12-13-2015

The Impact of Social Media Features on Teaching Presence in Communities of Inquiry

Michael J. Scialdone
State University of New York at Fredonia, michael.scialdone@fredonia.edu

Ping Zhang
Syracuse University, pzhang@syr.edu

The Impact of Social Media Features on Teaching Presence in Communities of Inquiry

Michael J. Scialdone
State University of New York at Fredonia
Michael.Scialdone@fredonia.edu

Ping Zhang
Syracuse University
pzhang@syr.edu

ABSTRACT

We examine which features of social media support teaching presence both in and outside of the classroom. Our findings have implications for both design and practice, showing that parsimonious communication tools (PCTs), liberal communication tools (LCTs), multimedia, and notifications support teaching presence. The affordances of these first two relate to immediacy, and hence, allow teaching presence to be expressed in different ways. Meanwhile, notifications allow for filtering incoming information, and thus, impact teaching presence holistically. Multimedia allows CoI members to embed more content and therefore, also have an overarching effect on teaching presence. The only social media feature noted to be conducive to expressing teaching presence inside of the classroom is PCTs.

Keywords

Social Media, Human-Computer Interaction, Teaching Presence, Community of Inquiry, Computer-Supported Collaborative Learning, Adaptive Structuration Theory

INTRODUCTION

Social media, defined as "Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User-Generated Content" (Kaplan & Haenlein, 2010, p. 61), are broadly used in teaching and learning, especially in higher-education (e.g. Aghili et al., 2014; Costa, Beham, Reinhardt, & Sillaots, 2008; Pampek, Yermolayeva, & Calvert, 2009; Robertson, 2008). Despite empirical and anecdotal evidence that social media increase student engagement, scant research looks at what it is *about* social media that potentially engages learners. That is, which *characteristics* of social media support educational interactions? Accordingly, instructors may not be sufficiently informed on which tools to use, or how to integrate these into their pedagogical strategies.

Drawing on the Community of Inquiry (CoI) framework (Garrison, Anderson, & Archer, 2000, 2010), we recognize the importance of *teaching presence* (i.e., instructional transactions) to an educational experience (Anderson, Rourke, Garrison, & Archer, 2001; P. J. Shea, Li, & Pickett, 2006) because first and foremost, the decision to utilize social media in higher education lies with instructors. Specifically, we examine which features of social media are able to convey teaching presence both in and outside of the classroom by asking:

- **RQ1: Which social media characteristics do members of a CoI use to express teaching presence?**
- **RQ2: How do these characteristics impact a CoI's actions?**
- **RQ3.1: How do these characteristics convey teaching presence to a CoI in the classroom?**
- **RQ3.2: How do these characteristics convey teaching presence to a CoI outside the classroom?**

CONCEPTUAL FRAMEWORK

Teaching Presence

First detailed by Garrison et al. (2000), the CoI framework assumes, as Garrison (2011) citing Dewey (1938) explains, "transactional communication is the defining component of the educational experience when students transform inert information passed to them from another and construct it into knowledge with personal application and value" (p.10). Therefore, when employing computing technologies in classes, the "educational experience" becomes inextricably linked to the technologies that students use to interface with data, transform it into information, and share it with others as knowledge. Teaching presence refers to communicative transactions related to the design of a course, and facilitation of learning activities (Anderson et al., 2001); and can be understood through three categories.

The first, *instructional design and organization*, is indicative of the macro-level structure of a course. Indicators of this are transactions that express setting curriculum, methods for participation in learning activities, establishing time parameters, establishing netiquette, and macro-level comments about the content of the course (Anderson et al., 2001; P. Shea et al., 2010). The next category, *facilitating discourse*, refers to emphasizing and encouraging "the focused and sustained deliberation that marks learning in a community of inquiry" (Anderson et al., 2001, p. 7). Specific indicators of this category are identifying areas of agreement/ disagreement, seeking consensus, acknowledgment and encouragement of student contributions, setting learning

climate expectations, prompting discussions, focusing (or refocusing) discussions, and summarizing discussions (P. Shea et al., 2010). The third category, *direct instruction*, has a micro-level focus that relies on pedagogical and instructional expertise, specific to course content (Anderson et al., 2001; Garrison, 2011). Transactions indicative of this category are presenting content and questions, providing valuable analogies, offering helpful illustrations, making clarifications, confirming understandings, diagnosing misconceptions, interjecting outside materials, and responding to technical concerns (Garrison, 2011; P. Shea et al., 2010).

Adaptive Structuration Theory

While we use the terms feature and characteristic synonymously, the term affordance is used to refer to actions (task, goals, activity, etc.) that a given feature allows (or disallows) a user to accomplish. Although each social medium has unique characteristics; it may also overlap or approximate the affordances of others. For example, connections that a user makes might be called "friends" on Facebook, or "followers" on Twitter. Whether one "friends" or "follows"; both represent a connection allowing exclusive interactions that could not otherwise exist. Similarly, numerous media allow users to group friends/followers. However, Facebook and Twitter call these collections "lists," while Google+ calls them "circles."

Looking at the feature-level allows us to conceptualize the phenomenon in a way that is unrestricted to a specific social medium. Yet, no strong theory exists to provide researchers with a typology of features. As a solution to this, DeSanctis and Poole (1994) proposed Adaptive Structuration Theory (AST), a reflection on the dynamic interplay between human actors, technology, and social structures. Some years later, Markus and Silver (2008) put forth an extended version (which we refer to as eAST) to clarify and refine some of AST's original concepts.

eAST assumes that technologies have characteristics which may be perceived and hence, used in a particular fashion based on who comprises a group of users. Accordingly, we can describe technology features as technical objects that have functional affordances for, and symbolic expressions to, a specific group based on their perceptions, experiences, and needs. **Technical objects** are "IT artifacts and their component parts" (Markus & Silver, 2008, p. 620) and can be tangible or abstract. But, they must be perceived. A technical object might be an entire information system, or *a specific feature* of that system. As technical objects can be repeatedly decomposed, functional affordances and symbolic expressions allow a researcher to calibrate the level of abstraction appropriate for a given phenomenon that is pertinent to the user group of interest. **Functional affordances** are not properties of a computing technology, but rather the possible goal-driven actions facilitated by a technical object for the specified group (Markus & Silver, 2008). It describes one half of a relation between these users and a technical object. The other half is described by **symbolic expressions**; "the communicative possibilities of a technical object for a specified user group" (Markus & Silver, 2008, p. 622). These are also not properties of technical objects, but rather represent the object's value and/or meaning to this user group (Grgecic & Rosenkranz, 2010).

In relation to this study, we examined which technical objects members of a CoI perceive in regard to teaching presence (RQ1), which action(s) do these facilitate (RQ2), and how these convey this type of presence inside the classroom (RQ3.1) and outside of it (RQ3.2). Our research model, based on Markus & Silver's eAST (2008), can be seen below in figure 1.

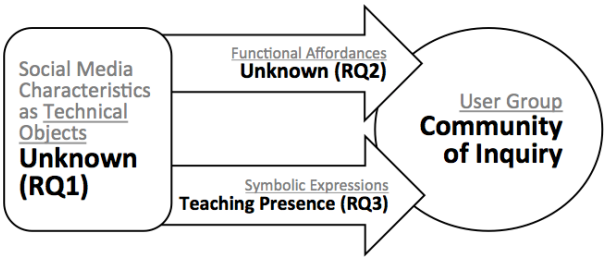

Figure 1: Conceptual Model Based on eAST

RESEARCH METHODOLOGY

As teaching presence is inherently interwoven within the context of our study, case study methodology allowed us an exploratory, yet rich understanding. We examined multiple cases across multiple courses that used social media to varying degrees. We chose 9 cases (bound by 9 students) from within two similar distance-based courses and one blended-learning course from a Master of Science in Library and Information Science (MSLIS) program and a Master of Science in Library and Information Science Social Media (MSLISSM) program at a School of Information Studies in the Northeast United States. As students from these programs have shared experiences and classes, they were an ideal bounding criterion. Data collection spanned multiple formats, including observations, digital artifacts, and interviews; while inductive and deductive content analyses were performed.

Data Collection

For blended courses, *observations* were important to understand and contextualize the teaching presence that occurred via social media during class periods; and conversations that continued outside of the class period. They also provided a sense of the dynamics between students, and between students and the instructor.

For both online and blended courses, we gathered *digital artifacts* in the form of transactions (whether these were on Facebook pages, tweets, etc.), that is, any other communicative, transactional content that might reflect presence. Typically in the CoI literature, presence was limited to text-based discussion boards; however as social media facilitate multiple types of communication content,

it would have been a disservice not to gather data in textual, audio, or video-based formats.

Conducting *interviews* allowed us to elicit data about the nature of students' educational experiences, and about connections between teaching presence and eAST. We conducted one interview with each instructor (three), and two with each student (minus one who did not respond for a follow up). With our first round of interviews, we tried to keep questions broad as to best understand what was important from the perspective of the students and instructors who used social media in their classes. A second round of interviews came following analysis of the first with questions, and was tailored to elicit additional data based on preliminary findings.

Inductive Data Analysis

We took dual approaches to our analysis: working from the ground up, yet simultaneously moving top-down; revisiting our findings and tailoring our analysis techniques as new insights were revealed. RQ1 required a primarily inductive approach as we sought to establish a sense of what CoI members perceived as technical objects. This analysis commenced shortly after data collection had begun, and ran concurrently. Inductive coding was performed only on interview data. We had adopted a grounded-theory approach for our pilot study, going through open, axial, and selective coding phases (Creswell, 1998; Strauss, 1987). The present study's analysis allowed us to apply and further refine our classification of social media features, and to recognize when we had reached saturation in data collection.

The students who comprised our case studies validated the existence of these features through reviewing our preliminary results. While these member checks overwhelmingly confirmed that our findings accurately represented their reality, a few minor details required fine-tuning (such as miscredited quotes, or a nuance in interpreting the intention behind a tweet).

Deductive Data Analysis

The work of Garrison and his colleagues (e.g., Garrison, 2011; Garrison et al., 2000) has been constructed around content analysis of text-based computer-mediated student discussion boards. Their work has documented the application and refinement of a coding scheme that contains indicators of unique aspects of teaching presence. We adopted this scheme due to its well-established use, mindful that these indicators might need to be expanded or refined over the course of our pilots. Due to space constraints, we direct our readers to Scialdone (2014) for further detail on our coding scheme adoption and implementation.

This paper's first author and a paid graduate student analyzed digital artifacts utilizing the aforementioned coding scheme. Both coders reviewed literature on teaching presence prior to this, and discussed it to ensure a shared understanding. As per recommended by several other researchers (e.g., Lombard, Snyder-Duch, & Bracken, 2002; Neuendorf, 2002; Rourke & Anderson, 2004), they each coded the same short set of data, and then met multiple times per week over the course of a month and a half to discuss coding decisions. Coding was done using qualitative data analysis software (ATLAS.ti), and the coders maintained a spreadsheet of agreements and disagreements from each meeting to monitor inter-coder reliability. They utilized Holsti's coefficient of reliability (C.R.) (Holsti, 1969) as it is a simple, yet common statistics to report on. It is as follows:

$$C.R. = 2m/ n1+n2$$

Where: m = number of coding decisions where coders agree
n1 = number of coding decisions made by rater 1
n2 = number of coding decisions made by rater 2

After three weeks, intercoder reliability was consistently between 70% and 80%; generally an acceptable standard.

FINDINGS

We present our findings organized by distinct technical objects (RQ1), which emerged as salient themes; noting associated functional affordances (RQ2); and the category of teaching presence expressed (RQ3). The first technical object of note is **Parsimonious Communication Tools** (PCTs), which provide the functional affordance to receive and/or send messages rapidly through restricting the girth of content. That is, the ability for *immediacy*. An example of a PCT might be the 140-character limitation in Twitter. Within the classroom, we found that that they were most often used in relation to the teaching presence category of facilitating discourse, particularly when it came to drawing in participants for electronic discussion as lectures or in-class activities were in progress. Yet, when it to transactions outside of the classroom, these PCTs were found to support direction instruction; usually in the form of referencing outside materials.

On the other side of PCTs, we identified the relevance of **Liberal Communication Tools** (LCTs) as technical objects with a corresponding functional affordance to send and receive lengthy content. These do not foster immediacy, but rather through a lack of it, were able to reflect instructional facilitation of discourse outside of the classroom. Specifically, LCTs provided indications of interactions that encouraged and reinforced student contributions; plus those that summarized discussions.

The remaining two technical objects emerged as supporting expressions of teaching presence in general, and in respect to transactions outside of the classroom. **Notifications** were found to provide the functional affordance of alerting CoI members, when transactional content became available. These might be recognized in the form of an auto-generated email, to an icon badge indicative of new activity is available to view, to a pop-up. Finally, **Embedded Multimedia** was revealed as a technical object that provides the functional affordance for students to send or receive rich information beyond simple text (i.e., audio, images, and video).

DISCUSSION

Below, we present a brief discussion about our findings in relation to practice and design. Due to space constraints, we recommend our readers review Scialdone (2014) for a more in-depth explanation of these implications.

Implications for Practice

An unexpected finding in our study was the continuum of immediacy as an affordance (PCTs and LCTs). Symbolic expressions of teaching presence through PCTs were different inside of the classroom than they were outside of the classroom. PCTs were identified as conducive to facilitating discourse in face-to-face classes when students utilized them as a "back-channel" during class time. Yet outside of the classroom, PCTs were used more so for direct instruction typically in the form of sharing links to relevant instructional material. LCTs, were not found to support teaching presence inside the classroom. Yet, outside the classroom, they gave CoI members sufficient transactional bandwidth to encourage and recognize meaningful discussions, and to provide summaries of the positive insight members expressed.

Accordingly, instructors may want to consider utilizing PCTs to encourage participation inside of the classroom; while appropriating LCTs to encourage participation and summarize discussions outside of the classroom. Furthermore, we suspect that instructors might find PCTs to be a quick and easy resource to push links about additional course content when their audience is not available face-to-face.

Multimedia as technical objects was identified as impacting teaching presence in general outside the classroom. One instructor was known for posting self-made videos in each learning module, which students reported as engaging. That is to say, they interpreted it as an expression of direction instruction; and that this encouraged their own interactions with the course. Additionally, the instructor explained that video afforded a forum for making comments about the course and setting expectations.

Finally, the practical application of notifications as technical objects that support teaching presence stems from concerns expressed about integrating too many different types of media tools into a course. As one student explained, "I may have missed a piece of communication that affects an assignment I am going to turn in and that makes students really nervous. So if there are 10 places I need to check, it becomes more and more likely I am going to miss something." This suggests that notifications are helpful to avoid missing important instructional discourse; and perhaps more generally, notifications might help to reduce information overload; thereby making everyone in a CoI more productive and efficient.

Implications for Design

This study makes a unique contribution to HCI scholarship regarding design qualities of social media which support discourse within a CoI. A survey by Zhang et al. (2009) that covered HCI research in IS from 1990-2008 reported that only 7 out of nearly 1800 papers analyzed addressed the topic of education. In light of the increasing expectation that higher education leverage up-to-date computing technologies (such as social media) for learning activities (CourseSmart, 2011; Moran et al., 2011), researchers in HCI have ample opportunity to make meaningful contributions to this domain through their unique expertise. This can help to provide insight about how people interact with technologies within educational contexts, and hence provide designers of educational technologies with guidelines as to how to best engage members in a CoI.

This research is a step in that direction. For example, providing technical objects in a learning management system that allow members in a CoI to customize notifications could be useful in that such may generally increase teaching presence. Meanwhile, ensuring that a training system has a mix of PCTs and LCTs could result in expressions of teaching presence that enhance member interactions, while also extending beyond designated, face-to-face meeting times.

Limitations

If one is to generalize from this work, he or she is advised consider the extent to which he or she believes our findings could be applicable to his or her particular context and situation. Future research will be needed to paint a richer and more holistic picture of how characteristics of social media will impact students' educational experiences. What we present here is intended to help educators and designers make informed choices by increasing their understanding of how social media may have an impact on teaching presence.

CONCLUSION

In this paper, we provided an overview of eAST as a guiding structure for our research methodology; and a conceptualization of teaching presence as symbolic expressions of interest within communities of inquiry. Through qualitative multi-case studies that adopted both inductive and deductive content analytic techniques; we explained that the features of social media that allow these expressions of teaching presence are parsimonious communication tools (PCTs), liberal communication tools (LCTs), multimedia, and notifications. The affordances of these first two relate to accomplishing (or restricting) immediacy, and hence, allow teaching presence to be expressed in different ways. Meanwhile, notifications allow for filtering incoming information, and thus, impact teaching presence holistically. Multimedia allows CoI members to embed more content and therefore, also have an overarching effect on teaching presence. Also, the only

social media feature noted to be conducive to expressing teaching presence inside of the classroom is PCTs.

REFERENCES

Aghili, M., Palaniappan, A. K., Kamali, K., Aghabozorgi, S., Sedigheh, and Sardareh, A. (2014) Unifying Informal and Formal Learning Environments: Educational Use of Social Network Sites through Implementing Community of Inquiry Framework. *International Journal of e-Education, e-Business, e-Management and e-Learning,* 4, 3, 191-196.

Anderson, T., Rourke, L., Garrison, D. R., and Archer, W. (2001) Assessing Teaching Presence in a Computer Conferencing Context, *Journal of Asynchronous Learning Networks*, 5, 2, 1-17.

Costa, C., Beham, G., Reinhardt, W., and Sillaots, M. (2008) Microblogging in technology enhanced learning: A use-case inspection of PPE summer school 2008, paper presented at the *2nd SIRTEL'08 Workshop on Social Information Retrieval for Technology Enhanced Learning*, Maastricht, Netherlands.

CourseSmart (2011) "Digital Dependence of Today's College Students Revealed in New Study from CourseSmart" *retrieved October 24, 2015* from http://www.coursesmart.com/media#pr34

Creswell, J. W. (1998) Qualitative Inquiry and Research Design: Choosing Among Five Traditions, Sage Publications.

DeSanctis, G., and Poole, M. S. (1994) Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory, *Organization Science,* 5, 2, 121-147.

Dewey, J. (1938), Experience and Education (60th Anniversary ed.), Kappa Delta Pi.

Garrison, D. R. (2011), E-Learning in the 21st Century (Second ed.), Routledge.

Garrison, D. R., Anderson, T., and Archer, W. (2001) Critical thinking, cognitive presence, and computer conferencing in distance education, *American Journal of Distance Education,* 15, 1, 7-23.

Garrison, D. R., Anderson, T., and Archer, W. (2010) The First Decade of the Community of Inquiry Framework: A Retrospective, *Internet and Higher Education,* 13, 5-9.

Grgecic, D., & Rosenkranz, C. (2010) Rethinking the Concept of IT Use, paper presented at the *Diffusion Interest Group in Information Technology (DIGIT)* St. Louis, MO.

Holsti, O. (1969) Content Analysis for the Social Sciences and Humanities, Addison-Wesley.

Kaplan, A. M. and Haenlein, M. (2010) Users of the World, Unite! *The Challenges and Opportunities of Social Media. Kelly School of Business*, 53, 59-68.

Lombard, M., Snyder-Duch, J., and Bracken, C. C. (2002) Content Analysis in Mass Communication: Assessment and Reporting of Intercoder Reliability, *Human Communication Research,* 28, 4, 587-604.

Markus, M. L. and Silver, M. S. (2008) A Foundation for the Study of IT Effects: A New Look at DeSanctis and Poole's Concepts of Structural Features and Spirit, *Journal for the American Society of Information Science*, 9, 3/4, 609-632.

Moran, M., Seaman, J., and Tinti-Kane, H. (2011) Teaching, Learning, and Sharing: How Today's Higher Education Faculty Use Social Media, Pearson Learning Solutions.

Neuendorf, K. A. (2002) The Content Analysis Guidebook, Sage Publications.

Pampek, T. A., Yermolayeva, Y. A., and Calvert, S. L. (2009) College Students' Social Networking Experiences on Facebook, *Journal of Applied Developmental Psychology,* 30, 227-238.

Robertson, I. (2008) Learners' Attitudes to Wiki Technology in Problem Based, Blended Learning for Vocational Teacher Education, *Australiasian Journal of Education Technology,* 24, 4, 425-441.

Rourke, L., and Anderson, T. (2004) Validity in Quantitative Content Analysis, *Educational Technology Research and Development*, 52, 1, 5-18.

Scialdone, M. (2014) Understanding The Use and Impact of Social Media Features on The Educational Experiences of Higher-Education Students in Blended and Distance-Learning Environments (Unpublished Dissertation), Syracuse University.

Shea, P. J., Li, C. S., and Pickett, A. (2006), A Study of Teaching Presence and Student Sense of Learning Community in Fully Online and Web-Enhanced College Courses, *Internet and Higher Education*, 9, 175-190.

Shea, P., Hayes, S., Vickers, J., Gozza-Cohen, M., Uzuner, S., Mehta, R., Valchova, A., and Rangan, P. (2010) A re-examination of the community of inquiry framework: Social network and content analysis. *Internet and Higher Education*, 13, 10-21.

Strauss, A. L. (1987) *Qualitative Analysis for Social Scientists*, The Press Syndicate of the University of Cambridge.

Zhang, P., Li, N., Scialdone, M. J., and Carey, J. (2009) The Intellectual Advancement of Human-Computer Interaction Research: A Critical Assessment of the MIS Literature (1990-2008), *AIS Transactions on Human-Computer Interaction*, 1, 3, 55-107.