

Factors Influencing Online Communication Style in LIS Problem-Based Learning

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Abstract

Using Clark's theory of common ground as a heuristic device, this article systematically examines the responses of two significantly different LIS students to the resources for communication afforded by web-based collaborative software. Social factors such as professional background, prior experience and relationships, learning style preference, and learning environment are also discussed. The communication occurred during an intensive, one-semester online action research course. The findings indicate that the factors that influence online communication styles are complex and multidimensional. Further research and deeper analyses of how technological and social factors interact to influence communication effectiveness are needed to support the development of innovative, flexible, and responsive technology-supported learning environments to meet the needs of growing numbers of LIS distance learners.

Keywords: affective dimension, distance education, library and information science, online communication, web-based learning, wiki

Introduction

While much of the emphasis in earlier years of web-based education was on developing systems to meet the demand for distance education (DE) that accompanied Internet accessibility, web designers and educators are now increasingly focused on developing appropriate pedagogical models and teaching strategies that leverage the interactive capabilities of the web.¹ One of the pioneers of DE in library and information science education, Florida State University's School of Information Studies, developed its own courseware and pedagogical models centered on interaction, exploration, individualization, and collaboration.² Collaborative and community-based models critically rely on effective online communication.

What are the factors that influence effective online communication? This article examines the technological and social factors that influenced differences in the communication styles of two library and information science (LIS) graduate students. The case study upon which this article is based examined the learning processes in an online action research course facilitated by the author.³ The two students, Ruth and Sarah (pseudonyms), studied action research and applied their knowledge to independent research projects. The purpose of the study was to examine the co-construction of knowledge and how affect and interaction influence participant understanding of action research. The analyses of learning focused on reflection as an individual critical thinking process and co-reflection as an intersubjective, social critical thinking process. The evidence was derived from course work, pre- and post-course interviews, final questionnaire, and server logs.

John Dewey defined reflective thought as “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends.”⁴ Guided by Dewey, Boud et al.⁵, and Mason⁶, I identified these key aspects of reflection in the student data: (1) being confronted with a challenging question or situation, (2) dealing with feelings related to the challenge, (3) returning to the challenging experience, (4) reframing perspective, (5) making a leap of thinking, (6) integrating the new knowledge cognitively and affectively, and (7) identifying implications for future action.

Co-reflection is a collaboratively undertaken reflective process that involves intellect and affect as individuals together explore their experiences and reach new intersubjective understandings and appreciations.⁷ Through co-reflection, they collaboratively weigh reasons, arguments, and supporting evidence and examine alternative perspectives to achieve a clearer understanding by drawing on collective experience.⁸ The goal is to transform frames of reference to make them better guides for action. The affective dimension plays an important role in co-reflection, because effective participation in co-reflection requires emotional maturity (intrapersonal and interpersonal) as well as clear thinking.⁹

The action research course activities included weekly meetings, weekly readings and assignments, email exchanges, journaling, and conducting a research project. The online workspace was created using wiki-style collaborative software, with added email and chat programs. The course provided four media for communication: (1) wiki pages, (2) email, (3) chat sessions (twelve), and (4) face-to-face class meetings (four). One valuable function of the wiki website was its use in synthesizing and integrating conversations and interactions that took place in different media. Chat summaries on wiki pages provided a record of the knowledge that was co-constructed through collaborative learning in the chat sessions. Important questions, issues, and points raised in email messages were also summarized on wiki pages. In addition, selected journal entries submitted via email were also posted as wiki pages. In this way, the wiki was the central repository of knowledge about action research as well as individual and collaborative learning paths.

Using these simple, flexible tools, the graduate students created a substantial body of online written artifacts describing their learning. This article investigates the students' online communication styles and the technological and social factors that influenced differences in style.

Technological Influences on Communication Style

Currently, web-based collaborative learning relies predominantly on written communication, which is significantly different from face-to-face (F2F) communication. Writing is often perceived as artificial, compared to the give and take of the spoken word. According to Ong, print “technologizes” the word and in so doing provides distance, encouraging us to be reflective, precise, and analytical.¹⁰ Ong describes electronic communication as “secondary orality,” a self-consciously informal style. In online

learning, oral communication is replaced by secondary orality, with its characteristics of immediacy and distance, spontaneity tempered by reflective consciousness.

Herbert Clark’s theory of common ground provides a theoretical basis for understanding secondary orality through the inhibiting and enabling factors characteristic of different types of communication media.¹¹ The theory posits that common ground must be established for effective communication to occur. One of the key tenets in grounding is least collaborative effort. According to Clark, there are eight “constraints” or enabling factors that affect communication efficiency: (1) copresence, (2) visibility, (3) audibility, (4) cotemporality, (5) simultaneity, (6) sequentiality, (7) reviewability, and (8) revisability (see Table 1).

Table 1. Clark’s Communication Constraints (Enablers)

Enabler	Description
Copresence	Communicators share the same physical environment.
Visibility	Communicators are visible to each other.
Audibility	Communicators can hear each other.
Cotemporality	Communicators receive messages at roughly the same time they are produced.
Simultaneity	Communicators can send and receive at once and simultaneously.
Sequentiality	Communicators’ conversation turn taking cannot get out of sequence.
Reviewability	Communicators can review each other’s messages (i.e., messages are permanently recorded).
Revisability	Communicators can revise messages for each other (e.g., letters, email).

Face-to-face communication allows the greatest communication efficiency because it provides the richest array of enablers, while email and letters are the most restrictive because they only allow for reviewability and revisability.

Grounding also entails costs, including: (1) formulation costs – effort needed to formulate utterances, (2) reception costs – effort needed to process communication received, (3) understanding costs – effort needed to understand communication, (4) start-up costs – effort needed to start up new communication, (5) delay costs – adverse effects of delaying one’s communication, (6) speaker change costs – effort needed for turn taking, (7) display costs – effort needed to gesture and indicate, and (8) fault costs – adverse effects of committing a communication mistake (see also Table 3). The type of medium influences the techniques used to compensate for the costs of grounding.

The concept of secondary orality and Clark’s enablers and costs provide a basis for examining the technological factors influencing differences in the students’ communication styles. The four media used in the course offered different configurations of enablers and costs (see Table 2). Though more costly in most areas, the online media allowed reviewability and revisability, which supported learning in ways not possible under normal F2F conditions.

Table 2. Course Media, Enablers, and Costs

Medium	Enablers	Costs
Wiki pages	Reviewability, revisability	Higher costs in most categories, but paying higher formulation costs may have resulted in lower reception and understanding costs
Email	Reviewability, revisability	Higher costs in most categories, but paying higher formulation costs may have resulted in lower reception and understanding costs
Chat sessions	Copresence, cotemporality, sequentiality, reviewability	Higher costs in all categories compared to F2F, but with the added benefit of reviewability
Face-to-face meetings	Copresence, visibility, audibility, cotemporality, simultaneity, sequentiality	Costs minimal; however, lacking in reviewability and revisability

The students used the communication media in different ways and with somewhat different preferences. Although few in number, the F2F meetings were highly valued by both students. However, the students' attitudes toward online communication differed significantly. Table 3 indicates the relatively higher costs of grounding for Ruth, as well as Sarah's ability to turn some costs into benefits.

Table 3. Comparative Costs of Grounding Online, by Student

Type of Cost	Nature of Costs	Ruth	Sarah
Formulation costs	<ul style="list-style-type: none"> • Time & effort are needed to formulate/reformulate utterances, depending on complexity of utterance and familiarity of object/concept referenced. • Higher formulation costs may result in lower volume of communication. 	<ul style="list-style-type: none"> • On chat: "I often find giving an answer on demand difficult, as I need to hear it out, revise it, think about it again and then share it. I often write a message, erase it, write it again, erase it ... the discussion has already moved on ... so I erase it." (4/18/04) • Total volume of online course activity: 37,940 words. 	<ul style="list-style-type: none"> • On chat: "I was nervous about the chat initially. I was apprehensive of the technology. Once we got into the discussion, all my worries fell to the side. I could feel the wheels of my brain turning with the questions and observations." (1/27/04) • Total volume of online course activity: 75,420 words.
Reception costs	<ul style="list-style-type: none"> • Listening is generally easy and reading harder, though it may be easier to read than listen to complicated instructions or abstract arguments. • It also costs to wait while a speaker produces a turn. 	<ul style="list-style-type: none"> • Online communication without F2F verbal & nonverbal feedback was upsetting: "I actually had a class that was totally online, without F2F it was like shell shock." (12/5/03) • On email: "Prompt responses were helpful in alleviating anxiety of not knowing." (6/12/04) 	<ul style="list-style-type: none"> • On chat: "Because of the pace of the chats (sometimes I felt like I was waiting, waiting, waiting for the answers), I could go back into the article and see, 'Oh, I kind of missed that in the reading,' whereas F2F I might have been a little embarrassed to do that like it'd be

			disrespectful, or we'd be going faster so I wouldn't have a chance." (6/17/04)
Understanding costs	<ul style="list-style-type: none"> • It is more costly to understand certain words and concepts than others, regardless of medium. Costs can be compounded when contextual cues are missing. 	<ul style="list-style-type: none"> • On chat: "Being a picture person who needs to 'see' what's happening, what I do to accommodate is to write down key comments or ideas. I may doodle, draw a picture, a metaphor of a key idea, while I wait for responses." (4/18/04) 	<ul style="list-style-type: none"> • On chat: "The chat did help me understand what was important in the reading, how it connected to what we're doing, how we can use this information." (6/17/04) • On reviewability in chat and email: "I liked that I could go back to read our chats, return to email 'discussions'" (7/7/04).
Start-up costs	<ul style="list-style-type: none"> • Costs of starting up a new discourse are minimal F2F, more difficult in chat which lacks gesture, and most difficult by email where the effort of getting online and starting and composing the message may cause delay. 	<ul style="list-style-type: none"> • Total number of days the wiki was accessed: 55 • Total number of emails sent to instructor: 51 • Ruth's lower totals may be due in part to discomfort with online media. 	<ul style="list-style-type: none"> • Total number of days the wiki was accessed: 92 • Total number of emails sent to instructor: 103
Delay costs	<ul style="list-style-type: none"> • In cotemporal communication, delay costs are high, as gaps before starting a conversational turn may be interpreted as dropping out of the conversation or disagreeing. Speakers may utter words that have to be revised. In email, delay costs are nil but often trade off with formulation costs. 	<ul style="list-style-type: none"> • On chat: "When responses from other chatters took longer than I had anticipated, I often jumped to the conclusion that they either didn't understand what I was trying to say or didn't agree" (5/14/04). • On chat: "Difficult for me to sit still between responses; felt pressure to respond quickly." (6/12/04) 	<ul style="list-style-type: none"> • Delay costs were not mentioned.
Speaker change costs	<ul style="list-style-type: none"> • F2F turn taking is easy to arrange through gesture. In chat, speaker change may need to be signaled by a written convention. Turn taking more ambiguous with email. • Due to high speaker change costs, people may do more within a turn. • Frequency of online access affects time between turn taking and number of messages. 	<ul style="list-style-type: none"> • Total number of days the wiki was accessed: 55 • Total number of emails sent to instructor: 51 • Less frequent access may be due to discomfort with online media. 	<ul style="list-style-type: none"> • Total number of days the wiki was accessed: 92 • Total number of emails sent to instructor: 103 • Wrote long email messages encompassing many thoughts and feelings.
Display costs	<ul style="list-style-type: none"> • F2F, it is easy to point to, nod at, or present an 	<ul style="list-style-type: none"> • Compensated for the lack of gestures by limiting her 	<ul style="list-style-type: none"> • Compensated for the lack of gestures with explicit

	object, and easy for listeners to indicate understanding. In media without copresence, gestures are costly, severely limited, or out of the question.	communication to brief, carefully constructed expressions to present thoughts and feelings. • Sent the instructor about 14,550 words via email and journals.	verbal descriptions and open expressions of thoughts and feelings. • Sent the instructor about 36,990 words via email and journals.
Fault costs	• Costs associated with producing an utterance fault or mistake. Faults can lead to misunderstanding or make speaker look bad. To avoid paying fault costs, speakers may elect to pay more in formulation costs.	• Carefully composed and recomposed thoughts before posting to avoid fault costs.	• To forestall or mitigate possible fault costs, Sarah offered alternative interpretations in her original formulations “to anticipate what my audience is thinking and address all possible questions/criticisms”

Clearly, Ruth was more negatively affected by the costs of grounding online than Sarah, particularly during chat sessions. One inhibiting factor was fear of being misinterpreted: “I was very cautious about the way I wrote things, because it was open to interpretation” (12/8/03). However, the use of the asynchronous media allowed her to take the time she needed to process, reflect, and revise her writing. Here, the reviewability and revisability of the wiki pages and email were advantageous.

Sarah appeared to overcome the communication barriers caused by lack of visibility and audibility through explicit verbal descriptions. In all media, she tended to use a spontaneous, conversational style. She was self-aware and clearly stated her thoughts, feelings, and motivations. Sarah commented that the online media might even have encouraged her to be more frank and open than she would have been in a F2F classroom environment.

Social Influences on Communication Style

While grounding theory provides insights into the basic building blocks of human-to-human interaction mediated by collaborative software, it does not provide tools to understand the social and affective dimensions that go beyond the technological. Ruth’s difficulty expressing herself through writing online may have been due to social factors as well as technological ones. First, she had been an elementary school teacher whose specialty was teaching music. Second, she and the instructor had not had a relationship prior to the action research course. Third, she was a self-professed visual learner who had difficulties using the text-based software. She felt pressured and uncomfortable at having to write quickly during the chat sessions. Midway through the course, she requested graphic representations of the research process to aid her understanding.

Sarah’s comfort and fluency with the text-based online tools may have been due to similar factors. First, as a high school English teacher prior to entering the LIS program, her expertise was teaching good writing skills. Second, she had developed a trusting relationship with the instructor in a previous course. Third, she had no previous

experience with a fully online course and presumably no preconceptions about how online course communication should be conducted. Thus, she could freely adapt the F2F interpersonal strategies that she had used successfully in her teaching and learning. Although Sarah appeared to be at ease online, one of her final course comments indicates that the costs of grounding had taken their toll: "I just felt like I don't want to face another computer again. So that's kind of funny. So even though I can do it, and I liked the class that way, I just feel tired of the computer" (6/17/04).

In addition to the students' personal backgrounds, the learning environment of the course influenced styles of communication. The instructor's primary goal was to provide a learning environment that encouraged self-awareness, questioning, critical thinking, and risk taking. The instructor's tasks included setting the learning outcomes, providing a framework for activities and assessment, helping students monitor their learning processes, and assisting them in achieving their own goals within the framework.

Part of the effort to achieve these goals was providing scaffolds as needed. This was well supported by the flexibility of the wiki-style software. In addition, through email the instructor provided individualized responses to evolving learner needs through coaching and mentoring. Affective aspects and interpersonal strategies to motivate, guide, encourage, and support the students were critical aspects of the mentoring.

Open communication and emotional visibility online encouraged relationship building, which supports co-reflection and the risk taking that action research sometimes demands. A fundamental factor that affects openness is attitude toward online communication. For Ruth, online media were initially a barrier to her learning. The lack of immediate, visual, affective feedback denied her the reassurance that she had been understood. After realizing that her discomfort in a previous online course was blocking her ability to use the chat medium effectively, she took a more positive attitude: "In order for any real change to begin, I had to admit my insecurities about communicating in chat" (5/14/04).

Sarah's openness and emotional visibility in the email exchanges with the instructor were crucial for relationship building. Her communication throughout the course was characterized by openness, honesty, visibility, empathy, humility, gratitude, and the inseparability of the cognitive and affective dimensions of learning. Sarah asked questions and gave context when she was confused or needed help. She gave immediate positive feedback when the instructor took action that was helpful for her learning. She "thought out loud" when she wrote her emails or journals, helping the instructor see more fully and clearly her thinking processes and emotional reactions. She examined herself and admitted to fears and weaknesses when she found them. By being expressive and detailed, she made herself visible to the instructor both cognitively and affectively and provided opportunities for the instructor to give cognitive and affective support.

An important part of building relationships that support learning and co-reflection is that students feel valued as learners. Ruth's expression of her needs as a visual learner provided the opportunity for the instructor to learn from Ruth how to better support visual learners online. Changes in content and website presentation were made to accommodate

Ruth's learning style. In her final interview, Ruth noted: "As far as the comment on the wiki, it was really, really good. It was uncluttered. It was organized. You [instructor] did a really good job of adapting the format as we went along. I could see that you were really trying to make the learning happen, to make it as easy as possible" (6/12/04).

Both students stressed the importance of feeling valued as learners. Ruth wrote, "By allowing students to learn through methods they are comfortable with, we acknowledge that how they learn is important. I experienced this firsthand as a telementee, as additional visual material was added to the instructional Web page. It affected me cognitively and emotionally. I now not only had a mental picture that I could refer to, but the feeling of being acknowledged transformed into increased motivation and a desire to learn more" (5/14/04). Sarah noted, "As a student, I appreciated your [instructor's] encouraging, patient, supportive role. You gave me space to flounder yet you also gave me words of support when you saw that I needed them. While you probably saw some glitches and errors in my process, you gave me space to learn at my own pace. I felt valued as a student and I think this is crucial for learning to occur" (7/17/04).

Conclusion

Using Clark's theory of common ground as a heuristic device, this article has systematically examined the responses of two significantly different LIS students to the costs and constraints to communication posed by web-based collaborative software. Social factors such as professional background, prior experience and relationships, learning style preference, and learning environment were also discussed. These findings indicate that the factors that influence online communication styles are complex and multidimensional. Further research and deeper analyses of how technological and social factors interact to influence communication effectiveness are needed to support the development of innovative, flexible, and responsive technology-supported learning environments to meet the needs of growing numbers of LIS distance learners.

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