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Rethinking online discourse: Improving learning through discussions in the online classroom

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Abstract As colleges continue to expand online offerings, student participation within courses should be assessed to ensure that teachers can best implement effective, responsible lesson plans. This study examined discourse in an online classroom in order to gauge student participation by observing student-to-student and student-to-instructor exchanges within the discussion board. Classroom discourse was analyzed using Stahl's computer supported collaborative learning methodology. Data was collected to assess development of classroom dialogue through group collaboration, and to determine whether participants were interpreting previous posts and contributing to the development of the discussion topic. This study shows that students within the online classroom were able to construct deeper meanings in classroom dialogues through thoughtful and personal contributions, thereby reaching new understandings through collaborative discussion. This study contends that through insightful planning and guided responses, instructors can manage online classroom discussions to better direct student communications in order to improve collaborative learning and knowledge construction.

Keywords CSCL · Collaborative · Knowledge construction · Socio-cognitive · Dialogue · Online discourse

1 Introduction

The digital world with which we interact on a daily basis in a variety of forms may be changing both the nature of and how we define social interaction as well as classroom learning. As more and more college courses are converted into online offerings, the

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question of how educational curricula may be affected by this redefinition of learning must be addressed. As learning shifts to online instructional venues so, too, must our understanding of digital environments shift to meet the needs of online students, particularly because this venue does not usually allow face-to-face interactions between instructors and students. In fact, Coiro (2003) has argued that new pedagogies must be adopted as new technologies become available. Instead, interaction between students and instructors necessarily often relies upon collaboration through discussion boards where ideas are exchanged through posts rather than synchronous dialog.

There are key concerns related to the trend toward online class offerings that should be considered with regard to student learning. For instance, teachers must be focused on adopting the most beneficial elements of online discussion boards in aligning pedagogy and the enhancement of instruction, including leveraging those strengths available through such tools with respect to student learning and class participation. As classroom communications and instructional activities influence student attitudes and perspectives on learning in online environments, instructors in the online space must continue to reshape instruction and focus on student motivation, improved critical thinking, and collaborative learning to ensure academic success (Burgess 2009; Capper 2001; Liaw 2008; Vacca 2006).

From a practical standpoint, expanding college course offerings through networked or online venues makes sense with respect to cost effectiveness (Bauer 2012; McMahon 1997). Not only does an online course design make classrooms available to a larger potential student body (Chaika 1999), but digital educational materials are also much less expensive to produce and maintain (Keengwe et al. 2014; McMahon 1997). The incorporation of networked technology into the postsecondary classroom thus seems a necessary development from the perspective of administrators and instructors interested in the cutting edge of technology and curricula, as well as in expanding the student base from which colleges can draw.

This study examined classroom discourse in on online learning environment in order to gauge the level of student participation by analyzing student-to-student and student-to-instructor exchanges in an online classroom discussion board. The questions that guided this study were: 1) how instructors could assess student interactions within an online classroom to ensure that class discussions are effective and enhance student knowledge construction and community building, and, 2) whether and to what degree instructors in online courses could impact how students' engagement with one another in classroom discourse. To ensure online instructional interactions between students and students-to-instructor are most effective, I contend that through insightful planning and guided responses, instructors can manage online classroom discussions to improve collaborative learning and knowledge construction.

This paper will present relevant literature regarding online interactions and social knowledge construction that impacts learning in the classroom. I will then present the methodology used in this research, particularly illustrating one aspect of Stahl's (2006) larger computer supported collaborative learning (CSCL) process. I will proceed into the discussion of my analysis procedures, examining the basic forms of online discussion posts that either contribute to an ongoing discussion, and hence knowledge construction, or demonstrate a lack of participation. I then conclude with my discussion on the study and present suggestions for further research.

2 Literature review

Online course offerings have become increasingly commonplace, and higher education has seemingly adopted this format to take advantage of the benefits these courses provide: access to a wider student base and flexibility of offerings (Coole and Watts 2009; Keengwe et al. 2014; Upton 2006). In practice, while traditional classrooms involve discussions that occur in real-time and require students to be physically in the same location, lessons in the online classroom can occur over extended periods of time without the benefit of proximity cues (e.g., body language, intonation, etc.) that enhance meaning conveyance typical in face-to-face discourse (Coole and Watts 2009; Dennen and Wieland 2007). The use of the internet, however, has been shown to support collaborative learning by providing instructors leverage in socio-cognitive scaffolding through classroom discussions and thus allowing the classroom to function as "self-improving communities" (Coole and Watts 2009, p. 22). In other words, online classrooms can be designed to investigate intricate and in-depth issues and tasks just as a traditional on-campus class discussion might.

While instructors in online classrooms may not physically meet their students, they can become *learning facilitators*, a resource to help otherwise anonymous students engage in dialogue and grow to trust one another (Coole and Watts 2009). Instructors can, in turn, assist students in developing social and cognitive skills to aid them in learning. Correspondingly, instructors must be attentive to student activities, as students must feel their efforts in group activities have value and purpose (Kirschner and Erkens 2013). Acts of purposeful collaborative constructivism allow students to both construct knowledge within the online classroom community as well as retain that knowledge (Barbosa et al. 2004; Coole and Watts 2009). Thus, while participants in online classrooms are physically separated across time and place, students and teachers are still able to create a learning community and co-construct knowledge that is important to their learning and academic achievement (Yim 2011).

The extant scholarship reviewed for this study focused on investigations of one or two specific classrooms to analyze online discourse. Because this study is interested in pre-service teachers, a number of similar investigations that examined the discourse of teachers-in-training have also been included (Coole and Watts 2009; de Leon et al. 2010; Dennen and Wieland 2007; Ferdig and Roehler 2004; Liang et al. 2009; Yim 2011). In two cases, studies examined both synchronous and asynchronous classroom discussions (Schallert et al. 2009; Yim 2011), comparing how students engaged in discourse in the differing mediums with the goal of improving knowledge construction within the class.

2.1 Power in classroom discourse

The relationship between power and language use has figured into classroom discourse research. In the case of online classrooms, Dennen and Wieland (2007) investigated the role of the instructor, and whether the instructor was viewed by students as a facilitator or a co-participant. Interestingly, while the instructor believed himself a co-participant, the data suggested the instructor was not viewed this way by the students. The instructor, after all, remained the instructor, and so was understood by students as retaining certain power in the classroom. Candela (1999) examined the extent to which

direct instruction by the teacher inhibited students from engaging in classroom power-sharing, thus inhibiting their creativity. What Candela (1999) found, however, was that both students and teachers can leverage direct instruction to gain a level of power for determining the direction of learning. Similarly, Ferdig and Roehler (2004) noted that supporting student ownership of classroom discussions can promote student learning. This claim was further expounded by Lapadat (2003), who noted that a constructivist approach to online discussions can position students as both knowledgeable and, in some ways, experts in the topics they discuss, particularly when these discussions allowed students to engage in experiences and personal learning. Further, de Leon et al. (2010) found that when students were given both the opportunity to share and learn from one another, this provided for a dispersion of power roles across the class and strengthened the community in which students and teacher were situated. When allowed to share power with the teacher in the classroom, students become motivated to participate and to learn, which in turn helps develop classroom discussions and knowledge construction (Xin and Feenberg 2006). Also of interest is a study by Yim (2011) who combined the power roles and knowledge construction with L2 learners and the roles they adopted in such online communities.

In the online course, instructors are a removed entity in the classroom, a distant figure who posts assignments, reviews work, and communicates via text messages. When an instructor stands at the front of a class, ownership and power in the room is obvious; however, in the online class, this power becomes more distributed, a shared commodity between all members of the classroom, instructor and students alike. This phenomenon is emphasized when an online class utilizes a discussion forum where all classroom participants contribute to learning (Candela 1999; Ferdig and Roehler 2004). And while the course instructor may retain overall ownership of the virtual classroom, primarily by establishing expectations and creating assignments and discussion prompts, the direction of interactions are often controlled by the students who carry out the discussion, thereby providing them with a level of control and power in the class that may not be typical of the traditional classroom (Coole and Watts 2009). Online discussions can help build stronger relationships between classroom participants, whether student-to-student or student-to-instructor, as well as help develop student aptitude with analyzing and critiquing of information (Ferdig and Roehler 2004; Williams et al. 2001). Additionally, online discussions can help build a strong student-learner community through the sharing of knowledge, experiences, and failures as well as successes (de Leon et al. 2010). With this in mind, it becomes even more important that instructors are able to measure the contributions and deeper learning of the students, regardless of how many posts they may make. With the understanding that discussions are rarely held in real-time, their asynchronous nature demands that instructors consider refocusing assessments to maximize course discussions to improve student collaborative learning and knowledge construction (Coole and Watts 2009).

2.2 Knowledge construction

Like traditional face-to-face classrooms, online classrooms are about learning communities and knowledge construction about a given topic and within the context of the course. How and why this knowledge is constructed, and whether knowledge is actually being constructed by the students, are questions of paramount importance to

education and learning. If an online classroom cannot engage students and cannot meet the goals of the course, what level of success has the course achieved?

Both Coole and Watts (2009) and Ferdig and Roehler (2004) studied how students processed and evaluated course discussion information, and how they worked together to solve problems and make decisions. Such online discussions can be involved and robust, and the use of discussion forums can enhance interactivity in the class and aid in the construction of knowledge (Ferdig and Roehler 2004; Johnson and Johnson 2000; Keengwe et al. 2014; Lapadat 2003). Lapadat (2003) found that online discussions may begin in simplistic interactions and illustrations, but can develop into deeper discussions about social processes and philosophies regarding educational systems. Through such deeper discussions, the community of learners within the classroom can integrate their own knowledge, experiences, and successes and thereby enhance learning among all members of the community (de Leon et al. 2010). In fact, one study (Schallert et al. 2009) found that online, asynchronous discussions were more likely to encourage students to share experiences and ideas than were face-to-face traditional classroom discussions.

Liang et al.'s (2009) analytical method categorized online discussions into three groups: *consensual*, where one discussant drove the discussion while others provided minimal input; *responsive*, where at least two discussants drove the discussion; and, *elaborative*, where all members contributed to the discussion. They determined that elaborative discussions were considered more constructive as all members were engaged in knowledge construction within the community of learners. Such indicators help determine whether or not students, either as a group or individually, are engaged in knowledge construction (Dennen and Wieland 2007; Ferdig and Roehler 2004). When we recall Dennen and Wieland's (2007) study where the instructor considered himself a co-participant, it is interesting to note that in cases where the instructor establishes himself as a peer in the online classroom and presents issues for discussion that allow for shared knowledge construction, students are more likely to engage in discussions within the classroom.

Ferdig and Roehler (2004) found that the number of responses in an online discussion did not necessarily correlate to the learning value of the discussion. Rather, a discussion that involved many participants, where knowledge was constructed communally, was more critical to learning than simply viewing response numbers. In more intricate, constructivist discussions, students learned to develop positions and issues confronting them, and learned to develop complex views on teaching practices. Dennen and Wieland (2007) also observed similar issues in their study noting that online discussions can initially give a "false sense of actual conversation or dialogue" (p. 2). As online discussions are primarily presented in threads, that is, inputs which are linked to previous posts, and are asynchronous, these can be mistaken for discussion inputs when, in fact, participants may not be fully versed in the entire discussion. Such responses may not actually be part of the conversation, but rather be individual responses to one aspect of the discussion. Threaded messages and responses do not automatically represent a conversation, even though they may provide a sense, even an illusion, of a conversation. Asynchronous interactions may, in fact, be nothing more than a collection of individual and isolated comments written over a span of time and not seen by every member of the conversation (Dennen and Wieland 2007; Nofsinger 1999). And while such disconnects may be obvious when reviewed at a later time, in

the moment of the discussion, deeper meaning construction may have been lost, thereby creating the possibility that the discussion does not achieve the success the instructor expects.

Rourke and Kanuka (2007) found that in some cases students did not view discussions as a venue for critical discourse. In fact, some students viewed responses not as contributions to a communal discussion, but rather as personal attacks. Additionally, some students considered classroom discussions as merely an irritating and unnecessary technique used by the instructor to accumulate points toward a grade. In such cases, knowledge construction would be minimal and less than satisfying for both students and instructors. Rourke and Kanuka (2007) presented three practices that may offset these appearances and attitudes by students: 1) well-defined roles for all participants, 2) well-designed activities for the classroom, and 3) assessing students' participation based upon effort and engagement.

Cooperative classrooms that use online discussions can be compared to a complex social system in which small groups of participants interact, dividing learning tasks and assignments among participants to deal with a multifaceted nature of issues presented as opposed to problem-solving with the intent of finding a single, correct answer. In such classrooms, instructors would serve more as guides to help students construct knowledge as members of a group (Coole and Watts 2009; Keengwe et al. 2014). The instructor, then, becomes more of a facilitator than a dispenser of information, a guide in a learning process where students join into a discussion with the purpose of discovering knowledge and sharing experiences. Learners are expected to develop a social sense of participation in order to work cooperatively to complete learning tasks, and therefore take on varying roles in this process (Coole and Watts 2009). This "communal constructivism" (Coole and Watts 2009, p. 17) becomes the vehicle for students to construct knowledge in their own way within the online asynchronous context, working as a team to build and retain information (Barbosa et al. 2004; Coole and Watts 2009; Dennen and Wieland 2007).

Simply because technology allows for discussions in the asynchronous classroom, however, does not automatically mean that students are engaged in the learning process. Because students are removed from direct proximity of the instructor, the telltale signs of disconnection may not be readily obvious. Failures in the learning process can occur for many reasons, including a lack of participation or motivation on the part of the students or instructors, and even issues regarding effective communication abilities, whether these stem from a lack of experience with technology or a lack of computer or internet availability (Dennen and Wieland 2007). More importantly, while classroom discussions within forums are typically required in online classes, an instructor cannot assume that a student is engaged and participating in deeper learning simply because he has posted messages (Dennen and Wieland 2007).

2.3 Discussion artifacts

Conversations typically revolve around an artifact of some form, defined as a central idea or object, such as a story or article, which is the topic of the discussion (Stahl 2006). Artifacts can be viewed as "boundary objects" (Bowker and Star 2000) that allow for perspectives and positions to be shared across boundaries of communities or groups. These artifacts can be either cognitive or linguistic constructions, and are used

by collaborative learning communities. As such, artifacts must be fully understood by all members to ensure they are meaningful concepts allowing for shared knowledge construction. In order to evaluate acts of meaning construction, contributions to the discussion must be evaluated and interpreted for member understanding (Stahl 2006). Member understanding is conveyed when members strive to make visible their own conceptualizations of an artifact, and thereby ensure that others will likewise gain an understanding of their perceptions. In this way, members work toward shared understanding and meaning rather than enhancing confusion by holding to varying interpretations of the artifact. In short, by opening communications and clarifying understandings, members of the learning community, including the instructor, can develop a shared understanding and interpretation of the artifact in order to build a unified meaning. When members fail to work toward shared meanings, collaborative learning will not occur (Stahl 2006).

2.4 Technology use in the classroom

Technology as a widely available medium is arguably most closely associated with the advent of the personal computer in the early 1980s. Technology as a classroom tool probably began early with self-paced assessments and email systems (Singara et al. 1998). As technology developed to include the investigative qualities of the internet, the concept of virtual learning media was introduced to incorporate internet resources and to introduce online courses to the curriculum (Hwang and Arbaugh 2009). Online courses, or *distance education*, refers to "a learning situation where instructors and learners are separated by distance, time, or both" (Liaw 2008, p.864). The benefits accompanying online learning included the student's ability to decide when learning will occur, fewer constraints on lecturer availability, and greater accessibility to learning materials by students (Liaw 2008).

A common theme arising from the research is the benefit of classroom-based technology use with regard to improved communication, either between students or between teachers and students. The primary, and perhaps most obvious, theme regarding the use of technology in online classrooms typically details the use of discussion boards or chat (Burgess 2009; Hwang and Arbaugh 2009; Lee 2007; Smith 2004), or the use of online tools through a networked environment (Jones 2003). Other technology tools may include email systems (Hwang and Arbaugh 2009; Singara et al. 1998) and the delivery of learning materials, in terms of virtual learning media, within a technological classroom environment (Hwang and Arbaugh 2009).

By providing a venue that enables ready access to materials and information through the internet in combination with a social/collaborative interaction within the classroom, instructors can utilize technology to inspire students to learn and increase interactivity (Burgess 2009; Ferdig and Roehler 2004). In other words, any reasonable opportunity to engage students should be pursued (Moore 2007). Common distance education tools, such as chat and discussion boards, provide such opportunities through the stimulation of student interest and motivation (Burgess 2009). Further, online learning has been shown to stimulate critical thinking in students, including aspects such as analysis, synthesis, and application of learned knowledge, an effect at least partially owing to the wide variety of texts and text forms to which students are introduced through the digital medium (Engstrom 2005; Jones 2003; Zhang and Duke 2008).

What is even more important to acknowledge is that students are often already confident in the use of some forms of technology, which may facilitate the incorporation of technology into the classroom (Elmer 2007; Kuehner 1999). Student confidence, as well as the wide variety of digital tools available to the classroom instructor, allows for the incorporation of new learning approaches (Capper 2001). Such approaches might also include acknowledging that technology will be a primary facet of the students' career and life outside of academia once their educational goals are complete (Boostrom et al. 1999; Burgess 2009; Elmer 2007). By accessing these approaches and the technology skills students already possess, teachers can engage students in the learning environment, and perhaps help them attain a greater chance at success through an increased sense of motivation (Burgess 2009; Capper 2001; Engstrom 2005; Liaw 2008).

Online learning should not be constructed as mere information-sharing in a unilateral way, whether instructor-to-student or even simply between instructor and student. Such patterns are possible, but learning becomes less than constructive. Rather, students should be provided tasks that require communal construction in which participants engage one another to develop shared meaning and knowledge construction (Dennen and Wieland 2007; Wertsch 1985). Instructors can promote this construction of knowledge by ensuring participants demonstrate they have read the entire thread of the interaction and providing assistance to help students develop the discussion by adding their own perspective (Dennen and Wieland 2007; Ferdig and Roehler 2004).

3 Methods

This qualitative research study took place in one 10-week online course and centered on analyzing classroom interactions and discussions within a university-provided online communication environment, the discussion board. The focus of this study was to examine classroom discourse in an online learning environment in order to gauge the level of student participation in classroom community knowledge construction by analyzing student-to-student and student-to-instructor exchanges. The intention was to assess the level of discussion contributions and shared meaning-making regarding the weekly discussion artifacts provided by the instructor (Dennen and Wieland 2007; Ferdig and Roehler 2004). The methodology used to analyze the discussion data was Stahl's (2006) computer supported collaborative learning (CSCL) and Dennen and Wieland's (2007) implementation of this method. Stahl (2006) was primarily concerned with developing proprietary platforms for online discussions and interactions, and therefore his work had special focus on the delivery platform for such interactions. On the other hand, Dennen and Wieland's (2007) implementation of CSCL was less concerned with the platform used within the discussion interaction than the discussions themselves. CSCL helped guide the analysis of the students' level of contribution to meaning construction in the course discussions. Specifically, this analysis was used to determine whether deeper meaning for discussion threads resulted from subsequent postings by individual students. CSCL was selected as a methodology over other possibilities in that this particular approach focuses on online learning within the group context. As Stahl (2006) tells us, "working and learning with other people mixes [our ways of learning] into yet more complex varieties" (p. 3). Group knowledge

construction can therefore "exceed what the group members could achieve as individuals" (Stahl 2006, p. 2). Hence, this implementation of CSCL provides another tool with which instructors can help shape online discussions to enhance knowledge construction by students in the classroom.

3.1 Participants and research site

This study was conducted within an online classroom at a Midwestern urban university. The researcher was an outside observer in the class and not the instructor. Further, no course instruction or curricular control was directed or guided in any way by the researcher or by this study. The students in the course were identified by the university as developmental students requiring additional reading and writing instruction to prepare them for the academic environment. The course was designated a literacy course within an online early childhood educational degree program, and therefore students were in the process of taking or had already taken other online courses. Students were not necessarily from the local community in which the university was located as the online education program in which they were enrolled catered to students nationwide.

The class, including the instructor, consisted of all women and totaled 13 in number. Six of the students in the class chose to participate in the study, and the course instructor was also a participant in the study, making seven total participants. Students were required to enroll in this course because they were identified as struggling readers and/or writers. Also, each student participant was teaching in the field in some capacity, whether in a day-care center or as a conditional K-12 instructor in a school system. Additionally, as identified by the instructor, approximately one-quarter of the students were non-U.S. nationals, which may have contributed to their identification as struggling readers/writers. The instructor did state in the final interview (Appendix A) that several of the class' students were probably ready for the English 101, the university's initial reading and writing core course. The instructor was familiar with developmental level courses, having taught several previous to this class. While the instructor had taught online courses previously as well, her experience with them was not extensive.

Only written posts from students who consented were used for this research, although the aggregate number of posts was identified for comparative analysis. All names included in this report are pseudonyms, with the instructor simply being identified as "instructor." All quotations within the data presented in this report are taken verbatim from the discussion board, and, as such, remain intact.

3.2 Data sources and collection methods

The primary data source for this study was classroom discussion threads on the course online discussion board. Seven classroom discussions were reviewed on the class' Blackboard site across the term of 10 weeks. The intention was to assess the level of discussions occurring on the site, as well as the depth of participation in the discussions in which students were engaged, measured in concepts presented and follow-on discussion threads using Stahl's (2006) CSCL methodology. These seven online discussions served as the primary data source while also informing the nature of the interviews conducted with students and the instructor at the end of the term. A post-

course interview with the instructor was also conducted in person, and was approximately 90 min in length.

3.3 Data analysis

The primary data collected for this study was taken from the course discussion board where students responded to the instructor's artifact for the week and engaged one another in discourse. Some weeks were specifically intended for independent work by the students and therefore did not have artifact-centric discussions associated with them. The artifacts provided by the instructor were typically articles that the instructor used as a discussion prompt, with the students either responding directly to the artifact or to questions students were to consider after reading the artifact. Student responses both to the artifact and to each other, including the instructor, were assessed for value to group meaning construction and classroom discussion. Sharing of personal experiences by students in their occupations and personal lives was encouraged by the instructor.

Initial data analysis consisted of establishing the total number of posts and then calculating what percentage of this number was posted by the participating students and instructor. This percentage of posts was intended to help inform the degree of participant activity within the course discussions and serve as a guide toward an understanding of the level of contribution and meaning construction within the discussion by each contributor. For those students who did not participate in the study, their contributions only appear with regard to the total number of posts, not to the level of meaning construction within the thread of the discussion.

The methodology used to analyze the discussion data was Stahl's (2006) computer supported collaborative learning (CSCL) and Dennen and Wieland's (2007) implementation of this method. Stahl (2006) describes the CSCL transaction as follows:

- Student A expresses an idea, utterance P, which is a reflection of an idea, a thought, or other cognitive concept.
- Student B interprets this utterance within the scope of her own ideas, thoughts, or conceptualizations.
- Student B responds with an idea, utterance Q.
- The interaction between P-Q is knowledge construction, and could not have occurred had Student A or Student B not been interacting.

It is this interactivity that allows deeper problem solving, robust decision making, and knowledge construction through enhanced classroom interactivity (Coole and Watts 2009; Ferdig and Roehler 2004; Johnson and Johnson 2000; Lapadat 2003).

Stahl's (2006) methodology was used as a framework to guide the analysis of the students' level of contribution to meaning construction in the course discussions. CSCL is used to "grapple with the problem of how to increase opportunities for effective collaborative working, learning, and acting through innovative uses of computer technology" (p.1). Consequently, the intent of this study was to seek improvement in instructional practice in online courses by evaluating classroom participation on the part of students and instructor for substantive interaction in order to measure the construction of meaning in class discussions. An open framework was used to identify salient data for categorization. Using this framework, topics of discussion were identified

based on the instructor-provided artifacts and followed subsequent threads by students and instructor to classify repeated concepts and evaluate the development of these concepts within the discussions. When analyzed within CSCL, contributions to the concepts guided analysis to determine the student level of contribution to the classroom discussions and whether deeper meaning for the thread was the result of postings by individual students. This analysis assessed student and instructor contributions for indexical, elliptical, or projective elements which would help identify where online conversations were falling stagnant or continuing to contribute toward deeper understandings and group meaning construction (Dennen and Wieland 2007; Stahl 2006). Individual threads and postings were examined qualitatively to examine and determine a level of group cognition and not merely numbers of postings (Dennen and Wieland 2007; Garrison and Cleveland-Innes 2005). Analysis was further corroborated with another researcher who also identified data categories and reviewed the findings in order to validate and ensure objectivity in the interpretation of the data.

One thread was analyzed in-depth for this report. This thread was chosen primarily because the contributing students were both participants in the study and as well as those who provided the majority of the posts within the discussion. Additionally, this specific thread was selected because it included a greater number of contributors, thereby providing a wider mix of perspectives and persons maintaining the discussion and participating in meaning construction.

4 Findings and discussion

The discussions in the class took the instructor-provided artifact as a prompt and allowed students to explore the ideas associated with this prompt, and thereby provided a context in which the students would create shared meaning and more deeply explore the discussion topic. The entire course anchored around the theme of aggressive behavior within classrooms and how aggression may be influenced by gender. Students were invited to explore these concepts and express personal experiences from their current teaching-related positions as well as their personal lives. Often, the artifact used to initiate conversations was an article or short story selected by the instructor. The instructor prompted students with questions to consider on the artifact provided, as well as invited them to relate the artifact to previous class readings. Postings by both students and the instructor were categorized as being indexical, elliptical, or projective contributions. Below is an example of the instructor's encouraging students to exploring the topic in more depth:

> You three are getting into a good conversation. Let me muddy the waters a bit. What is our role as educators in what we see in these children? In other words, when you intervene, do you see yourself having different conversations with boys and girls?

After acknowledging the students' efforts, the instructor prompted the students to delve more deeply into their topic and consider aspects not previously discussed while allowing students to contribute their own experiences and interpretations of the artifact. Often this was accomplished through the posing of questions that either challenge the

students' perspectives on the topic, or ask them to consider new considerations such as, "…have you ever caught yourself…?"

Evaluations of postings were qualitative. Specifically, I reviewed student and instructor postings within the thread seeking to determine if the post reflected the contributor's reading of and understanding of the previous threaded messages, or if it was simply a response to the immediately preceding message. For example, the following exchange ends with an unrelated comment that suggests the poster was not necessarily following the discussion as a whole:

> Jane: Pollack's claim of boys being seen as feminine was also evident in The Stolen Party. This happen when the young boy was frightened by the money. The magician whispered to him, "You mustn't be so unmanly, my friend." He also called him a "sissy". It bothers me that we cuddle girls when they are scared, and make fun of boys when the tables are turned. I try to treat my niece and nephew equally. It's too bad others are stuck in the "dark ages".
>
> Kendra: Hello. People judge others know or know another. So judging by the first thing they see. Do not take the time to investigate or simply see it happen the next time.
>
> Kendra: It's just like saying; Don't always judge a book by it's cover unless you have read it.
>
> Wendy: Hello. Nice posting. Like you I enjoyed reading The Stole Party, Rosaura did not let others ruin her happiness about being invited to the party. I wasnt to thrilled with the other story, it seems to be a Poor Old Me kind of story.

Each comment prior to Wendy's response was related to the topic at hand posed by Jane, that of judging others and response to roles. Yet, Wendy's response was completely unrelated to the discussion and merely a comment on the artifact story read for the week. This indicated that Wendy was not following the discussion, but rather responding to the original prompt. Additionally, throughout the analysis, I checked to see if contributors expanded upon the ideas previously presented, and whether this carried the conversation in some way to a deeper understanding of the topic artifact. What is important here is a determination as to whether the contributor has an understanding of the complete discussion, and therefore whether she is contributing to deeper knowledge construction. Again, from the above example, we see that Kendra's responses to Jane does carry forward the discussion, expanding upon how people judge others without having investigated underlying truths. Her comments assisted in the group meaning-making, and helped guide the class into a collaborative understanding of the topic being discussed. Simple responses outside of the greater context of the discussion may fulfill a requirement for taking part in course discussions, but does not help students delve into deeper meanings and a greater understanding of the topic, such as Wendy's concluding comment.

Contributions to discussions can be viewed as indexical, elliptical, or projective (Dennen and Wieland 2007; Stahl 2006). *Indexical utterances* rely on reference to context and previous contributions. *Elliptical comments* are those in which the

contribution necessarily leaves out elements previously mentioned, but those elements are understood within the discussion and inclusion would be considered redundant. *Projective comments* are those that reference future directions and expectations of the discussion, and provide a projection or direction for the discussion to move toward (Dennen and Wieland 2007; Stahl 2006). While indexical contributions may have a place within the discussion, they do not necessarily contribute to the construction of shared meaning within the conversation as they typically simply reference previous aspects without furthering the conversation. And while elliptical comments may be efficient within a conversation, they likewise do not necessarily further meaning construction. Projective comments, on the other hand, acknowledge conversational elements previously mentioned, and tend to direct the conversation in a direction for further thought, and by doing so tend to invite shared understanding and meaning making within the discussion over the artifact presented (Dennen and Wieland 2007; Stahl 2006).

4.1 Indexical contributions

Indexical responses rely on reference to context and previous contributions, but do not necessarily contribute to the construction of shared meaning. For example, the following post reflects an indexical response:

> Wendy: Nice posting. Like you, I enjoyed reading The Stole Party, Rosaura did not let others ruin her happiness about being invited to the party. I wasn't too thrilled with the other story, it seems to be a Poor Old Me kind of story.

While Wendy acknowledged a previous post, she did not develop the topic with a deeper reflection or understanding of the discussion. Her comment seemed to have the sole purpose of acknowledging the previous post and to confirm that she had read the material herself. However, she did not explore the ideas presented in the story, nor did she ask questions of others in her class that might have developed the ideas being discussed.

4.2 Elliptical contributions

Elliptical contributions are those in which the contribution necessarily leaves out elements previously mentioned and may be efficient within a conversation, but do not necessarily further meaning construction. The following exchange demonstrates an elliptical response:

> Jane (Projective): …So many people fear being the "odd man" out they would rather agree than form their own opinion. When I hear someone say that person was being aggressive, I think, "Oh they were trying to prove a point over something they felt passionate about."

> Kendra (Elliptical): Unfortunately, the harassment is quite common: hundreds of thousands of children are harassed every day. Harassment is the most common form of violence in our society. Although it will manifest itself often and the various economic and social groups, bullying is not a normal part of childhood.

Kendra's response is elliptical because in it Kendra indicated she has read Jane's posting, but Kendra did not specifically acknowledge the previous comment and her own response seemed to drift off into a different direction, stating a believed fact without relating to Jane's comments on aggression and passion.

4.3 Projective contributions

Projective contributions are those that reference future directions and expectations of the discussion, and provide a projection or direction for the discussion to move toward, and by doing so tend to invite shared understanding and meaning making within the discussion over the artifact presented. The following is a projective example:

> Jane: I wondered if Senora Ines assumed that Rosaura "knew her place," and thought she was there as an employee and not a guest.

Jane is posing a question for the group, a suggestion for further exploration of the topic artifact and not simply a comment on the artifact or what has been previously discussed. By posing a question, she is seeking to enrich the group's understanding of the reading. Each of these types of responses are reflected within the discussions of the classroom, and help us to understand how dialogue is developed within the group setting and how deeply each participant is involved in meaning-making within the class (Dennen and Wieland 2007; Stahl 2006).

4.4 Instructor contributions

Instructor responses to student posts were categorized as to whether they were redirects for further consideration and deeper meaning making or simply indexical comments. For example, this is an instructor redirect for further consideration by the student:

> I had a hard time distinguishing what you say as the connections between some of your ideas. I think they are there, but need more explanation to feel like I really am following them.

This exemplifies the instructor's attempts to draw information from the students, where she called for the student to clarify her thoughts in order to allow for a better understanding, and hence knowledge construction.

Further, I examined postings to determine if any seemed detached from the discussion entirely, and whether the instructor made effort to bring the contributor back into the conversation to ensure all students were participating in deeper meaning construction. An example of the instructor pulling the students back into the discussion is:

> Wendy: I enjoyed reading The White Circle more than Everyday Use. The White Circle was an easier read and kept me on the edge of my seat wondering what was going to happen.
>
> Instructor: You make a point that others have made, which is that reading "Everyday Use" was harder than "The White Circle." Why do you think that

is? What makes it challenging and what do we do as readers to overcome those obstacles? This is a valid and important discussion to have.

These postings exhibit the instructor's efforts to bring Wendy into a deeper level of evaluation of the stories they had read as a class through responding with thought-provoking questions. Wendy's simplistic comments did not demonstrate a deep reflection on the topics within the stories, and the instructor's reply invited Wendy to explore the stories further. Likewise, the instructor's strategies helped establish her role within the classroom, specifically that she exhibited the role of facilitator more than co-participant (Dennen and Wieland 2007).

While the instructor did not specifically indicate that meaning construction was a goal of the class, she did note that the discussions within forums in the online site were to be used by students to help develop their understanding of both the individual topics of discussion as well as develop their perceptions of teaching within classrooms. In her post-course interview, the instructor further expressed her objective that discussions were intended to help students share experiences and construct meaning. Because shared meaning requires a community of learners and participants (Barbosa et al. 2004; Coole and Watts 2009), initial analysis of the contributions established that those students who chose to participate in the study were also those most likely to contribute to classroom discussions. This might suggest that a correlation exists between classroom discussants and those who chose to participate in the study, but does not preclude that those least likely to contribute to classroom discussions did so due to their language familiarity. As mentioned earlier, some members of the class were L2 learners, although none of them decided to be participants in the study. Additionally, from the beginning of the course, the instructor informed students that participation in the forum boards during discussion weeks was not mandatory despite her initial guidelines for the discussion board (see Appendix B). The instructor made this decision after the class had begun in part to allay fears of L2 learners from having to post fragmented English responses. However, this decision probably had a major impact on the number of posts students made during the span of the course.

4.5 Sample thread

Online discussions were analyzed using CSCL. The analysis began with noting the artifact-prompt used by the instructor to initiate student reflection, and then shifted into each subsequent posting to determine the level of contribution to shared meaning construction within the class. Postings were categorized as being indexical, elliptical, or projective (Dennen and Wieland 2007; Stahl 2006). Instructor comments and responses were likewise evaluated for level of contribution, particularly as to whether her responses, too, were indexical, elliptical, or projective, and whether they attempted to draw students back into the overall conversation by redirecting student thoughts or by asking questions which would encourage students to think more deeply about the artifact topic. Despite the instructor's insistence that she was only another member of a "girlfriend" community, she consistently posed questions and encouraged students to explore new ideas and variations on the ideas they had been considering. Analysis of findings was then triangulated against the instructor's perception of learning within the classroom, accomplished through an interview with the instructor.

Table 1 is a selection from the sample thread from Week 1. Week 1 was selected as it had the most postings in the forum of any week in the class. As such, the instructor's presence was more pronounced in terms of number of posts, as were the contributions by the students in general. The artifact provided by the instructor was an initial article that explored how and why males and females display aggression. Students were then asked to reflect on this article through the following prompts:

- Do these ideas seem consistent with your own personal observations?
- Do these ideas seem too stereotypical?
- Are these ideas limited by age (meaning only people of _____ age would act the way these authors describe them).

While these posts are all prompted by the same artifact, the direction of the discussion may have changed depending on the original poster's comments. Content notes make attempts to analyze the level of group meaning making by contributors through highlighting the depth of the response. Social acknowledgments are greetings by contributors to previous posters, and as such help instill community building while also demonstrating that they have read the previous posting (Dennen and Wieland 2007). The type of posting categorizes a post as indexical, elliptical, or projective (Dennen and Wieland 2007; Stahl 2006).

The following is an excerpt from the sample thread of Week 1 that illustrates the nature of the discussion for the topic on aggression, as well as the interactions typically demonstrated by the students and the instructor throughout the class. As shown in Table 1, this is a response to a non-participant in this study and as such the initial posting is not reflected:

> Instructor (Projective): Strong response. So have you ever caught yourself reinforcing these gender roles? (I now I have).
>
> Jane (Projective): I will admit that I have been quick to snap to judgment or go on the offensive when my family is involved. I tend to be more level minded when I am the victim. I have a tendency to react first and think later when defending a

Table 1 Sample thread, week 1

Name	Content	Type
N/A	Non-participant posting.	
Instructor	Social acknowledgment. Provides questions to explore.	Projective
Jane	Adds perspective. Personal story.	Projective
Instructor	Provides questions to explore.	Projective
Jane	Adds perspective.	Projective
Kendra	Shifts focus.	Elliptical
Instructor	Acknowledgment	Indexical
Instructor	Personal story. Adds new insight.	Projective

loved one. I wouldn't call myself a bully, though sadly I have felt like an aggressor. I have also been guilty of wanting family or friends to be upset with someone because I had my feelings hurt. I guess that is the lonely teenager in me, but I think it is human nature.

Instructor (Projective): I think you are raising another important point. Does aggression=bullying? Most discussions so far sound as though aggression is considered a negative thing. Can it be positive?

Jane (Projective): I think most people view being opinionated and assertive as being aggressive. I think that more often than not the word is used out of context. So many people fear being the "odd man" out they would rather agree than form their own opinion. When I hear someone say that person was being aggressive I think, "Oh they were trying to prove a point over something they felt passionate about." If I hear someone say a person was acting aggressive I think," OK, this person got in someone's face because they didn't agree with them."

So depending on how you look at it aggression could be a positive thing. It just happens to be looked upon in a negative light.

Kendra (Elliptical): Unfortunately, the harassment is quite common: hundreds of thousands of children are harassed every day. Harassment is the most common form of violence in our society. Although it will manifest itself often and the various economic and social groups, bullying is not a normal part of childhood.

Instructor (Indexical): Interesting distinction that harassment and bullying are not the same thing. I also found the idea that harassment is a common childhood experience bullying should not be part of the common childhood experience. I can't wait to see what your peers say.

Instructor (Projective): Perhaps I can use an example with the class to steer us through paper 1. I am thinking of an incident that occurred in my home when my daughter had two friends over to play. My daughter came in upset about what one of the girls was saying about her. I told her "Ask her to stop and you just try to be a nice girl." When I read Simmons for the first time, this interaction echoed in my head. What did I really tell her about resolving conflict and handling another child's aggression? The "advice" really was not helpful to her at all, and I was immediately reinforcing the gender roles Simmons describes. I'll follow this example through in more detail as we progress through paper one so I can model the development of the paper for everyone.

The topic of bullying is the common theme throughout this discussion. The instructor, in many instances throughout the class and as exemplified in this excerpt, used questions as considerations for students to further explore the topic. Several examples are reflected above:

"So have you ever caught yourself reinforcing these gender roles?"

"Does aggression=bullying?"

"Can [aggression] be positive?"

"What did I really tell her about resolving conflict and handling another child's aggression?"

In each of these, the instructor is attempting to redirect the discussion in such a way that students will consider their ideas on aggression and extrapolate them toward developing new ideas. In some instances, the students do not necessarily pick up on the new prompt, but in others they do, such as when Jane tangentially responded to one of the instructor's questions. However, projective comments need not be questions. In Jane's posting, she makes the comments, "I have a tendency to react first and think later when defending a loved one" and "I guess that is the lonely teenager in me, but I think it is human nature." Both of these reflect thoughtful consideration of the topic, expansion of the ideas presented around aggressiveness, as she seemed to be asking her classmates whether they, too, react differently when defending loved ones, or whether human nature is to rely in some form on aggression. She continued with this same form of projective comment when she wrote, "So many people fear being the 'odd man' out they would rather agree than form their own opinion." In this case, she brought out a concept many would understand and have an opinion on, that of being the "odd man out." In this relational comment, she asked her classmates to consider this feeling of being on the outside and how this may affect aggressive behavior. Jane did not pose a direct question, but did call upon feelings of inferiority with which many of her classmates may associate.

The sample thread demonstrates that discussion contributors provided additional comments and considerations for the topic, whether this is the instructor or the students. While social acknowledgement is a device that helps convey an understanding of previous entries and also encourages community building, in the case of Week 1's posts, only two individuals used this tactic: the instructor and Wendy. In all other cases, even though posters expanded upon ideas reflected in earlier posts, none acknowledged the person by name or by indicating agreement with any one specific comment.

Students and the instructor also freely contributed personal stories to enhance or develop understanding of the topic. This was a frequent vehicle used by all contributors throughout the course. In this excerpt, two examples are shown: Jane's posting about her protectiveness when family is involved, and the instructor's posting about her daughter's upsetting conversation with her friends. By sharing personal experiences, the class members demonstrated a sense of trust in the community and a willingness to enrich collaboration, and when members work toward shared meanings within their discussions, collaborative learning occurs (de Leon et al. 2010; Stahl 2006).

All members demonstrated a sense of having read previous posts. While they may not have referred to aspects directly, the subsequent additions to the discussion helped expand the topic and incorporate personal understandings, as well as contribute to the group understanding and meaning of the initial artifact and theme, that of aggression and bullying. This is not necessarily true for all posts. In Week 5, for instance, Kendra made a statement, "It's just like saying; Don't always judge a book by it's cover unless you have read it." While the topic at hand was about judgment, the comment relied

upon an adage and thus did not necessarily reflect that the poster had purposefully read the previous discussion comments. This, however, was not the norm for the discussion postings, but rather an unusual occurrence. Overall, most postings to discussions were relational to the topic and reflected that previous aspects of the discussion were reviewed by the poster.

This sample excerpt also demonstrated the projective nature of many discussions within the class. While 73 posts were indexical throughout the course in that they indexed or referenced previous posts without necessarily expounding upon the topic, most in this excerpt were projective, or comments used to further the topic and bring a more developed meaning to the group discussion (Stahl 2006). The instructor's use of questions to prompt additional thinking on the topic by the students is a strong example of this level of discussion. Kendra's post concerning the prevalence of harassment amongst children is considered elliptical in that it does not specifically reference previous posts, but does add perspective, even though that perspective does not necessarily bring new insight to the group collaboration. The post is more akin to a fact rather than an insight or relational understanding of the topic. Other posts showed the projective nature of this excerpt in general, highlighted by the numerous expansions on the group understanding in forms of new ideas and concepts. Jane's is a good example of a projective response with regard to her conceptualization of two forms of aggression used for two end results.

Overall, the students in this class freely exchanged ideas and expounded upon each other's concepts. As a group, they began with an artifact and prompt provided by the instructor, carried the ideas to new levels, and opened up new avenues for exploration and understanding. Despite the fact that these students were all considered "developmental" learners, their discussions reflected insight and connection to personal experience, and a willingness to exchange stories and ideas in such a way that they understood the nature of connecting ideas and developing deeper meanings within a group context.

5 Conclusions and implications

Study findings demonstrate how instructors can influence student interactions within an online classroom to ensure that class discussions are effective and enhance student knowledge construction and community building, and that instructors in online courses can impact how students engage one another in classroom discourse. Discourse in this online learning environment was examined in order to gauge the level of student interaction through student-to-student and student-to-instructor exchanges in a discussion board. Through such examination, conversations were assessed for development and group collaboration, and whether participants were interpreting previous posts and expanding upon the topic of discussion, developing a deeper understanding of the topic, and engaging one another collaboratively (Coole and Watts 2009; de Leon et al. 2010; Lapadat 2003). Despite student geographic separation and therefore never being in one another's physical presence, they were able to collaborate and develop meaning around the artifact prompts the instructor assigned. While not all students participated in the study, and not all contributed to the discussions, those who did participate made efforts to engage in deeper knowledge construction as seen by their thoughtful and even personal levels of contribution as noted by their 53 projective entries, accounting for

over 10 % of all postings in the class, including those by the instructor. Students demonstrated they had read earlier posts, and their contributions were such that the topic was advanced and explored.

In context of the online classroom, students reached new understandings through collaborative discussion, an important component to learning both individually and within a community that allows students to construct knowledge within the online classroom community (Barbosa et al. 2004; Coole and Watts 2009). Dennen and Wieland (2007) have argued that successful and meaningful online discussions and interactions must have students engaged and "focused on a shared mission" (p. 295). This mission can come in many forms, and in the case of this classroom, the artifacts chosen for discussion and the subsequent dialogue between the students illustrates both social learning within the community venue as well as engagement by students willing to explore the ideas of aggression within the classroom. They all entered this class with a common goal: that of becoming certified teachers. They used this goal, this mission, to expand their own understanding within their social context.

Further implications of this study influence how to best assess online classroom discussions. Since the nature of the classroom is changing due to the increased presence of the online asynchronous offerings, particularly in that students and instructors receive limited immediate feedback during the course of a discussion, it becomes more difficult to assess whether students are actively engaged in meaning construction during discussions despite their contributions. Therefore, it becomes essential that instructors are able to assess a student's level of contribution, not only in length and frequency of posts, but also in quality as measured by a sense of contribution to deeper meaning construction (Ferdig and Roehler 2004). By allowing students to explore ideas with each other and not simply with the instructor, they are able to build upon a larger base of experience and learn of others' experiences with classroom issues. Shared personal experiences convey knowledge that all future teachers may encounter. When instructors encourage this form of sharing, and students discuss personal experiences in classroom spaces, all members of the learning community can become more aware of situations they may face in their future careers. By active engagement with one another through dialogue in a classroom space, students share a deeper level of collaborative learning where students can construct knowledge in their own way within the online asynchronous classroom, and work as a team to build and retain information (Barbosa et al. 2004; Coole and Watts 2009; Dennen and Wieland 2007).

Another study implication is that instructors can have a great impact on student involvement in the classroom, particularly through encouraging students to post and share their thoughts, as seen by the number of instructor indexical postings (49), and by prompting the students to delve more deeply into the discussion topics, as demonstrated by the number of instructor projective comments (50).

While instructors of online classrooms may not physically meet their students, they can become learning facilitators to help otherwise anonymous students engage in dialogue and grow to trust one another (Coole and Watts 2009). Instructors can, in turn, assist students in developing social and cognitive skills to aid them in learning. In this class, the instructor, despite her insistence in her post-course interview that she was only another member of a "girlfriend" community, demonstrated a knack for posing questions and encouraging students to explore new ideas and variations on the ideas they had considered as demonstrated by her 50 projective comments amounting to

nearly 10 % of all class posts. Combined with the instructor's 49 indexical posts that almost exclusively were supportive comments, she was more of a facilitator than a co-participant in the class discussions and revealed her considerations regarding the importance of identifying success of online classroom discussions by guiding and directing discussion rather than being a member of a "girlfriend" group.

The instructor was able to successfully encourage her students to explore new ideas and develop a better understanding of aggression around them and within the classroom, and did so in a way that enabled students to feel a part of the learning community, as demonstrated by their willingness to share personal experiences with individuals they had never met in person. Week 1 saw six instances alone where students were willing to share personal experiences with the class: Jane shared three, one about her family, one about a friend's son, and one about her own personal experiences as a child; Alexis shared two, the first about a school fight she had to break up and another concerning her daughter; and, Wendy shared one concerning interactions she observed between squabbling students at the school where she worked.

Additionally, as seen in this study's classroom, when instructors encourage student collaborative discussions and dialogue, instructors share power with students in the classroom and thereby promote student learning (Ferdig and Roehler 2004). Students, then, begin to master the subjects over which they take responsibility in their discussions and, in doing so, become both knowledgeable and, in some ways, experts in the topics where they are allowed to engage in experiences and personal learning (Lapadat 2003). When students were given both the opportunity to share and learn from one another, this dispersion of power roles across the class strengthens the community in which students and teacher participate (de Leon et al. 2010). This power sharing was observed in this study's classroom where 11 % of all transactions were student to student and therefore did not require the instructor's intervention. Community collaboration and knowledge construction allows students to discover new ideas and responses to situations they may not have yet experienced, and to be better prepared for their futures as classroom teachers. The CSCL methodology provided insight into classroom dialogue and assessment of student participation in classroom knowledge construction and the instructional practices of the teacher. As a methodology, CSCL greatly benefited by abilities to understand the dynamics in this classroom, both in group dynamics and in collaborative learning, and in doing so demonstrates adaptability to online classes in other settings.

5.1 Further research

Some findings of this study suggest further research should investigate certain aspects of online course operations and expectations. For example, participation in a class discussion does not necessarily equate to learning (Dennen and Wieland 2007; Ferdig and Roehler 2004). To avoid "false positives" (Dennen and Wieland 2007) in discussions in which posts do not necessarily reflect participation in developing a conversation, should discussions be run by online instructors in new ways that engage students in the conversation rather than in the activity of posting? Online discussions typically expect each student to reflect on a prompt and then respond to a set number of classmates' reflections. However, should discussions have other goals, such as driving toward deeper interactions and explorations of fewer reflections rather than more

reflections? Or, perhaps only specific students should be assigned to reflect on the prompt and then the remainder of the students should engage in these posts. By limiting the number of concurrent discussions, instructors may help students more deeply explore a concept. Another option may suggest instructors ask for shorter posts of students, but more of them. In either case, this may help create more community knowledge construction by having students examine fewer concepts but collaboratively develop meanings from them in a more extensive manner (Coole and Watts 2009).

The instructor of the course in this study did not require students to make posts once the course had begun, even though she did expect every student to participate in the discussion board at the start of the class (Appendix B). This acquiescence by the instructor was an accommodation of the L2 learners in the classroom and the anticipation of students' fears of using improper language. However, research suggests that students should be expected to participate, because collaborative construction of knowledge necessarily develops out of the community, not the individual (Barbosa et al. 2004; Coole and Watts 2009; Dennen and Wieland 2007). Further study is needed to assess whether student participation in online discussions can ensure they are meeting course learning goals.

Appendix A

Post-course instructor interview

How would you categorize yourself regarding the use of digital technologies? Inexperienced, experienced, something in between? How so?

Regarding the course [deleted], how did you like the online format? Do you feel the students learned as much in this class as they might in other typical face-to-face classes?

Regarding the course [deleted], do you think students were more motivated to participate in class discussions or less motivated than other typical face-to-face classes? Why do you think this is so?

Regarding the course [deleted], what did you think of the student-student interactions in the class? How would this compare to typical face-to-face classes?

Regarding the course [deleted], what did you think of the student-instructor interactions in the class? How would this compare to typical face-to-face classes?

If you could change something in the online format to help students learn more, what would you change?

Appendix B

Class discussion board instructions

Discussion board

There will be several points where you will be asked to participate in discussion board posts and replies to your classmates. These are less formal written assignments than

papers and are meant to represent some of our class discussions in a traditional face-to-face class. Typically the discussion board will operate as follows:

1. Students write an informal but thought provoking response to text we have read or a topic we are discussing. These can include ideas that were new to you this quarter, ideas that have clarified your understanding of something, ideas you strongly agree or disagree with, commentary about how these ideas are relevant to your daily lives, and connections you can see between multiple ideas or texts in the course overall.
2. Students will then respond to a minimum of two peers. They will read the posts and respond by building on classmates' ideas, clarifying information for classmates, expanding on the classmates' ideas, connecting with classmates' personal experiences, and questioning (respectfully and intellectually) classmates' about their ideas.
3. Students are responsible for maintaining their posts. This means that if someone comments on your posts, you are expected to acknowledge and respond to their comments. This is one of our dialogues when you will practice switching from reader to writer and back.
4. The instructor will observe the discussion board throughout the week. Usually the instructor will not comment until the end of the week in an effort to allow classroom discussion to evolve without bias or guidance from the teacher. Each individual will receive at least one response from the instructor for each discussion board assignment.

   It is the expectation that each student will treat each other and the instructor with professional respect of mutual learners. We learn not only from what we read by professional authors, but we the experiences and ideas of others. The discussion board should be a comfortable, relaxed environment where ideas can be exchanged.

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