AN EXPLORATION OF STUDENT AND TEACHER SOCIAL PRESENCE IN
ASYNCHRONOUS DISCUSSION IN AN ONLINE ADVANCED PLACEMENT
COURSE FOR RURAL HIGH SCHOOL STUDENTS

Claire de la Varre

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Approved by:

Jill V. Hamm

Jeffrey Greene

Wallace Hannum

Matthew J. Irvin

Judith Meece

ABSTRACT

CLAIRE DE LA VARRE: An Exploration of Student and Teacher Social Presence in
Asynchronous Discussion in an Online Advanced Placement Course for Rural High School
Students
(Under the direction of Jill Hamm)

This study used a social presence construct derived from the Community of Inquiry

(COI) framework, with cohesive, affective, and interactive components, to explore online

discussion in an Advanced Placement course for rural high school students. The COI is

based on the underlying theoretical framework of social constructivism, where interaction is

a key component of learning. The study focuses on the contributions of students and online

teachers to social presence in online discussion, and explores student dropout through the

lens of social presence. Teacher social presence behaviors tended to be cohesive in nature,

while students' social presence behaviors were primarily affective and interactive in nature.

The study found that compared to their peers who completed the course, many students who

dropped the course were more likely to use sarcasm, complain, or disagree with other

students. Each teacher demonstrated unique patterns of social presence behaviors. There

were also distinct patterns of student dropout characteristics associated with high social

presence and low social presence teachers.

To my daughters,

Zoë and Natalie.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure

CHAPTER 1

INTRODUCTION

Rural schools educate 30% percent of all K-12 students in the United States (National Center for Education Statistics, 2007), with the majority of these enrolled in schools of fewer than 400 students (Hobbs, 2004). In order to address challenges of declining populations and the inability to attract qualified teachers to rural areas (Barbour & Mulcahy, 2009; de la Varre, Keane, Irvin, & Hannum, 2009), rural schools increasingly turn to online distance education (ODE). ODE offers an alternative route of access to advanced courses and can help increase career aspirations and opportunities for rural students (Barbour & Mulcahy, 2009; Downs & Moller, 1999; Simonson, Schlosser & Hanson 1999; Simonson, Smaldino, Albright, & Zvacek, 2006; Singh & Dika, 2003). However, much research on ODE has reported high dropout rates and student perceptions of isolation and lack of support, in part due to the lack of visual and other non-verbal cues between student and teacher, and the often asynchronous nature of classes (Carr, 2000; de la Varre, et al., 2009; Roblyer, 2006; Simpson, 2004; Zweig, 2003, cited in Rice, 2006; Parker 1999).

Success in ODE courses depends on the student's ability for self-regulation, independent work, and use of effective time management strategies (Parker, 1999), factors that are less critical in traditional face-to-face courses where students and teachers interact continually. Rural students are used to intimate learning environments, where they often have close, long-term relationships with their teachers and typically feel a strong sense of belonging and connectedness to school and community. The adjustment to ODE for rural

students may therefore be greater than for their counterparts in urban or suburban schools and younger students may be particularly vulnerable to isolation and lack of social interaction (Hannum, Irvin, Banks, & Farmer, 2009; Hobbs, 2004). Teacher-student interaction is thought to be an important factor in student success in post-secondary ODE populations, (Hawkins, Barbour, & Graham, 2011; Tallent-Runnels, Thomas, Lan, & Cooper, 2006). Less is known about K-12 populations although supportive teacher-student interactions increase motivation and encourage progress (Hawkins, Barbour, & Graham, 2011; Nippard & Murphy, 2007)

In order to address these issues of isolation and dropout, many ODE courses include asynchronous, threaded discussion boards (DBs) where students can interact and socialize. The aims of online discussion may be multiple, including helping to foster a sense of community in the course, a place for ongoing thoughtful and self-reflective discourse among peers, and an arena for cognitive work. Online discussion in ODE is often a graded, formal course activity that involves content-based discussion where students interact and learn from each other, rather than merely a social meeting place, although some courses do also provide DBs purely for socializing (Mazzolini & Maddison, 2003).

It is important for participants in online discussion to be able to communicate with a full range of affect and emotion in order to transcend the inherent lack of visual and non-verbal cues in a text-based medium. In ODE, *social presence* is a construct concerned with the projection of the self and one's personality, and perception of the "other" in computer-mediated environments (Rourke, Anderson, Garrison, and Archer, 1999). People in online discussion forums post messages with the expectation that they have an audience; that others are "listening," i.e., watching and reading. Social presence behaviors in online discussion

therefore occur in the context of interpersonal interaction, and reflect the degree of reciprocal, mutual awareness of others, and interpersonal contact in the online environment (Aragon, 2003).

The present study is a secondary analysis of data collected from the Supporting Distance Learning in Small Rural School Districts[1] study ("Supporting Distance Learning"), conducted in two cohorts by the National Research Center for Rural Educational Support (NRCRES) between 2007 and 2009. This was a randomized, controlled design with a sample of over 700 high school students in 93 small, rural schools in 29 states across the U.S. Students were enrolled in a year-long online Advanced Placement (AP) English Literature and Composition course, in a total of 30 virtual course sections, taught by five online teachers. The intervention focused on expanding the role of the on-site facilitator, who provided students with local school-based support. While it is likely that the facilitators' behaviors and activities in the local classrooms exerted some influence on their students' attitudes to and engagement in the ODE course, facilitators did not participate in the online discussion.

The present study focuses only on social presence behaviors by students and teachers in the DBs and also examines student dropout through the lens of social presence. The findings were derived from a content analysis of transcripts of online discussion by rural high school students and their online teachers during the first month of the second cohort (2008-2009). The time period examined was chosen because the majority of students who dropped the course did so in the first four weeks. Additional data comes from post-course interviews with the online teachers. The theoretical framework guiding this study is Vygotsky's social

constructivism, which posits that learning is a social activity and student interaction is a key component of learning (Anderson, 2004; Aragon, 2003; Berge, 1996; Bibeau, 2001; Fulford & Zhang, 1993; McDonald, 2007; Moore, 1993; Richardson & Swan, 2003; Stanford-Bowers, 2008). The present study also draws on social presence research, particularly that which has utilized the Community of Inquiry (COI) framework (Garrison, Anderson, & Archer, 2001). The COI is a frequently used explanatory framework for understanding the educational experience of ODE (Akyol, 2009; Shea et al., 2010; Wise et al., 2004), and was originally conceived as "a description of the learning process in a social constructivist paradigm" (Annand, 2011). The COI offers a model for systematic empirical investigation of social presence and its relation to other learning-related elements, namely cognitive presence and teaching presence (Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, Shea, & Swan, 2008; Oztok & Brett, 2011; Rourke & Kanuka, 2009; Shea & Bidjerano, 2009).

This introductory chapter provides a rationale for exploring patterns of social presence behavior of rural students and their online teachers in an ODE course. It includes an overview of distance education, ODE in K-12 settings, ODE research, and student dropout. The chapter also introduces the theoretical framework for the study, and provides a brief summary of the study's purpose. Over the last decade, many studies have explored social presence; some have examined the relationship of social presence to student dropout, and a few have specifically looked at teacher social presence. However, almost all this research has been conducted in post-secondary populations. No study prior to this has examined student and teacher social presence, or the association of social presence with student dropout, in a rural, K-12 setting.

The Evolution of Distance Education

Distance education – access to educational opportunities for those who cannot physically attend a campus or school – has been evolving since the 19th century and has been defined as the delivery of courses that are not restricted to a same-time or same-place learning model (Moore, 1993; Simonson, et al., 2006). Beginning with mail-based correspondence courses and over time incorporating new technologies that arose, e.g., telephone, radio, TV, and video, much distance education now makes use of interactive computing technologies. Computer and Web-based technologies offer opportunities for interactivity and access to the ideas and opinions of others that were simply not possible with the older, mail-based courses or those that employed unidirectional delivery formats (Wise, Chang, Duffy, & del Valle, 2004). This has led to rapid growth in the use of distance education (Hawkins & Barbour, 2010; Setzer & Lewis, 2005; Wise et al., 2004). Although not all online learning is at a distance, and not all distance education occurs online, the associated terminology has often been used interchangeably in research literature (Rice, 2006). Online distance education (ODE) is the term used throughout this study.

ODE in K-12 Settings

ODE is widely acknowledged to have the potential to deliver a highly individualized, learner-focused educational experience that facilitates the communicative and collaborative skills needed for lifelong and independent learning (Maguire, 2005; Papastergiou, 2006; Rumble, 2001). The uptake of ODE in high schools is increasing rapidly, and the majority of states now have their own virtual schools (Barbour & Reeves 2009; Hannum & McCombs 2008; Watson & Ryan, 2007). Seventy percent of all U.S. public school districts reported students enrolled in fully-online courses in the 2007-2008 academic year: an estimated

1,030,000 students (Picciano & Seaman, 2009). The most successful online students are independent, intrinsically motivated, self-regulating learners, with effective time-management, reading, writing, and information-searching skills (Haughey & Muirhead, 1999; Land, Nwadei, Stufflebeam, & Olaka, 2003; Parker, 1999). However, ODE is not only available to the brightest and the best students; it is considered a flexible option for non-traditional students like homeschoolers, and a convenient way to deliver remedial, credit-recovery courses.

ODE is also a feasible and attractive choice for rural schools. The limited demand for advanced level courses combined with chronic problems attracting qualified teachers to rural areas mean that rural schools often cannot provide a comprehensive curriculum and may be at risk of consolidation. As a result, they increasingly turn to ODE as an alternative route of access to advanced courses and to increase career aspirations and opportunities (Barbour & Mulcahy, 2009; Downs & Moller, 1999; Simonson, et al., 1999; Simonson, et al., 2006; Singh & Dika, 2003). In 2005, the National Research Center on Rural Education Support (NRCRES) conducted the first national ODE survey to focus exclusively on rural school districts (Hannum, Farmer, Veal, Barber, & Banks, 2006). The survey found that the majority of the participating districts (85%) had used ODE before, and 69% of districts were using ODE at the time of the survey.

Students in rural schools may find that ODE is their only option for advanced courses, and enroll even though they may lack or are still learning the skills required for success (Barbour & Mulcahy, 2009; Simonson, et al., 2006). While some virtual schools use a self-paced learning model where students can enroll any time, ODE in high schools tends to be more structured, with students taking the online course in a classroom alongside their

6

peers during normal school hours. Providers of K-12 online courses therefore often utilize the *teacher-facilitator* model, assigning a local staff member as on-site facilitator or mentor to support students.

Summary of Research Comparing ODE with Face-to-Face Learning

A considerable amount of research over the past two decades has compared ODE with face-to-face learning, most frequently looking at academic achievement or student satisfaction. Generally, these comparative media studies have shown little or no difference in academic outcomes (Bernard et al., 2004; Cavanaugh et al., 2004; Hannum & McCombs, 2008; Hobbs, 2004; Russell, 1999), often concluding that most of the factors that contribute to the effectiveness of ODE are equally applicable in face-to-face settings (Zhao, Lei, Yan, Lai, & Tan, 2005). While a large body of research has shown no significant difference in learning outcomes when comparing ODE to traditional face-to-face classes, feelings of isolation (Aragon, 2003; Cereijo, Young, & Wilhelm, 2001; McInnerney & Roberts, 2004; Paloff & Pratt, 1999; Wegerif, 1998) and high attrition rates – sometimes greater than 50% (Carr, 2000; Parker 1999; Roblyer, 2006; Simpson, 2004; Zweig, 2003) – are commonly reported by online learners.

Student Dropout in ODE

A wide range of reasons for dropout in ODE is given by students and instructors (Carr, 2000) and these tend to fall under one of two explanatory beliefs: either that online students drop out of courses for the same reasons that traditional students drop out, or that online students drop out for reasons specifically relating to the online format and medium of delivery (Willging, & Johnson, 2004). Stover (2005) identified several factors that influence persistence in online courses, including academic ability, course pedagogy and curriculum,

7

financial status, and importance of GPA. If social presence influences student persistence in

a course, it may be because it facilitates a sense of connectedness and a feeling of belonging

to a group. Brown (2001) found that a number of reasons affected the sense of belonging for

an individual, e.g. the student was focused only on gaining knowledge or credits, did not

want to interact, was disengaged due to health, family, work or technology problems,

preferred face-to-face meetings, or did not give the class enough time or make it a high

priority. Dropout reasons given by adults may differ from those of high school students, who

have different goals, but due to a lack of research literature at the K-12 level (Barbour &

Reeves, 2009; DiPietro, Ferdig, Black, & Preston, 2008) and no common definition of

dropout, typical dropout rates for high school ODE courses are difficult to determine

(Roblyer, 2006).

Lack of ODE Research at the K-12 level

As a number of researchers have noted, any technology used in education should not

be implemented merely because it is available, convenient, or popular, but because it

facilitates positive outcomes (Biesenbach-Lucas, 2003; Mason, 1998; Paloff & Pratt, 2001;

Sudweeks & Simoff, 1999). However, evidence to support positive outcomes and thus the

use of specific technologies or strategies in ODE is currently minimal or lacking, particularly

in K-12 populations. ODE research has typically been conducted on samples of college

students or adult learners, and the K-12 research that does exist is rarely from a controlled or

systematic design that would allow researchers to posit causal relationships (Hannum, 2009;

Smith, Clark, & Blomeyer, 2005). Cavanaugh et al. (2004) identified only 14 empirical

research studies that looked at achievement outcomes in online learning with K-12

populations over the preceding six years. Hew, Cheung, & Ng (2008) reviewed 50 empirical

studies that looked specifically at asynchronous discussion in ODE between 1997 and 2007, but none of these was conducted on K-12 students.

As the field of ODE matures, it is vital that researchers build an empirical evidence base to inform the design and development of online courses for K-12 learners, including identifying and attending to the contextual factors that contribute to student success in ODE. This will require a shift from comparative media studies that merely confirm what has already been established by the research literature to studies that compare pedagogies, technologies, and social support strategies across online courses, and explore the environments within which these are implemented (Hannum, 2009; Lockee, Burton, & Moore, 2001). It is important to consider how ODE can make the best use of technologies that enhance interactivity, communication and collaboration (Beldarrain, 2008; Anderson, 2004), and support the different populations that use ODE (Barbour, 2007). Specifically, more examination is needed of the variables that might contribute to making the widely-used asynchronous threaded online discussion boards (DBs) an effective tool for learning, interaction, and community building. Also needed are detailed and accurate descriptions of how students behave and interact when they use DBs, and the ways in which teachers help to support and sustain these interactions. The body of research that focuses specifically on online discussion is heterogeneous, covering a variety of contexts that range from face-to-face classes that include online discussion as a component, through hybrid classes taught partly online and partly face-to-face, to classes conducted entirely online. When examining research into online discussion it is therefore important to consider the purpose of the DB, including whether participation is mandatory or optional, if posts are graded, and whether the forum is intended primarily as a social tool, for discussion of content-related topics, for

collaborative learning, or for a combination of these. (Appendices A and B detail the requirements for DB participation in this study).

In addition to the previously mentioned concerns, the adoption of computer-based technologies in education has outpaced the ability of researchers to provide empirical and theory-based support for the efficacy of such technologies (Cavanaugh, Barbour, & Clark, 2009; Cavanaugh, et al., 2004; Garrison, et al., 2001; O'Dwyer, Carey, & Kleiman, 2007; Slough & Mueller, 2006). As a result, theories applied to ODE tend to come either from classroom-based educational research, research into online media in the field of communications, or sociological literature (Hiltz, Coppola, Rotter, Turoff, & Fich, 2000). While some of this research is undoubtedly relevant to ODE settings, again, much of it studies post-secondary populations. High school students are at a different developmental stage in terms of critical thinking abilities, self-regulation, and other cognitive skills when compared to college students or adults (Barbour, 2007; Barbour & Reeves, 2009; Hudson, 2002) and so have different needs as learners. Cavanaugh et al. (2004) included a caveat: "The temptation may be to attempt to apply or adapt findings from studies of K–12 classroom learning or adult distance learning, but K–12 distance education is fundamentally unique" (p. 4).

Theoretical Overview: Social Constructivism

Changes in distance education have not been limited to those brought about by new technologies, but have paralleled the changes in pedagogy over the course of the 20th century in alignment with the shift from behaviorism to socio-cognitive perspectives in psychology (Jonassen, Davidson, Collins, Campbell, & Haag, 1995; Norton & Wiburg, 2003). In education, there has been a shift from teacher-centered, didactic models to learner-centered,

constructivist models for which knowledge is no longer considered to be something external

to the learner that is transmitted in one direction only, from teacher to student (Goertzen, &

Kristjansson, 2007; Jonassen et al., 1995; Shea, 2006; Stanford-Bowers, 2008; Vrasidas,

2000). The social-constructivist theories of Russian psychologist Lev Vygotsky have played

a large part in this shift and provide the conceptual framework for this study.

Vygotsky wrote about the mutual effects of culture and social interactions on

learning, although his work was not widely known in the West until decades after his

premature death in 1934. Vygotsky believed that social interactions shape both thought and

speech in the developing child, arguing that cognitive functions are ultimately derived from

dialogue, which first occurs between individuals and then within the self (Blunden, 1997):

"Every higher psychological function was external because it was social before it became an

internal, individual psychological function; it was formerly a social relationship between two

people" (Vygotsky, 1934/1987, v3, 144-145).

ODE courses are often designed around principles of social constructivism, in which

social activity and interaction are key components of the learning process (Anderson, 2004;

Berge, 1996; Fulford & Zhang, 1993; McDonald, 2007; Moore, 1993; Richardson & Swan,

2003; Stanford-Bowers, 2008; Tu, 2002). Particularly relevant to online arenas for

interaction and collaboration is Vygotsky's notion of the *zone of proximal development*

(ZPD): "The distance between the actual development level as determined through

independent problem solving and the level of potential development as determined through

problem solving under adult guidance or in collaboration with more capable peers"

(Vygotsky, 1978, p.86). Vygotsky (1978) posited that learning is optimized in the ZPD,

where meaning is constructed at a level slightly beyond the individual's current cognitive

ability through social interactions with more knowledgeable collaborators (Barbour & Rich, 2007; Garrison, & Arbaugh, 2007). This is known as "scaffolding," a term first introduced by Wood, Bruner, and Ross (1976). Scaffolding should include "explicit guidance, modeling, encouragement, mirroring, and feedback" (Salomon & Perkins, 1998, p.6) and, when effective, increases the ability of each participant in group discussion to function independently, ideally creating an enjoyable experience for all participants (Granott, 2006). The meaning of this metaphor is often extended to describe mutually supportive interactions among peers rather than just collaboration with a more capable partner (Granott, 2006). What is most important is a "willingness on the part of all participants to learn with and from each other" (Wells, 1999). In an online discussion forum, the group collectively becomes the ZPD for each individual participant. Students learn from each other, enabling them to practice skills and develop capabilities in a group setting with the assistance and support of others, before applying those skills independently (Borthick, Jones, & Wakai, 2003). Social presence supports these processes by facilitating discourse, helping to foster a sense of connectedness between group members, and allowing participants to feel they "know" the other members of the group (Wise et al., 2004).

Vygotsky proposed that every society has specific tools, such as pencils and paper, and symbols such as language, writing and mathematical notation, that mediate learning and also constrain and shape the patterns of interaction between learners (Barbour & Rich, 2007; Vygotsky, 1978). With the advent of the personal computer several decades ago, there has been substantial and ongoing development of computer-based tools for learning and teaching. Although Vygotsky's life and work predate personal computers and the Internet by half a century, the use of computing technology to allow learners to communicate, solve problems,

and work collaboratively is a contemporary example of the tools, e.g., computer, software, keyboard, and monitor, and the symbols, e.g., text and language, that mediate learning (Tu, 2002).

If knowledge and meaning are socially constructed, cognitive activities cannot be considered in isolation from the social and environmental contexts in which they occur (Salomon & Perkins, 1998). Vygotsky believed that the types of interaction available to the learner, and the tools and symbols that mediate those interactions, depend on both the culture and context in which those learners are embedded (Davydov & Kerr, 1995). As the culture and contexts in which ODE learners in high school are embedded are different from those in higher education settings, it can be expected that ODE in high schools may differ in some respects from ODE for post-secondary learners. Even within a single online course, students embedded in different schools experience different local environments which may influence their online experiences. In order to facilitate online interaction, as well as build connections between students situated in a variety of local settings, ODE courses often integrate online discussion into the online course. Access to DBs allows students to communicate, exchange ideas, reflect upon course content, interact with the teacher, learn collaboratively, and socialize. In the DBs, interactions are primarily text-based, and in any text-based communication medium there is an inherent lack of visual and other non-verbal cues, such as tone of voice, to help the reader understand what the "speaker" means to convey. Participants therefore learn about each other through "performance rather than appearance" (Walther, 1996):

> The information one gives about oneself is more selective, malleable, and subject to self-censorship in CMC than it is in face-to-face interaction because only verbal and linguistic cues—those that are most at our discretion and control—are our displays. (p. 20).

Vygotsky's work was concerned with face-to-face interactions and he believed that gestures, such as pointing, were an important part of these interactions: "Gestures, it has been correctly said, are writing in air, and written signs frequently are simply gestures that have been fixed" (Vygotsky, 1978, p. 107). Vygotsky felt that adults' gestures during social interactions were "an essential part of the communication and thus of guidance that adults provide" and that the child's gestures were "a crucial source of feedback for the adult" as well as contributing to the child's internalization process (McNeill, McCullough, & Tyrone, 1994). If in face-to-face interactions "gestures embody and thus display a host of assumptions about both the social and physical world" (McNeill, McCullough, & Tyrone, 1994, p. 147) then it is important to determine how such assumptions are transmitted in online interactions and how they are manifested in text. Social presence theories explore how people are able to project themselves interpersonally, and cognitively represent themselves and others intrapersonally, in analogous ways, within both face-to-face and computer-mediated settings. Learning through computer-mediated and text-based interactions is indeed possible, as much research looking at outcomes in ODE has shown. If social and academic outcomes are similar in both settings, it implies that individuals are able to derive social information from cues within the language and paralanguage used in text-based computer-mediated interactions, in ways that are similar to the information gleaned from spoken language and accompanying gestures and other non-verbal cues in direct face-to-face interactions.

Social presence cues allow individuals to move from the interpersonal to the intrapersonal in the same process that Vygotsky described, i.e., learning through social interaction which ultimately leads to the internalization of knowledge. The social

interactions that become internalized via online environments rely in part on social presence cues. Social presence research is an attempt to identify and categorize exactly what is contained in the text that allows readers to participate in what they perceive to be an interpersonal interaction – a conversation - with a real person. Social presence research attends to not only the content of the text but to paralinguistic cues that indicate the tone and emotions associated with the discussion. These include the appearance of the text and how it has been embellished for emphasis and whether emoticons, slang, and abbreviations are used to indicate sarcasm, humor, or other affective information. Paralinguistic embellishment of text is therefore an example of Vygotsky's "gestures that have been fixed" through written signs (Vygotsky, 1978, p. 107) and, as with gestures that accompany spoken language (Kendon, 2000), these paralinguistic elements allow the "speaker" to convey more than one speech act at the same time.

Purpose of the Study

Social presence is a factor that potentially supports a variety of desirable outcomes in ODE, and persistence, critical thinking, perceptions of isolation, academic achievement, and sense of community are at least partially dependent on creation and maintenance of social presence (McDonald, 2007; Marra, 2006; Perkins & Murphy, 2006; Rourke, Anderson, Garrison, Archer, 1999). Boston et al. (2009) found that some social presence indicators could predict undergraduate re-enrollment. This study utilizes the qualitative method of summative content analysis to provide an in-depth examination of the contribution of rural ODE students and their online teachers to social presence in online discussion in an AP course.

A considerable body of literature addresses social presence in online learning in higher education (Annand, 2011; Beuchot & Bullen, 2005; Gunawardena & Zittle, 1997; Hiltz, 1998; Morgan, 2010; Oren, Mioduser, & Nachmias, 2002; Shea and Bidjerano 2010), often referencing the social presence component of the Community of Inquiry (COI) framework (Rourke, Anderson, Garrison, & Archer, 2001). However, very little research has looked specifically at teacher social presence (Swan & Shih, 2005; Whiteside, 2008; Wise et al., 2004), and little is known about social presence in K-12 ODE settings. Therefore this study explores the social presence behaviors of K-12 ODE students and their teachers in online discussion, and whether social presence is associated with student dropout.

Summary of Chapter 1

This qualitative, exploratory study utilizes online discussion board data and teacher interview data collected from the second cohort (2008-2009) of the Supporting Distance Learning study. The study is theoretically grounded in social constructivism and draws from social presence research, including the COI framework and others, to examine student and teacher social presence behaviors in an AP ODE course for rural high school students. The study also explores student dropout through the lens of social presence. The findings from this study—the first analysis of student and teacher social presence in ODE in a rural K-12 setting—have relevance for curriculum designers, course developers, and teachers of ODE in K-12 settings who are concerned with a) building social presence; b) developing online interactivity; c) the role of the online teacher in moderating online discussion and fostering social presence in the group; and d) the association of social presence with student dropout.

CHAPTER 2

LITERATURE REVIEW

In ODE courses that are designed and delivered within the social constructivist paradigm, interactivity between students and their peers, and between students and their teacher, is to be desired because it is presumed to facilitate learning (Wise, et al., 2004). Consequently, opportunities for interaction such as the provision of DBs are frequently built into the curriculum. Use of DBs in ODE is often a graded, mandated activity, but DBs may also be provided as an online space for students to introduce themselves and socialize (Wise et al., 2004). Social presence, thought to facilitate and sustain discourse and support the formation of community in online groups, is a factor that has been widely studied in computer-mediated discourse, particularly in higher education. There has however been little social presence research in K-12 or rural settings, and few studies have examined the contribution of teachers to social presence in ODE (Swan & Shih, 2005; Wise et al., 2004).

This chapter contains a review of the relevant literature regarding (i) common problems in ODE, (ii) learning through interaction, (iii) social presence and its definition, (iv) social presence and sense of community, (v) characteristics of asynchronous threaded discussion, and (vi) the role of the online teacher, and then presents the research questions that guide this study.

Common Problems in ODE

The "distance" in ODE can be problematic because students who are geographically separated may feel disconnected and courses are often characterized by a lack of teacher

immediacy—the psychological closeness between teacher and student. In the traditional face-to-face classroom, teacher immediacy is conveyed through behaviors that include non-verbal signals such as smiling, eye contact, relaxed body posture, and verbal signals such as praise and the use of humor (Arbaugh, 2001; Gorham, 1988; Rourke, Anderson, Garrison, & Archer, 1999). Shea (2006) found that students perceived a "stronger sense of learning community" when exposed to teachers who displayed more immediacy behaviors. Delayed feedback and misunderstanding or frustration caused by the absence of nonverbal cues can lead to feelings of student isolation from the teacher as well as from other students in the course (Hannum & McCombs, 2008; Barbour, 2007; Carr, 2000; Roblyer, 2006; Simpson, 2004; Rovai, 2002; Tu & McIsaac, 2002). Student isolation, often attributed to a lack of personal interaction and support (Moore & Kearsley, 1996), is a significant factor in the high dropout rates commonly reported in ODE studies (Diaz, 2002; Hill & Raven, 2000; O'Brien & Renner, 2002; Picciano, 2002; Wise et al., 2004).

The most successful online students are independent, academically capable, intrinsically motivated, self-regulating learners, with effective time-management, reading, writing, and information searching skills (Barbour & Reeves, 2009; Diaz, 2002; Haughey & Muirhead, 1999; Land, Nwadei, Stufflebeam, & Olaka, 2003; Parker, 1999; Rice, 2005; Smith, Clark, & Blomeyer, 2005). In high school, however, many students are still learning such skills and even the brightest students can struggle with ODE courses. Oblender (2002) found that although many of the students in one virtual high school were bright, capable and mature, they lacked the time-management skills and self-discipline needed to succeed in online courses, and consequently dropped out. In rural schools in particular, the challenges of declining populations and the inability to attract qualified teachers to remote areas, mean

that online courses frequently offer the only access to advanced courses (Simonson, Smaldino, Albright, & Zvacek, 2006). Thus, students may have no choice other than to enroll in ODE, even though they lack the desired characteristics (Barbour & Mulcahy, 2009). Rural students are accustomed to being educated in learning environments with high levels of intimacy and teacher immediacy, and typically feel a strong sense of belonging and connectedness both to school and community (de la Varre, Keane, Irvin, & Hannum, 2009; Hedlund, 1993). Consequently, rural students may find it more of a challenge to adjust to the demands of ODE than their urban or suburban counterparts, even with appropriate academic and technological abilities (Hannum, Irvin, Banks, & Farmer, 2009). It may be particularly important for students to develop a sense of connectedness online where courses are asynchronous in nature and students are most vulnerable to perceptions of isolation (Rovai, 2002).

Creating an ODE environment which fosters social presence and the formation of community, and where students have ample opportunity to interact, should therefore be a high priority in helping students, and rural students in particular, to adjust to the challenges of this mode of education. The assumption that online learning occurs through interpersonal interaction is commonly held (Paloff and Pratt, 1999; Wise et al., 2004). In many ODE courses discussion forums offer an arena for interaction and collaboration among students, even though such interaction consists primarily of text-based and asynchronous dialogue (Ertmer & Stepich, 2004). High social presence is thought to help create an atmosphere where students will feel more comfortable interacting and asking questions, leading to greater motivation and satisfaction with the learning experience, and ultimately an environment that promotes higher levels of learning (Wise et al., 2004).

Learning through Interaction

Vygotsky (1981, p.163) stated that "all higher mental functions are internalized social relationships," reflecting his belief that knowledge originates in social interactions. A number of more recent researchers concur that in both traditional classrooms and distance education settings learning occurs through interpersonal interaction (Anderson, 2004; Garrison, & Kanuka, 2004; Hudson, 2002; Jung, Choi, Lim, & Leem, 2002; McDonald, 2007; Stacey, 2002). It is through interaction that students process their learning experiences and incorporate multiple perspectives (Jonassen, 1995; Meyer, 2003; Wise et al., 2004; Woo & Reeves, 2007). Knowledge is therefore perceived uniquely according the individual's prior experience, does not exist independently of the learner, and is influenced by community, culture, family values, race, ethnicity, gender, socioeconomic status and many other variables (Woo & Reeves, 2007; Vrasidas, 2000).

Participation in online group discussion involves an iterative combination of private reflection and shared discourse which occurs over an extended period of time compared to face-to-face discussion (Garrison & Anderson, 2003; Meyer, 2003). This allows students to assimilate information, construct knowledge individually and socially, and is thought to support the development of critical thinking skills (Garrison, Anderson, & Archer, 2001; McDonald, 2007; Stanford-Bowers, 2008; Whiteside, 2007). Garrison et al. (2001) refer to this cycle as *cognitive presence*, a process that would be familiar to Vygotsky who believed meaning was constructed in the interplay between interpsychic processes, which occur between the individual and others, and intrapsychic processes, which take place within the individual (Vygotsky, 1981, pp. 163-164).

According to Brown (2001), online community building proceeds in three stages. Firstly, the students make the acquaintance of the other online participants. Secondly, students begin to feel kinship through participation in "long, thoughtful, threaded discussion" (p. 24) on topics that all participants find important, and thirdly, a sense of camaraderie develops through online interaction sustained over time and augmented by communications outside the immediate course environment. Brown (2001) concluded that the students who described themselves as "connected" behaved in certain ways: class became a priority to which they were willing to devote time, and students were motivated to interact with their peers and did so in a respectful manner.

Brown (2001) also attends to the shifts that occur as students move from being novice online learners to "veterans." She notes that new students spend a large proportion of their time becoming familiar and comfortable with the technology and interface, understanding learner-centered methods, and becoming familiar with course structure and content. She illustrates this with a "time triangle," where the base represents the time that students take adjusting to the course, and the peak represents engagement with the class content and the construction of community. Over time the triangle becomes inverted: students who are familiar with online learning spend much more time in community-building and engaging with the course content and very little on the technology of the class (Brown, 2001).

Moore (1993) proposed that online learners interact in three dimensions: with other learners, with the instructor, and with the content of the course. Hillman, Willis, and Gunawardena (1994) added another layer of interaction, between the learner and the technological interface (Jung, Choi, Lim, & Leem, 2002). However, behavior in online discussion forums includes more than is immediately apparent in the form of captured text

21

and a lack of visible interaction is not the same as a lack of participation (Dennen, 2008; Fleming, 2008; Han, & Hill, 2006; Rourke, Anderson, Garrison & Archer, 2001; Schrire, 2006). So, a fifth dimension in which interaction occurs is vicariously, through reading and observation (Beldarrain, 2008; Sutton, 2005). Indeed, as online participants should ideally shift between private reflection and shared discourse (Garrison, Anderson, & Archer, 2001), it makes sense that students sometimes log into forums simply to read discussion posts without actively contributing.

Students who read but do not post at all, sometimes known as "lurkers" (McDonald, 2007), may not be appreciated by teachers who feel that they are benefiting from the participation of others without sharing their own knowledge or opinions (Fleming, 2008). However, there is some evidence that indicates that lurking is a strategy that ranges from "passive information gathering" (Ramirez, Walther, Burgoon, & Sunnafrank, 2002) to active learning associated with positive academic outcomes (Dennen, 2008; Fleming, 2008; Hamann, Pollock, & Wilson, 2006; Hung & Nichani, 2006; Nonnecke & Preece, 2000). Non-posting participants themselves report that they benefit from reading discussion even though they do not actively contribute (Gunawardena, Lowe, & Anderson, 1998). Lurking enables students to gather information, and form impressions of other participants, becoming familiar with the tone, content and language of a particular discussion forum before actively posting (Ramirez et al., 2002; Weinberger, 2002). Vicarious participation can thus be viewed as a form of participation on the periphery of a community of practice (Wenger, McDermott, & Snyder, 2002; Lave & Wenger, 1991). In high school populations however, where courses are time-limited and discussion participation is often mandated (as in the Supporting Distance Learning study), it is highly likely that a lack of active participation in

discussion would be penalized, although students who post to DBs are certainly expected to read the posts of other students.

Characteristics of Asynchronous Threaded Discussion

Threaded discussion is analogous, but not entirely equivalent to face-to-face discussion. A frequently-cited benefit of DBs is that those students who tend to be subdued or intimidated in a classroom environment have the opportunity to contribute equally online (Fleming, 2008; Baglione & Nastanski, 2007; Larson & Keiper, 2002; Swan & Shih, 2005). Students participating in DBs can choose which threads to read and respond to, even where participation is mandated, and latecomers to the group can catch up by reading previous or archived posts (Saka & Shiigi, 1996). In contrast, comments made during a face-to-face discussion are usually heard by everyone in the room, and latecomers miss some of the discussion. Similarly, teacher comments posted to a specific discussion forum may only be read by those accessing that particular thread whereas in a face-to-face situation teacher comments are generally intended to be heard by the whole class (Slough & Mueller, 2006). Discussion boards are designed for asynchronous participation and so naturally allow time and opportunity for students to reflect upon their own thoughts and metacognitive processes, with participants taking time to read other posts, and compose and edit their responses (Anderson, 2004; Baglione & Nastanski, 2007; Christopher, Thomas, & Tallent-Runnels, 2004; Hewitt, 2005; Jonassen et al., 1995; Larson & Keiper, 2002; McDonald, 2007; Meyer, 2003; Swan & Shih, 2005). Access to a permanent record of each post allows participants the opportunity to easily compare their own ideas with the perspectives of others (Woo & Reeves, 2007), which Palloff and Pratt (1999) describe as a "mutually empowering act" (p. 26). This exposure to varied and multiple viewpoints, where students are expected to support

their own arguments with evidence and are encouraged to question the viewpoints of both peers and the teacher is one way in which students develop the competencies they need in order to think critically and rigorously, interpret, analyze, and evaluate information (Larson & Keiper, 2002). However, simply making tools for collaboration and communication available by no means guarantees that students will use them for these purposes, and social presence *per se,* does not guarantee that students will engage in the cognitive work of learning (Garrison & Arbaugh, 2007). Formal rules for communication can be established within the course to facilitate personal interaction, for instance, stick to the topic, do not monopolize the conversation, avoid over-aggressive language, and do not type in all capitals, but these may demand new competencies and participants may take time to become comfortable with them (Baglione & Nastansi, 2007; Kerka, 1996).

Schellens & Valcke (2002) found that increased discussion led to greater levels of knowledge construction, increased social cohesion, and greater levels of student engagement and satisfaction, while Rovai (2001) stated that the sense of classroom community increased as the volume of online discussion increased. Nevertheless, students who have to contend with burgeoning amounts of information generated through multiple, simultaneous interactions with peers may have difficulty keeping track of concurrent discussions, leading to feelings of overwhelm that are detrimental to the sense of community (Fleming, 2008; Hiltz, 1998). An excess of social comments in academic, content-related forums may be perceived by students as wasting time, not getting to the point or interfering with useful learning (Rourke & Anderson, 2002; Rourke, Anderson, Garrison, & Archer, 1999). Course designers therefore often include a social arena separate from those forums used for discussion of course content to address the participants' need for social interaction without

disrupting the work environment. Some researchers suggest that the overall course design should integrate opportunities for socialization into the syllabus (Pate, Smaldino, Mayall & Luetkehans, 2009) while Beuchot and Bullen (2005) suggest that online course designers should include time before the cognitive work begins to allow participants to interact and attend to the social and emotional climate of the virtual class.

In a learning environment, having a common educational purpose and participating in shared learning activities constitutes a community of inquiry, which is one variety of a community of practice (Wenger, 1999; Whiteside, 2007). The idea of communities of practice closely echoes Vygotsky's ZPD. Learning occurs experientially and in natural settings by participation in communities of practice made up of individuals with differing levels of expertise. Learners play an increasingly central role as they increase in competence and ability and become fluent in the values and culture of that community of practice. Education thus becomes "a mutual developmental process between communities and individuals" as learners move along the continuum from novice to expert (Wenger, 1999, p. 263). However, in high school settings, and probably in many higher education settings too, the community of practice is composed of a single expert (the teacher) with the rest of the group being novices (Annand, 2011), although the novices will have varying degrees of knowledge and experience with the content of the course.

The Community of Inquiry (COI) Framework

During the 1990s, several researchers developed rubrics for sorting, categorizing and analyzing online dialogue that determined different dimensions of student learning, such as cognitive and metacognitive outcomes (Hara, Bonk, & Angeli, 1998; Henri, 1992), and learner-centered collaboration (Gunawardena, Lowe, & Anderson, 1997). Building on these

various models, Garrison, Anderson, & Archer (2000) published the Community of Inquiry

(COI) model (Figure 1), intended to provide a robust framework for textual analysis of

computer conferencing in higher education (Garrison, & Arbaugh, 2007; Swan, 2002;

Whiteside, 2007).
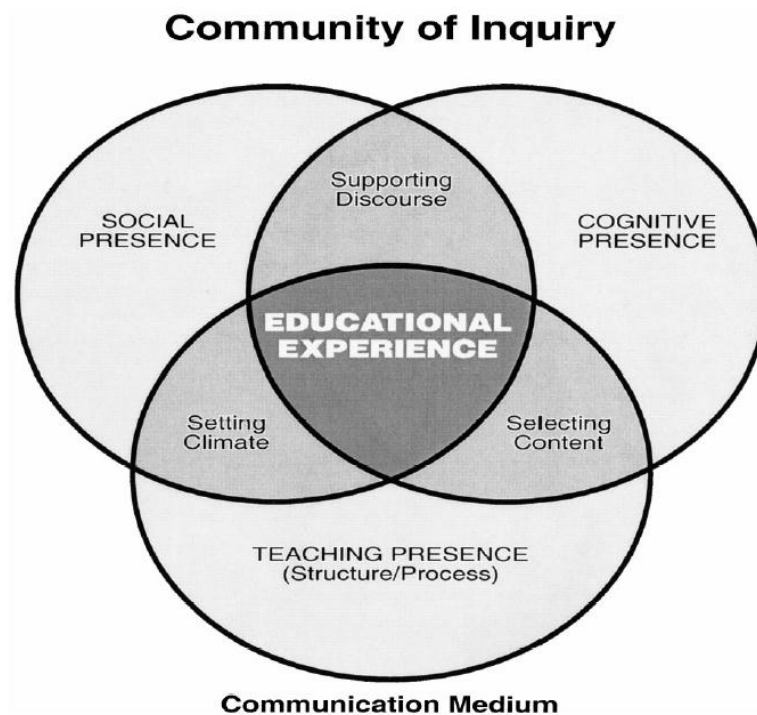
Figure 1: Community of Inquiry framework [by author permission]

The COI framework is comprised of three core elements that are believed to make up

a community of inquiry a) social presence b) cognitive presence and c) teaching presence.

Social presence is indicated by the online social interactions that contribute to emotional

expression, open communication and interactivity, and group cohesion. The *cognitive*

presence component of the COI model is defined as a "cycle of practical inquiry" through

which learners construct meaning through a process of self-reflection and shared group

discourse over a period of time. *Teaching presence* refers to course design, content

expertise, and scaffolding of learners through the "direction of cognitive and social

processes" (Anderson, Rourke, Garrison, & Archer, 2001). Learning is thought to occur as an interaction of these three elements, which are believed to contribute to the total education experience, whether in a face-to-face or online environment (Garrison, at al., 1999; Garrison, & Kanuka, 2004). Thus the COI model was intended to describe "the learning process within a social constructivist paradigm" (Annand, 2011). The structure of the COI model has been confirmed through a number of factor analyses (Garrison, & Arbaugh, 2007), and according to Google Scholar (February 23, 2012) the initial article (Garrison, et al., 2000) has been cited in over 1200 other works. Recent critiques of the COI framework suggest that social presence might occur as a result of the interaction of the cognitive and teaching presences, and also that social presence does not seem to directly affect learning (Akyol & Garrison, 2008; Annand, 2001; Wise et al., 2004).

Social Presence

The multi-faceted construct of social presence that is described in the COI framework and in other research has been evolving for more than three decades. The original definition by Short, Williams, and Christie (1976, p. 65) referenced "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships." Although this definition seems to imply that social presence is constructed by individuals as part of a reciprocal relationship, social presence theory was essentially concerned with the characteristics of the communication medium (Harms, Niederhauser, Davis, Roblyer, & Gilbert, 2006; Short, et al., 1976; Whiteside, 2007). Short et al. (1976) believed that social presence was a function of technology, and that the fewer cues available to participants in a communication medium, the less attention each individual would pay to other participants (Swan & Shih, 2005; Walther, 1996). Other researchers have disagreed: "Social presence is

27

much more complicated than previously imagined" (Tu, 2002, p. 146). Biocca, Harms, &
Burgoon (2003) defined social presence as "a sense that the mediated representation of the
other enables some level of access to the other's attentional, cognitive, or affective states" (p.
334) while Picciano's (2002) definition refers to "a student's sense of belonging in a course
or group and the ability to interact with others, although physical contact is not available" (p.
25). Harms et al. (2006) stress that social presence should be considered a property of the
individual in the process of interacting with others; participants have a greater or lesser
degree of "reciprocal awareness" and "behavioral interdependence" where what one person
says influences the next and group members learn from each other. Social presence helps to
promote trust and self-disclosure in the online environment (Gunawardena, Nolla, Wilson,
Lopez-Islas, Ramirez-Angel, & Megchun-Alpizar, 2001). A lack of trust within an online
group can lead to feelings of discomfort and may mean that members hesitate to participate
due to fear of ridicule or low expectations that participation will be beneficial (McFadzean &
McKenzie, 2001).

Social presence researchers in the 1980s and early 1990s expressed fears that
Internet-based learning was not conducive to the formation of online relationships and even
that online communication was characterized by more hostile interactions than face-to-face
communication (Oren et al., 2002; Stacey, 2002; Walther, 1996). Siegel, Dubrovsky,
Kiesler, and McGuire (1986, p. 161) believed that computer-mediated communication would
"reduce feelings of embarrassment, guilt and empathy for others; produce less social
comparison with others; as well as reduce fears of retribution or rejection." However, two
decades later, in the current era of social networking sites, widespread blogging, wikis, and
other "Web 2.0" user-centric and user-driven applications, the Internet is perceived by huge

numbers of people as a place for making social connections and sharing information, with an evident shift from tools that support individuals to tools that support interpersonal interaction (Brown, 2002; Oren et al., 2002). Despite the absence of non-verbal cues, text-based immediacy behaviors such as the use of emoticons, exaggerated punctuation and other paralinguistic cues contribute elements of both written and spoken language to online discourse and contribute to social presence (Weinberger, 2002; Wilkins, 1991). Text can convey both the meaning intended by the author, and new, additional or alternative meanings according to how that text is perceived by the reader (Tu, 2002). Therefore these immediacy indicators help individuals gauge and adjust to the social presence of other participants in the forum, thus maintaining "affective equilibrium," in much the same way as participants in face-to-face discussion (Swan & Shih, 2005). However, Swan and Shih (2005) note that not all participants in online discussion adapt to the lack of non-verbal cues by increasing their social presence behaviors; some write more formally in an effort to clarify meaning.

Online modes of communication can be highly interactive and even "hyperpersonal" (Swan, 2002; Walther, 1996). Weinberger (2002, p. 111) describes online, asynchronous discussion as "a new type of public space that enables a new type of participation." It is apparent then, that in spite of the lack of non-verbal cues in text-based, DBs, participants are able to develop meaningful online relationships, consisting of a combination of elements that Hudson (2002) refers to as "candlepower":

> …surprising intensity, personal depth, and intimacy can arise in an online forum. In essence, one is working in the dark, with attention highly focused—and people highly engaged—within a small patch of light where the narrative takes place. In asynchronous dialogue, words linger, thoughts are not interrupted… the very limitations of a purely text-based forum… far from being a drawback, turn out to be a great advantage. (p. 62).

29

Researchers have developed a variety of instruments designed to operationalize social presence, focusing on perceptions of social presence or observable behaviors such as interaction and the use of cohesive language in online environments (see Lowenthal, 2009). Although recent definitions of social presence tend towards descriptions of a concept that is socially constructed by the group (Harms et al., 2006; Lowenthal, 2009; Whiteside, 2007), each individual in the group has a part to play in fostering and maintaining social presence. Arbaugh et al. (2008) define social presence as "the ability of participants to identify with the community, communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities." In addition, Tu and McIsaac (2002) highlight the importance of individual characteristics and traits such as attitudes to technology, keyboarding skills, and reading and writing ability in contributing to social presence. Wise et al. (2004) found that other factors affect students' perceptions of social presence in an online group, including their level of trust and their purpose for taking the class and learning intentions: students who took their courses more seriously produced higher quality work. Wise et al. (2004) conclude that social presence is not a causal factor in students' learning but rather is a correlational factor: "While students recognize and respond in kind to social presence, they do not learn more, feel they learned more, or feel the experience was more useful when social presence is high (p. 267)."

Social Presence and Sense of Community

Social presence ultimately depends on interaction. People post in DBs with the expectation that others are reading their contributions and are aware of them as participants. Recent research shows that positive interpersonal interactions can lead to greater student engagement, increased satisfaction, and shared understanding, ultimately resulting in better

30

learning outcomes (Hatzipanagos, 2006; Hoskins & Van Hooff, 2005; McDonald, 2007; Saritas, 2008). Social presence describes the mutual acknowledgement of participants in online discussion and their reciprocal responses and behaviors towards each other (Rovai, 2002). Through these behaviors, participants are able to project individual personality and affect into the group setting, and thus participants mutually perceive each other as "real" people (Gunawardena & Zittle, 1997). Aragon (2003) describes social presence as "one of the most significant factors in improving instructional effectiveness and building a sense of community," while Whiteside (2007) states that the concept "motivates participants to take an active role in their own and peers' construction of knowledge."

Social presence has been found to be strongly associated with student satisfaction and persistence in online courses (Goertzen & Kristjansson, 2007; Santovec, 2004). In online, text-based environments, social presence is considered by many researchers to be a crucial component that lays the foundation for critical thinking—an outcome that can be considered a major goal of education (Garrison, & Arbaugh, 2007). It is also presumed to be a prerequisite factor for *cognitive presence*, a cycle of discussion and reflection through which students make meaning and do the cognitive work of learning (Beuchot & Bullen, 2005; Garrison, Anderson, & Archer, 2001). While social presence *per se* does not guarantee that a discussion forum will result in critical discourse, it is unlikely that such discourse will develop without it (Garrison, & Arbaugh, 2007; Rourke & Anderson, 2002).

Shih and Swan (2005) found that different perceptions of social presence depended on underlying differences in student perceptions of the nature and purpose of the online discussion. These differing perceptions influenced how students projected themselves through social presence, including their language use, tone and communication style, and

31

how they perceived the presence of other participants. Swan and Shih (2005) compared

students in an online, graduate-level course who perceived social presence to be high with

students who perceived social presence to be low. They found that the students who

perceived low social presence also had fewer social presence indicators in their messages

than the students who perceived high social presence. These students thought that social

interactions were a waste of time, did not like the online format, and found socializing

difficult or pointless. However, the Swan and Shih (2005) survey actually asked students

about perceived sense of community. A sense of community is a perception of individuals

that they belong and are connected to the group entity (McMillan & Chavis, 1986; Rovai,

2002). Rovai (2002) recognized the connection between social presence and community,

stating that "as social presence goes down, so does sense of community" but while social

presence behaviors are a prerequisite for a sense of community, social presence is not the

same as community. Therefore, when Swan and Shih (2005) found that students with low

SPD perceived low class social presence, they actually meant that those students perceived a

low sense of community or belonging. While the terms "social presence" and "sense of

community" are often used interchangeably by researchers, the concepts derive from

different literature (Wise et al., 2004). Communities can persist even though the individuals

that make up those communities change. Social presence on the other hand describes a set of

interactions between a specific set of people, and measures of social presence reflect the

extent to which participants in a group feel they know each other (Wise et al., 2004). While

several factors have been found to influence sense of community online (Aragon, 2003;

Oztok & Brett, 2011; Rovai, 2002), social presence is one of the cornerstones.

Research in corporate settings has demonstrated that community-building enhances group performance (Lave & Wenger, 1991). Fostering a climate in which people feel comfortable disclosing personal information, and thus contribute to and build social presence, increases the likelihood of a sense of community among participants (Rovai, 2002). When all participants have a collective understanding of their roles and interactions this enables a deeper understanding of the content with which the group is engaged (Lave & Wenger, 1991; Rogoff, 1994). Rovai (2002) gives a summary definition of a community, derived from several researchers, as a group of people whose characteristics include connectedness, interactivity, reciprocity, trust, and a common purpose. Indeed, without shared goals, meaningful discussion and a sense of community may not be possible (Han & Hill, 2006). Beuchot and Bullen (2005) found that DBs characterized as having more social presence showed increased interactivity among participants, and interactivity is widely acknowledged to be crucial in the formation of learning communities (Anderson, 2005; Wenger et al., 2002). Dawson (2006) found that greater levels of interaction, both with teachers and peers, increased the sense of community as well as the satisfaction that students felt in their courses.

It seems reasonable to suppose that a sense of community in online educational settings may influence outcomes (Hill, Raven, & Han, 2005). Perceptions of belonging to a community and of feeling like an "insider" have been found to increase student motivation, engagement and satisfaction (Wegerif, 1998). According to Rovai (2002), several researchers have indicated that a sense of community facilitates the transmission of information between participants in a virtual environment, as well as reinforcing commitment, cooperation and satisfaction in collaborative exercises. Cutler (1995, p.326) stated that "the more individuals

33

know about each other, the more likely they are to establish trust, seek support, and thus find satisfaction." Without these characteristics, meaningful discussion may not be possible (Han & Hill, 2006). Preece (1999) found that emotional support may be closely associated with information sharing, finding that empathy among participants in online support groups was one critical ingredient in the formation of community.

However, not all individuals in an online community have similar perceptions of connectedness or belonging (Brown, 2001). This is perhaps because both individual characteristics and group behaviors contribute to a sense of community, as do shared goals (Rovai, 2002). In a community of inquiry most students recognize that they are there not just to socialize but also to engage in academic and cognitive activities (Garrison, 2007). Shih and Swan (2005) found that different perceptions of social presence depended on underlying differences in student perceptions of the nature and purpose of the online discussion. These differing perceptions influenced how students projected themselves through aspects of social presence, including their language use, tone and communication style, and how they perceived the presence of other participants (Shih & Swan, 2005). Not all students in a course necessarily want to be sociable, and the personal goals and expectations that they bring to the course can affect perception of their teacher's social presence cues too (Wise et al., 2004). Thus, the nature of interpersonal interactions in online discussion is clearly important in determining whether students feel that they belong to the group. Brown (2001) found that a number of reasons that negatively influenced the sense of community that an individual might have felt within a course also contributed to dropout. These included a focus only on gaining knowledge or credits, lack of desire to interact with peers, problems

concerning health, family, work or technology, a preference for face-to-face learning environments, or failure to make the class a high priority.

The Role of the Online Teacher and Teacher Social Presence

While much research using the COI framework has focused on the individual types of presences there has been far less examination of how these presences support, influence, and interact with each other (Garrison, Cleveland-Innes, & Fung, 2010). Very few studies have examined how teacher social presence, which exists in the overlap between the teaching and social presences, exerts an effect on social presence. Wise et al. (2004) examined the role of teacher social presence in a higher education ODE setting, stating that "the teacher almost certainly plays a critical role in fostering … sense of community and is part of that community" (p. 249).

In courses designed on a social constructivist model, the online teacher becomes more like a facilitator of learning, the "guide on the side" rather than the "sage on the stage" (Mazzolini & Maddison, 2003, p. 237). For example, some researchers found that teachers participating in online discussion tend to contribute only 10-15% of the discussion volume compared to the bulk of the verbal interaction (up to 80%) in face-to-face settings (Jonassen et al., 1995). Mazzolini and Maddison (2003) note that in some formats teachers may be absent from discussion altogether. However, several researchers (Stacey, 2002; Anderson, et al., 2001) warn against misinterpretation of the role of the teacher in social constructivist settings. They offer a reminder that the teacher is still the expert adult whose purpose, rather than being merely a facilitator of the discussion, is to proactively support students as they engage in increasingly sophisticated forms of higher-order thinking, and to manage the direction of the discourse. As Wise et al. (2004) note, students in group discussion may just

be "reinforcing and elaborating their current misconceptions," and so online teachers need to engage in the multiple functions of modeling, monitoring and moderating online interactions; they need to be "visible" to students (Paloff & Pratt, 2001). The role of the online teacher should include the creation of a positive environment that supports learners both socially and academically, facilitating communication among all participants, responsibility for planning and implementation of the curriculum, and guiding students towards higher learning outcomes using direct instruction (Anderson et al., 2001). All of these activities fall within the element of teaching presence, in the COI framework.

Research has indicated that teaching presence is a major factor in determining student satisfaction, and perceptions of learning, and helps to promote student engagement, interaction, and sense of community (Akyol & Garrison, 2008; Anderson et al., 2001; Arbaugh, et al., 2008; Garrison et al., 2010; Kupczynski, 2010; Morgan, 2011; Shea, Li, Swan, & Pickett, 2005). Of course, none of the presences in the COI model exist in isolation (Shea & Bidjerano, 2008). Online teachers are also participants in the DBs and therefore contribute to social presence. In the COI framework, teacher social presence exists in the overlap between teaching presence and social presence, where the teacher helps to set the climate for learning (Anderson, Rourke, Garrison, & Archer, 2001).

Coppola, Hiltz, and Rotter (2004) suggest that to be effective in terms of building community and establishing trust, online teachers must establish their presence in the course immediately, by modeling "solidarity, congeniality, and affiliation," responding to posts with enthusiasm, expressing positive course expectations, and "reinforcing predictable patterns in communication and action." Discussing the connection between teacher immediacy behaviors and learning in traditional classrooms, Gorham (1988) notes that teachers can

36

"enhance their "humanness" via humor and self-disclosure (p. 52)." This comment would

seem pertinent to online teachers and also to this study, as those two items are affective

indicators of social presence within the COI framework. Wise et al. (2004) also stress the

importance of trust in students' perceptions of the social presence: students with a low level

of trust might be less aware of social cues that help to build community.

Although the effect of student-teacher interactions on learning outcomes has been

extensively documented in traditional classrooms, there is a lack of corresponding research

that examines these relationships online (Swan, 2003). Research on the influence of online

teacher behaviors has primarily focused on students' perceptions of learning, and less on

actual teacher activity. Thus, the precise nature and the optimum level of interaction between

teacher and student in the online environment are as yet unclear, as a moderator style that

stresses content, and discourages social behaviors, can be detrimental to discussion (Slough

& Mueller, 2006). Harms et al. (2006) discuss the importance of online teacher interactions

in the course, suggesting teachers should encourage collaboration between students, engage

with students (but not excessively) and provide timely feedback. Harms et al. (2006) also

include suggestions as to how online teachers can participate fully in the course, by modeling

and facilitating discourse and encouraging interaction and self-disclosure:

> Conscientiously using activities that encourage students to get to know each other
> (especially early on in the course) is important in any course—but is essential in the
> virtual school environment. Teachers can become a part of the learning community—
> sharing their personal experiences and feelings and encouraging students to do the
> same (no page number given).

Summary of Chapter Two

The purpose of this dissertation research is to examine the patterns of social presence

in online discussion in an AP ODE course for rural high school students. As outlined by the

literature review, research conducted primarily in higher education has shown that social

presence is associated with a range of positive outcomes in ODE, including increased interactivity, a greater perception of satisfaction with course and instructor, and helps foster a sense of community. However, little social presence research has been conducted in K-12 or rural settings, or has examined teacher social presence, and the optimal mode and manner of teacher behavior and interaction with students in K-12 ODE settings is unknown.

Using the research reviewed in this chapter as a basis for further exploration, this study presents findings from a qualitative content analysis of transcripts of online discussion, to examine patterns of student and teacher social presence behavior in an ODE course. The study includes additional data from year-end interviews with online teachers, and looks at student dropout through a social presence lens.

Research Questions

The aims of this study are a) to examine the patterns of social presence constructed by rural high school students and their teachers through their interactions on multiple asynchronous threaded discussion boards in an online AP English Literature and Composition course, and b) to explore associations between social presence and dropout. The research questions relating to these aims are as follows:

1. How do the patterns of social presence behaviors by students and teachers in the online discussion boards compare across sections?

2. How do the patterns of social presence behaviors of individual teachers compare?

3. To what extent and in what ways is social presence associated with student dropout?

CHAPTER 3

RESEARCH PROCEDURES AND METHODOLOGY

The present study is a secondary analysis of data collected from the Supporting Distance Learning in Small Rural School Districts study ("Supporting Distance Learning"), supported by a Research and Development Center grant (R305A04056) from the Institute of Education Sciences to the National Research Center on Rural Education Support (NRCRES). The NRCRES study was conducted in two cohorts, between 2007 and 2009. This was a randomized, controlled design with a sample of 720 U.S. high school students in 93 small, rural schools geographically distributed in 29 states. Students were enrolled in a year-long online Advanced Placement (AP) English Literature & Composition course, in a total of 30 virtual course sections, taught by five online teachers. In the second cohort, each teacher taught four virtual sections (Figure 2). The AP course was offered through *LearnNC*, a North Carolina-based course provider. Each school was required to provide a site-based facilitator, a staff member who provided students with local school-based support and was to be present when the students took the class each day. The facilitator had administrative and supervisory duties but no teaching responsibilities and, under the rules of the study, was not required to have a teaching qualification. Schools needed a minimum of four participating students to be eligible for inclusion in the study. Principals were informed that suitable students should be college-bound and the most academically-capable in the school. A pre-test modeled on an AP English examination was administered to students before they started the

online course. The results from the pre-test showed no differences in the scores or abilities of the students across groups.

The intervention focused on expanding the role of the on-site facilitator. Participating schools were randomly assigned to either the intervention or control group, with the intervention group being exposed to enhanced facilitator training. Once schools were assigned, sections of the

| Virtual Section | Each online instructor taught several sections of the course. Each section was a discrete, virtual classroom made up of either all-intervention all-control schools. |

| School 1: One facilitator, plus students | School 2: One facilitator, plus students | School 3: One facilitator, plus students | School 4: One facilitator, plus students |

DETAILED VIEW OF VIRTUAL SECTION: Comprises students from several schools (usually 2-4) in geographically-dispersed locations. Each school has a single facilitator and typically between 4 and 10 students. Each section starts with approximately 20-25 students in total and all students in the section can communicate with each other in the online space.

Figure 2: Detailed view of course organization and structure of virtual class section

online course (20-25 students each) were created to include up to four small rural schools. Each course section formed a discrete, virtual classroom. The facilitators supported the students in their online interactions with their virtual peers, their peers in the local classroom, and the online instructor. Schools within each treatment group were randomly distributed across instructors, with instructors blind to the assignment of schools. To prevent contamination, each section consisted of either all-control students or all-intervention students.

All schools adhered to an identical course timetable, although the course itself was asynchronous because schools within any given section were on different daily schedules and often in different time zones. The online teacher was required to respond to student questions or inquiries within a 24-hour period. Within each section, students were able to communicate with their online peers through participation in multiple text-based, asynchronous threaded discussion forums (DBs). Most DBs were academic in nature, relating to specific modules of study, while others were provided to enable students to introduce themselves and interact socially. Peer to peer interactions were limited to those students within the same section.

Differences between Cohorts

Cohort 1 had two online teachers and 10 course sections while cohort 2 had five online teachers and 20 course sections. Cohort 2 instructors started the year with considerably fewer students per section than in cohort 1. In cohort 1 the instructors were initially unable to meet the needs of their students in a timely fashion, due to the large class sizes. Some of the schools were affected by unforeseen problematic local factor of an environmental, administrative, or technological nature. Cohort 1 was therefore disorganized

41

for the first few weeks until a substantial percentage of students dropped the course, calendars were adjusted, and the sections became stable. This was not entirely unexpected: real-world situations are frequently messy, complex and heterogeneous (Lacey & Luff, 2001; Sandelowski, 2001). However, by cohort 2 these issues had been resolved and the course curriculum was based upon the final adjusted curriculum in cohort 1. For these reasons, the data analyzed in this study were taken solely from cohort 2.

Data Collection and Preparation

  Participant demograpics. The students in Cohort 2 consisted of 77% females and 23% males. Ethnically, the student cohort was 91% white, 2.4% Hispanic, and less than 2% each black, Asian, and American Indian. The online teachers were all white females and all had prior online teaching experience and AP experience.

  Definition of enrollment and dropout. While there is no universally agreed-upon definition of "dropout" in ODE research (Stover, 2005), for the purposes of this study all students who began the online course, i.e., posted at least one message on a DB during the first four weeks of cohort 2 (2008-2009), were included in the analysis (n=331). Students who did not post at least one message were considered to have dropped before the course began. A student was deemed to have dropped out of the course if they enrolled in and began the course, by posting at least one message on the DBs, and subsequently dropped the course. Of the 331 students that began cohort 2, a total of 121 (36.6%) students dropped out. Almost three-quarters (n=90) of these dropped the course within the first four weeks ("four-week drops"), and a further 31 students dropped sometime after the first four weeks ("later drops"). For this reason, the discussion forums from the first four weeks of the course were

the most critical to examine for indicators that participants were building social presence and community.

Description of DBs used in analysis. While collaborative exercises may have been built into the course activities later in the academic year (see Appendix A), during the first four weeks students were only required to post their individual thoughts and opinions and respond to others' posts on the DBs. The course management system (Blackboard™) automatically captured all activities by users of the system, e.g. students, online instructors, facilitators, researchers and administrative staff. Each message was automatically assigned a timestamp by Blackboard™ and was archived. The content from the DBs started during the first four weeks of the course were exported as text files for analysis. A detailed description of each DB is given in Table 1 and instructions to students regarding DB participation can be found in Appendices A and B. The social and office DBs were open throughout the whole of the course. The ice-breaker exercise and the two academic DBs associated with particular teaching modules were time-limited. However, the forums were contiguous so the students in each section essentially had a continuous, year-long discussion experience. This continuity is important in the consideration of social presence: Walther (1996) notes that when participants in DBs anticipated that they would have a longer-term relationship involving interaction over an extended period of time they were more likely to behave in a friendly manner and show curiosity about other participants. Having a discrete start and end point for each academic board ensured that the amount of content available for student reflection did not become unmanageable. Students who feel overwhelmed are less able to engage in critical analysis and construct meaning through discussion (Garrison, et al., 2000).

Table 1

Description of Discussion Boards

Forum Name and Purpose	Forum Description
Introduction to threaded discussion: structured mandatory ice-breaker activity	Students' first chance to use an ATD forum. The instructions directly encouraged interactivity: "This is your first opportunity to introduce yourself to the class and to meet virtually the other folks with whom you will be learning and agonizing. Be sure to make your original post as well as respond to some of your new classmates."
Homeroom: Social Interaction	Year-long, optional social forum where students were free to discuss any topic. Students were reminded: "This is a place for you to talk to each other outside of our scheduled class period." Only the first month of the social board will be examined.
Teacher's office: Administrative	For questions about the logistics of the course, e.g. calendars, schedules, grading, or Blackboard.
Academic Content	Two content-related forums from the first four weeks of the course are examined:
1. AP Multiple Choice Practice	Discussion about the AP multiple choice practice exam.
2. Faulkner Discussion	Discussion about William Faulkner's short story "A Rose for Emily."

Missing Data. Prior to the course teachers were not given guidelines for deleting, removing, or archiving posts from the discussion boards. This was because the focus of the original NRCRES study was on the role of the on-site facilitators, and teachers were given free rein to run the online course exactly as they would in non-research conditions. This included the occasional closing of the social boards by some teachers at times when they felt students were being distracted by them, and the removal of posts that were rude or offensive. This analysis was limited to using the data from only four of the five online teachers because

one of the facilitators associated with the fifth teacher had inadvertently deleted most of the discussion board data from the first month of the course.

Data from Year-End Teacher Interviews. Teachers were debriefed at the end of each academic year in the Supporting Distance Learning study. These interviews were concerned mainly with the behaviors of and interactions with on-site facilitators, as the facilitators were the main focus of the study. Teachers were briefly asked to comment on discussion board usage and usefulness. Any teacher comments used to corroborate or elaborate on findings in the present study came from this small subset of interview data that was relevant to online discussion.

Data Analysis. Qualitative data analysis (QDA) involves looking for patterns, positing mechanisms or processes, and looking for evidence to confirm these (Robson, 1993, p. 476). Merriam (1990, p.17) cites Patton's (1985) definition of the goals of QDA:

> …it is not attempting to predict what may happen in the future necessarily, but to understand the nature of that setting—what it means for participants to be in that setting, what their lives are like, what's going on for them, what their meanings are, what the world looks like in that particular setting.

Content analysis. The method of analysis used in this study was summative content analysis, a common qualitative and interpretive method that employs a predefined framework to code and analyze educational discourse in online DBs (Garrison, Cleveland-Innes, Koole, & Kappelman, 2006; Zhang & Wildemuth, 2009). As a methodology, content analysis involves a systematic search for patterns within textual data (Krippendorf, 2004). The method is interpretive in that the goal is to uncover and categorize patterns in the discussion (Schrire, 2006; Rourke, et al., 2001). Patton (2002) described content analysis as "any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings" (p. 453) while Hsieh and Shannon

(2005) describe qualitative content analysis as "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (p. 1278).

The process initially starts with counting manifest content, e.g., the social presence indicators in the ESP model. The analysis then proceeds to include latent meanings – those which can be inferred from the texts. As Zhang and Wildemuth (2009, p. 310) note, this method appears quantitative in the preliminary stages, although the ultimate aim is an inductive exploration of the indicator codes. The process of content analysis is systemic and reiterative, involving multiple readings of text and examination of codes, because as the coding proceeds it may bring to light patterns or enable discoveries that necessitate re-reading the text (Seidel, 1998). The underlying text and the behaviors encapsulated by the text are of primary importance; the codes themselves are heuristic pointers to the data and a way of grouping text that is similar in some way (Seidel, 1998).

Qualitative content analysis usually proceeds in eight distinct stages (Zhang & Wildemuth, 2009). These are i) preparing the data, ii) choosing a unit of analysis, iii) developing or selecting a coding scheme, iv) testing the coding scheme on a text sample, v) coding all the text to be analyzed, vi) assessing coding consistency within and across coders, vii) reporting findings, and viii) drawing conclusions. There has been much debate among researchers in the field of content analysis over the best unit of analysis. Henri (1992) favored the "thematic unit," a single thought or idea which "rests upon a logical decomposition which will make the appropriate divisions apparent" (Budd, Thorp, & Donohew, 1967), yet such categorization would depend on the subjective decisions of individual coders, leading to problems with discrimination, and resulting in the ambiguous

46

application of codes and reduced reliability (Fahy, 2001). Other researchers prefer the sentence (Corich, Kinshuk, & Jeffrey, 2007; Fahy, 2001) or the message (Rourke et al., 2000) as the logical choice of unit of analysis. Too small a unit of analysis can result in a fragmenting of the larger meaning of the conversation or discourse while too great a unit may mean missing some of the detail that a more granular approach would reveal (Garrison, et al., 2006). This echoes what Vygotsky stated: "By unit we mean a product of analysis which… retains all the basic properties of the whole and which cannot be further divided without losing them" (Vygotsky, 1962, p.4).

For this study, the unit of analysis is the message, which is easily defined and unambiguous for coders to recognize. A single message may have several purposes, e.g., serving as a greeting to the group, providing information, and disclosing the feelings of the sender. Qualitative content analysis allows the coder to assign more than one category to a text unit at the same time (Tesch, 1990). Such a message could therefore be described with multiple codes, but each code denotes only the presence of social presence indicator rather than how many times that indicator appears within a message.

The importance of counting. Qualitative data analysis software automatically counts the number of codes in any category, which can be helpful for several reasons. As Weinstein and Tamur (1978) stated: "… when one attempts to detect and describe *patterning* in a set of observations … why throw away anything helpful?" [p. 40]. Discerning these patterns by counting codes helps to avoid a major stumbling block of qualitative research— the holistic fallacy—where data that do not fit the desired pattern are disregarded or given less weight (Sandelowski, 2001). In addition, counting codes is useful for clarification of meaning: it is not always clear to the reader what is signified by the use of words that imply

47

quantity, such as "a few" or "many," "common" or "rare" (Sandelowski, 2001). Noting that there is a widespread misapprehension that qualitative researchers do not count, Sandelowski (2001) says:

> Counting is integral to the analysis process, especially to the recognition of patterns in data and deviations from those patterns… Finding that a few, some, or many participants showed a certain pattern, or that a pattern was common, thematic, or unusual in a group of participants, implies something about the frequency, typicality, or even intensity of an event. Such counting is often unconscious… yet anytime qualitative researchers take raw data and place it into categories or discern regularities in it to which they attach codes or designate as themes, they are drawing from the numbered natured of phenomena for their analysis (p. 231).

Measuring Social Presence. The raw counts of social presence codes vary with the volume of text being processed and the number of students posting in a particular course section. Therefore, the number of codes was divided by the number of messages in the discussion forum, a ratio known as *social presence density* (SPD) (Rourke, et al., 1999). While frequency can be used as evidence that a particular social presence indicator is salient, those codes that appear infrequently or not at all are also cogent to the narrative.

Social Presence Component of the COI Framework

The data in the present study were coded using a scheme derived primarily from the social presence component of the COI framework (COI-SP) (Rourke, et al., 2001). Texts can be approached or analyzed from multiple perspectives, but the use of an a priori coding scheme is an attempt to constrain a content analysis to a single perspective that can then be compared with other research that used the same scheme. This offers the advantage of being able to compare data accumulated from prior research in multiple studies (Zhang & Wildemuth, 2009).

Table 2

Description of codes in the social presence component of the COI model

Category	COI –SP Model	Description of code
Cohesive	Additional resources	Suggests resources not directly referenced in the course.
	Greetings or salutations	Communication that serves purely a social function, e.g. greetings, closures.
	Group references	Addresses the group as *we, us, our* etc.
	Social sharing	Referencing local context e.g. school, classroom, environment, community.
	Vocatives	Referring to participants by name.
Affective	Emotion	Expressions of emotion.
	Humor/sarcasm	Teasing, cajoling, irony, sarcasm.
	Paralanguage	Use of emoticons, exaggerated punctuation or embellishment of text.
	Self-disclosure	Revealing personal information about thoughts and feelings, vulnerability.
Interactive	Acknowledgement	Direct reference to others' messages.
	Compliment/agreement	Complimenting others or expressing agreement.
	Disagreement	Polite/academic disagreement, critique.
	Inquiry	Asking questions of other students or the moderator.
	Opinions or comments	Opinion or comment, not backed up by evidence.

The COI-SP (Rourke, et al., 1999) is made up of three components that collectively offer a means of describing and categorizing online interactions that contribute to the construction of social presence in group discussion (*Table 2*). The *cohesive* component consists of five codes: additional resources, greetings and salutations, group references, social sharing, and vocatives which contribute to group commitment or presence (Kucuk, 2009). The *affective* component consists of four codes: emotion, humor/sarcasm, paralanguage, and self-disclosure which can be considered as indicators of personal presence or immediacy (Kucuk, 2009). The *interactive* component consists of five codes:

acknowledgement, compliments/ agreement, disagreement, inquiry, and opinions/comments, which indicate that participants are aware of and are attending to each other and thus have interpersonal presence (Kucuk, 2009). Interactivity "is not an intrinsic trait of conference forums, and it is not a series of unrelated postings, but a collaborative effort of all the participants." (Ahern, 1994, cited in Beuchot & Bullen, 2005).

Teacher social presence. Whiteside (2007), who employed the COI-SP model in a hybrid higher education setting, discovered that it only partially explained the factors that contributed to social presence in the communities of practice she studied. She consequently modified the COI-SP with the intent to isolate the element of "teacher social presence," i.e., the part of teaching presence that comprises the teacher behaviors that have been found to contribute to social presence (Hostetter, & Busch, 2006; Swan & Shih, 2005; Whiteside, 2007). Swan and Shih (2005) noted that teacher social presence had not been researched separately from teaching presence prior to their study. They suggest that teacher social presence contributed to student perceptions of community even when engaged in activities that do not involve collaboration, as well as to perceived satisfaction with the instructor.

During the process of conceptually developing the present study, I intended to use a model similar to Whiteside's (2007) model with a separate element for teacher social presence. However, once I began the application of my extended coding scheme to the data, it became apparent that this separate element was unnecessary. While teacher social presence behaviors are a main focus in the analysis of the data in this study, content analysis software enables teacher contributions to be easily disaggregated from student contributions when separate analyses are warranted. In addition, teacher social presence is already represented in the COI framework within the overlap of social presence and teaching

50

presence. Thus for the purposes of exploring social presence in this K-12 population, the contributions of the online teacher to the DBs were coded in exactly the same manner as those of student participants. Because the COI framework has been widely cited, adopted, adapted, and tested empirically by a number of researchers since its inception, this component was considered appropriate for use in this study. However, the existing three-element social presence component of the COI framework was not completely comprehensive when applied to the Supporting Distance Learning data. In order to capture the nuances of social presence in this particular K-12 population, an expanded social presence model (the ESP model) was developed that incorporated additional codes from the Beuchot and Bullen's (2005) *interpersonality* taxonomy and from Boxer (1995). Beuchot and Bullen (2005) define interpersonality as "social or personally oriented interaction or informal communication aimed at the creation of relationships among participants," noting that it is closely related to the COI definition of social presence.

Rationale for additional social presence codes. The social presence element of the COI is intended to describe the types of online discourse that promote a supportive and positive environment in a functional community of inquiry (Shea & Bedjerano, 2010). Rourke et al. (1999) note that high scores in the social presence category of the Community of Inquiry (COI) framework suggest that the online environment is "warm and collegial" and that group participants have "a sense of affiliation with each other and a sense of solidarity with the group." While in an ideal world all online interactions in ODE would be "warm and collegial," in a strict sense of the term, social presence can refer to negative as well as positive affect (Wise et al., 2004). A limitation of the COI-SP for accurately describing social presence is therefore that the model has no codes for capturing negative behaviors. It

51

is certainly possible for a person to project themselves online as, for example, a sarcastic, antagonistic, or hostile individual. While these characteristics are unlikely to contribute to a climate that facilitates self-disclosure and a sense of community, such behaviors nevertheless convey social presence. Negative or undesirable social behaviors are worth consideration when looking at outcomes in online groups as they also affect group dynamics (Wise et al., 2004). In the COI-SP, sarcasm is part of a combined "humor/sarcasm" code, while the "disagreement" code refers to polite disagreement or critique within academic discourse, rather than more forceful argument or personal attack. In order to capture the full range of social presence behaviors, including negative behaviors, additional codes were adopted from Beuchot and Bullen's (2005) 12-category coding scheme based on *interpersonality*.

Interpersonality taxonomy. *Table 3* compares the codes from the COI-SP model with Beuchot and Bullen's (2005) interpersonality codes. Codes that are directly equivalent appear on the same row. Beuchot and Bullen (2005) code separately for negative and positive behaviors, e.g., humor and sarcasm are separate. Ask/request and inquiry are also separate; the former refers to asking a question or requesting information while the latter indicates that the participant was either asking a more complex question that would require a detailed answer, or attempting to elicit further discussion in other ways. Two codes, "chastisement" and "reserve," are not represented in the COI-SP model. *Chastisement* refers to a hostile form of disagreement, while *reserve* codes are applied to comments that deliberately attempt to end a discussion thread. In this study, the code chastisement took on a particular and slightly different meaning once the actual coding began. It appeared that while there were almost no instances of hostile disagreement in the transcripts, two of the online teachers would sometimes scold or reprimand students and thus chastisement came to mean

scolding rather than hostile disagreement.

Table 3

Comparison of COI-SP and the Interpersonality Taxonomy

Category	COI-SP	Interpersonality Taxonomy
Affective		
	Emotion	
	Humor/sarcasm	Humor and Sarcasm (2 codes)
	Paralanguage	
	Self-disclosure	Disclosure
Cohesive		
	Additional resources	Inform/Offer
	Greetings or salutations	
	Group references	
	Social sharing	
	Vocatives	
Interactive		
	Acknowledgement	Appraisal
	Compliment/agreement	Support
	Disagreement	Opposition
	Inquiry	Ask/Request and Inquiry
	Opinion or comment	Self-advocacy
		Chastisement
		Reserve

Expanding the Social Presence Model

Combining the codes from the COI-SP model with the codes from Beuchot &

Bullen's (2005) interpersonality taxonomy yields a total of 17 codes, each of which adds

something useful to the analysis of social presence beyond what is offered by either model

alone. However, a model that combines these two sets of codes still does not adequately

describe all of the interactions that occurred in the DBs in the Supporting Distance Learning

study. A small number of students interacted through conversation threads that largely

consisted of complaints. Boxer (1995) notes that complaining, defined as making negative

comments about a third party or about an external event, is actually a way of bonding: "the

underlying social strategy of much complaining behavior in the community is not negative

but positive in nature" (p219). Contrary to its appearance as a negative behavior, and far from being detrimental to social presence, "complaint sequences can often work towards establishing solidarity" (Boxer, 1995, p220). Complaint is therefore included as an additional code, within the interactive subcomponent of the expanded social presence model.

The expanded social presence (ESP) model includes a total of 18 codes. These codes, and the three sub-categories in which they reside (cohesive, affective, and interactive), can be found in detail in Appendix C. Social presence is an evolving concept that is difficult to define precisely and is a complicated concept to measure with a single instrument (Russo and Benson, 2005; Tu and McIsaac, 2002, Whiteside, 2007). The ESP model therefore builds upon the work of prior social presence researchers who have already identified codes and categories that emerged when analyzing online discussion data in educational settings, and provides an a priori framework with which to approach the analysis of transcripts. Ultimately, two codes in the interactive subcategory were not used in this analysis: there were no instances of reserve (SP17) in this cohort, and opinion/comment (SP18) was not used because the majority of messages fell into this category and the code therefore lacks discriminatory power. For this same reason, Whiteside (2007) suggested that the opinion code not be used.

Coding the Data

The data analyzed in this study include DB data from the online course and post-course interview data from the online instructors. Although the second cohort in the Support Distance Learning Study actually consisted of 20 course sections taught by five online teachers, the sections associated with the fifth teacher are not part of this analysis because she unintentionally deleted much of the discussion board content from the first month of the

course. Interview transcripts, and DB transcripts exported from Blackboard™ as text files, were imported into MAXQDA 10, a qualitative data analysis software program for the coding and analysis of textual data. The process of coding and categorizing helps to reorganize and thus reduce the complexity of large amounts of textual data (Seidel, 1998). Because it is concerned with the analysis of online conversation, qualitative content analysis draws from content- and discourse-analysis literature (Hara, et al., 1998). The goals of content analysis of transcripts are both to describe the insights that a casual reader would receive from perusing the online discussion forums, and to bring to light further information that is not apparent from merely reading through the data (Anderson, et al., 2001). Data from DBs are readily available to researchers as a resource for analysis because online discussion is automatically captured and archived by the course management system that delivers the course.

Inter-coder reliability. Inter-coder reliability is "the extent to which different coders, each coding the same content, come to the same coding decisions." (Rourke, et al., 2001). In a literature review looking at reporting of inter-coder reliability in content analysis research, Lombard, Snyder-Duch,, and Bracken (2005) found that only 69% of published studies reported any reliability data, and those that did were often ambiguous or "represented inappropriate decisions by researchers." In order to trust any analyses based on measures it is vital to be able to trust the measures themselves (Riffe, Lacy, & Fico, 2005), and as Neuendorf (2002) observes, "without the establishment of reliability, content analysis measures are useless" (p. 141). It is therefore important to establish inter-coder reliability, to ensure that a coder is not applying codes in some idiosyncratic or non-systematic manner. Researchers should report both simple agreement (which does not take into account the effect

of chance) and reliability adjusted for chance, using an appropriate formula (Riffe et al., 2005). Reliability is easier to achieve when codes are manifest (observable in the text) making them easier for coders to recognize, rather than latent, which involves some subjective cognitive decisions on the part of the coder. In the ESP model, cohesive codes are manifest, and most of the interactive codes are manifest, although the complaint/whining and chastisement codes are perhaps more open to subjectivity. The affective codes, except for paralanguage, are latent and thus the determination of emotion, humor/irony, sarcasm, and self-disclosure is more subjective than for other codes. Self-disclosure reveals something about the self, usually the participant's thoughts or feelings, and often expresses vulnerability. So "I struggled with the exam" would be categorized as self-disclosure whereas "the exam was hard" is considered an opinion.

Coder training. For this study there were two rounds of coder training. The first round, using about 100 messages (practice data not included in the final analysis), was designed to identify potential problems in applying codes correctly or differences in opinion as to what the codes meant. The two coders in the practice round were both researchers on the study and therefore familiar with at least some of the discussion board content. First the coders became familiar with the various categories and codes in the ESP model, then read over the test transcripts, and finally proceeded to code the training transcripts. During coding, both coders referred to the description accompanying each code as necessary, for examples of the instances in which each code was to be applied. Each message was also tagged with administrative codes e.g., name of forum, author ID, and section ID. The first coder applied a total of 136 codes and the second coder applied 149 codes. Reliability coefficients (Scott's Pi, Cohen's Kappa, and Krippendorf's Alpha) were obtained for each

code in the model using online reliability calculation software ReCal2 (Reliability Calculator for 2 coders, http://dfreelon.org/utils/recalfront/recal2/). Although these chance-corrected reliability measures are considered to be conservative, an acceptable level of inter-coder reliability for content analysis is 0.7 or above (Lombard, et al., 2005; Rourke, et al., 1999). In this training round, three codes (social sharing, self-disclosure, and acknowledgement) had coefficients slightly lower than 0.7. Figures 3 and 4 show an example of a coding disagreement where one coder had applied a "social sharing" code to a message and the other coder had not.
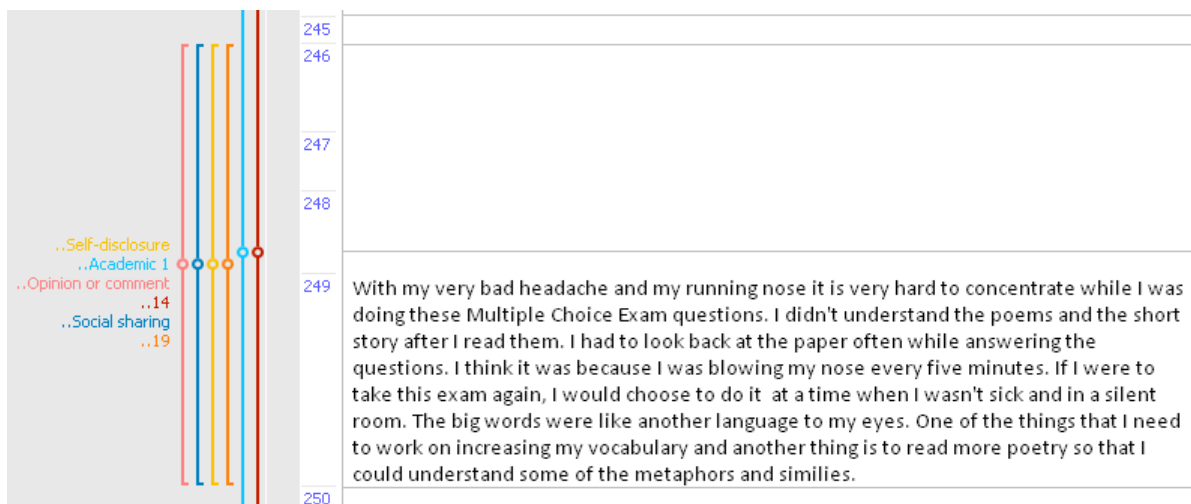
Figure 3: Message coded by first coder

Six codes, applied by the first coder, are visible in the message shown in Figure 3. Three of these codes are administrative codes, which help to organize the data and are not related to content (student ID, section, and discussion forum). The message itself is coded with three social presence codes: self-disclosure, opinion/comment[2], and social sharing.

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[2] Note that although coders applied the code opinion/comment to the transcripts, but as almost every message was either an opinion or comment this code is not useful and is consequently not used in any analyses. Whiteside (2007) had added this code to her model, but later recommended that future researchers not use it, for this same reason.

There are three codes, applied by the second coder, visible in the message shown in Figure 4. The code on the right is an administrative code to indicate student ID (the second coder did not code section and forum). The message itself is coded with two social presence codes: self-disclosure, and opinion/ comment. Comparing the two messages, it can be seen that the first coder included an additional code, for social sharing. Following coder training, the coders discussed differences in the application of these three codes. Both coders agreed that the message could indeed be coded as social sharing because of the phrase ("in a silent room") which implied that the room was not silent during the exam, and so the message did impart something about the local environment in an indirect way. Similar discussions took place around the other two codes with lower reliability, the outcome being that use of these codes was clarified before coder 1 ("main coder") commenced coding the data for the study.
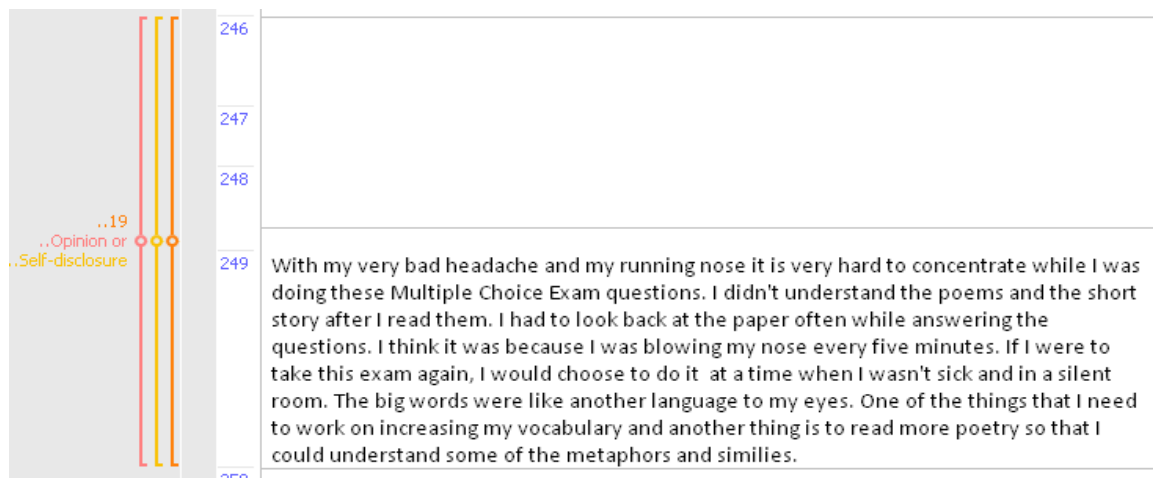
Figure 4: Message coded by second coder

Calculation of inter-coder reliability. As there was to be only one coder for the study data, it was important to determine the extent to which another coder would make the same coding decisions. Even when a sample had been coded consistently and reliably it is not appropriate to assume that this applies to the entire body of the text. Coders become tired and make mistakes and their understanding of the definitions of categories and the coding

58

rules may evolve over time (Zhang & Wildemuth, 2009; Miles & Huberman, 1994). The second round, using the actual data, was therefore intended to formally calculate reliability by coding 300 messages. Because of the large volume of text to be coded, this was approximately 5% of the data. The second coder in this round had not previously worked on the research study and was therefore unfamiliar with the content of the DBs and the coding scheme at the commencement of the training. With an a priori framework, coders should not need in-depth knowledge of the study to perform their task—any appropriately trained person should be able to apply the codes consistently using the instructions for coding as their guide (Krippendorff, 2004, p. 131). However, for the examination and analysis of the data, an in-depth familiarity gained through immersion in the data is essential (Lacey & Luff, 2001).

Inter-coder reliability was calculated for each code, using ReCal2, and is shown in Table 4. Where the inter-coder reliability is recorded as "undefined" in the table, this is because there were no instances of those particular social presence indicators in the coded messages, so both coders agreed 100% and the cells contained zeroes. While for most codes the inter-coder reliability coefficients were very good, for emotion (SP6) and humor/irony (SP7) the coefficients were lower than acceptable for content analysis (0.39 and 0.50, respectively) although the humor irony code could be considered borderline (Beuchot & Bullen, 2005). This underscores the previous assertion that determination of latent variables such as emotion and humor is not straightforward and is often subjective. Even though emotion and humor/irony coefficients were lower than acceptable in the formal round of coding, in the initial coding training with the two coders who were both researchers on the project these codes had similar coefficients, above 0.7.

Table 4

Inter-Coder Reliability

Social Presence (SP) Code	Percent Agreement	Scott's Pi	Cohen's Kappa	Krippendorff's Alpha
Reference to resources (SP1)	96.9	0.81	0.81	0.81
Greetings/social niceties (SP2)	97.9	0.91	0.91	0.91
Group references (SP3)	96.9	0.83	0.83	0.83
Social sharing (SP4)	96.5	0.84	0.84	0.85
Vocatives (SP5)	98.6	0.95	0.95	0.95
Emotion (SP6)	83.3	0.39	0.39	0.39
Humor/irony (SP7)	93.4	0.50	0.50	0.50
Sarcasm (SP8)	100.0	undefined	Undefined	undefined
Paralanguage (SP9)	97.2	0.94	0.94	0.94
Self-disclosure (SP10)	91.0	0.82	0.82	0.82
Acknowledgement (SP11)	92.4	0.84	0.84	0.84
Ask/request/inquiry (SP12)	97.9	0.93	0.93	0.93
Chastisement (SP13)	99.3	0.87	0.87	0.87
Complaint (SP14)	100.0	undefined	Undefined	undefined
Compliment/agreement (SP15)	95.1	0.88	0.88	0.88
Disagreement/critique (SP16)	99.7	0.80	0.80	0.80

Coding is a subjective act. When using an a priori coding scheme the purpose of determining inter-coder reliability is to ensure that different coders apply codes in the same way, or that one particular coder is not applying codes in an idiosyncratic manner. The coding process occurred over a period of four months, and because the data analyzed came from a single coder, it was therefore important to determine that stability over time was acceptable in the study (Weber, 1990).

Table 5

Coder Stability across Two Time Points

SP Code	Percent Agreement	Scott's Pi	Cohen's Kappa	Krippendorff's Alpha
Reference to resources (SP1)	95%	0.827	0.827	0.828
Greetings/social niceties (SP2)	95%	0.875	0.875	0.875
Group references (SP3)	97%	0.879	0.879	0.88
Social sharing (SP4)	100%	1	1	1
Vocatives (SP5)	98%	0.935	0.935	0.935
Emotion (SP6)	99%	0.795	0.795	0.796
Humor/irony (SP7)	99%	0.904	0.904	0.904
Sarcasm (SP8)	100%	undefined	Undefined	undefined
Paralanguage (SP9)	95%	0.893	0.893	0.894
Self-disclosure (SP10)	90%	0.774	0.774	0.775
Acknowledgement (SP11)	91%	0.82	0.82	0.821
Ask/request/inquiry (SP12)	97%	0.891	0.891	0.892
Chastisement (SP13)	100%	1	1	1
Complaint (SP14)	100%	undefined	Undefined	undefined
Compliment/agreement (SP15)	98%	0.926	0.926	0.926
Disagreement (SP16)	100%	undefined	Undefined	undefined

Table 5 shows the reliability coefficients for the main coder across two time points, three months apart. Inter-coder reliability was calculated for each code, using ReCal2, and is shown in Table 4. All coefficients were acceptable, with emotion and self-disclosure having the lowest coefficients (0.79 and 0.77, respectively). Where the inter-coder reliability is recorded as "undefined" in the table, this is because there were no instances of those particular social presence indicators in the coded messages, so both coders agreed 100% and the cells contained zeroes. Having used codes to identify social presence behaviors, the next task was then to re-examine the text within the categories in order to create the narrative (Lacey & Luff, 2001). As several researchers caution, the analysis of transcripts from text-

based discussion forums gives us access only to those interactions that were manifest because they were captured in print (Garrison, et al., 2001; Schrire, 2006). Social presence coding is therefore better at explaining "what" is going on rather than "why" although the "why" can be further explored by delving back into the data underlying the codes and categories (Whiteside, 2007).

Relevance of the Study

This study has relevance for curriculum designers, online course developers, and teachers of K-12 ODE courses interested in fostering social presence, interaction, and community. It lays the groundwork for further exploration of social presence behaviors in online students and teachers and how these help set the learning climate and create community. Several researchers have identified several strategies for teachers to successfully develop and maintain social presence in postsecondary learning communities (Aragon, 2003; Mazzolini & Maddison, 2007; Wise, 2004). Such strategies may also be relevant to learners in K-12 settings. However, it is important to first explore what social presence looks like in this population, including to what extent teachers in this K-12 ODE setting used similar strategies or provided additional ones.

CHAPTER 4

RESULTS

This analysis explores social presence in online discussion during the first four weeks of a year-long online AP English literature and composition course delivered to rural high school students. The cohort (2008-2009) consisted of 331 students distributed across 16 virtual course sections. Four online teachers each taught four course sections: Teacher One taught sections 1-4, Teacher Two taught sections 5-8, Teacher Three taught sections 9-12, and Teacher Four taught sections 13-16. While the study designed initially allocated approximately equal numbers of students to each section and each teacher, in practice, a number of individual students and some entire schools dropped out of the sections before the course began. Therefore, the number of students in each section at the beginning of the course ranged from 11 to 25, with Teacher Four having slightly more students per section than the other teachers.

For the majority of the rural students in the Supporting Distance Learning study, this was their first online course. The geographic separation of students over 29 states, including Alaska, provided the potential to learn about local and cultural differences, and to broaden horizons. Students quickly began discussing personal tastes in music, books, and food, politics, religion, family, school, current jobs, aspirations for college and careers, travel, and sports. They also compared notes on life in rural America, including topics such as weather, farming, extracurricular activities, animals, and transportation. These conversations occurred in the social and ice-breaker boards, and to a lesser extent in the academic boards. Messages

in the office boards were typically limited to asking questions of the teacher and responses to those questions that indicated how to resolve the problem or issue.

The small rural schools that made up each section were often in different time zones. As the course was asynchronous, students tended to "chat" on the DBs mainly with those who were online at the same time. This meant that students were often speaking online to their peers who were located in the same school and therefore in the same physical space. One teacher temporarily closed the social DB in one of her sections because this type of "silent" chat going on during class period within a group of peers in the same local school was distracting students from their coursework. Students would also converse regularly with students in other schools in the same time zone who were online during the same class period or had recently posted messages. There was less discussion where students would respond to messages posted hours or days previously, although this did happen to some extent.

Measuring Social Presence

Social presence is a construct concerned with the projection of the self, and perception of the "other" in computer-mediated environments. In the present study, social presence was determined by using an a priori coding scheme (the Expanded Social Presence (ESP) model) derived primarily from the social presence component of the COI model (Garrison, et al. 1999), with additional codes from the interpersonality taxonomy proposed by Beuchot and Bullen (2005). The social presence codes in the ESP model were applied to online text-based interactions in order to look at the multiple social functions of the language used by discussion participants. The unit of analysis for this study was the message, defined as a single post by an individual. A message could be of variable length, and ranged from one or two words, to multiple paragraphs. In all, 5,744 messages were coded. The social

presence codes from the ESP model were applied to these messages a total of 11,558 times. Each code was applied no more than once to any message, thereby coding for the presence of the indicator rather than the total number of times the social presence behavior occurred in that message. Because the raw number of messages or codes in a section is an artifact of the number of students in that section and the volume of text, as a measure of social presence it is more useful to graph the *social presence density* (SPD) ratio (Rourke, et al., 1999), calculated by dividing the number of codes by the unit of measurement (i.e. the message). An overall section SPD of 2.3 would mean that each message posted in that section contained instances of on average 2.3 distinct social presence behaviors.

First Research Question

How do the patterns of social presence behaviors by students and teachers in the online discussion boards compare across sections? The findings relating to the first research question provide a broad picture of the social presence behaviors of students and teachers on the online DBs. This includes the number of messages posted, the distribution of social presence codes, and the percentage of students who engaged in the social presence behaviors. The findings continue with an in-depth examination of SPD for each of the 16 social presence codes, with each social presence behavior being illustrated with quotations taken from the discussion board transcripts.

Figure 5 compares the numbers of student and teacher messages posted. The mean number of messages per student in each section ranged from a low of 3.8 messages per student (section 8) to a high of 43.5 messages per student (section 10). The number of messages posted by individual students ranged from a low of 1, to a high of 218, although two-thirds of students (67%) posted fewer than 25 messages each. Teacher contributions to

the discussion boards varied, ranging from a low of one message per 93 student messages (section 15) to a high of one message per six student messages (section 8).
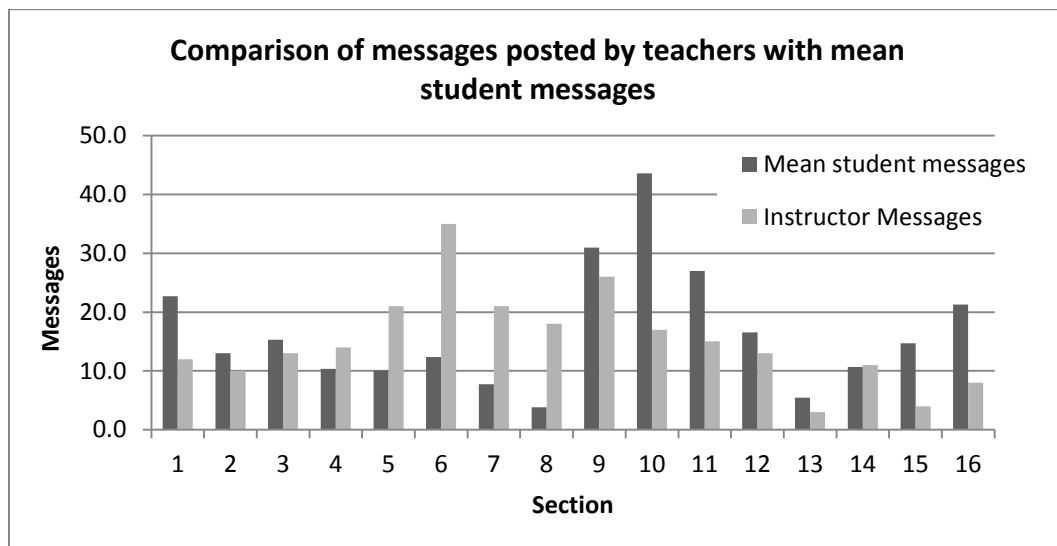

Comparison of messages posted by teachers with mean student messages

Figure 5: Comparison of messages posted by teachers with mean student messages

Teacher One averaged 12 messages per section. Teacher Two posted the most messages overall of all the teachers, with an average of 24 messages per section, and was most active in section 6, posting 35 messages. Teacher Three posted an average of 18 messages per section. Teacher Four posted the least of all the teachers, with an average of just 6.5 messages per section, although this statistic may be artificially low as she inadvertently deleted the first month's posts in the section 13 office DB.

Figure 6 compares SPD in each section for students and teachers. Teachers One and Two had a higher SPD than their students' in all their sections, and generally had a higher SPD than Teachers Three and Four. Student SPD ranged from 1.15 to 2.71 while teacher SPD ranged from 1.08 to 3.0.
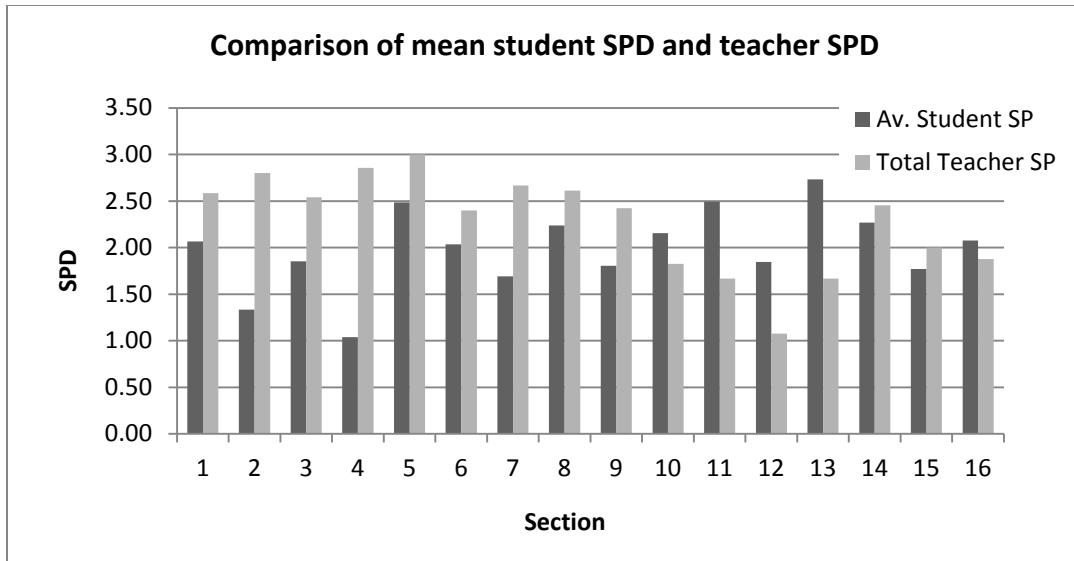
Figure 6: Comparison of mean student SPD and teacher SPD

Table 6

Number of times social presence codes were applied

Social Presence (SP) Code	Subcategory	In Number of Messages
Self-disclosure (SP10)	Affective	2401
Acknowledgement (SP11)	Interactive	1884
Paralanguage (SP9)	Affective	1468
Compliment/agreement (SP15)	Interactive	1194
Ask/request/inquiry (SP12)	Interactive	874
Emotion (SP6)	Affective	755
Vocatives (SP5)	Cohesive	741
Social sharing (SP4)	Cohesive	707
Greetings/social niceties (SP2)	Cohesive	427
Group references (SP3)	Cohesive	401
Humor/irony (SP7)	Affective	362
Reference to resources (SP1)	Cohesive	210
Disagreement/critique (SP16)	Interactive	84
Chastisement (SP13)	Interactive	24
Complaint (SP14)	Interactive	14
Sarcasm (SP8)	Affective	12

Table 6 gives the overall distribution of the social presence codes for all participants in the discussion. *Self-disclosure*—expressing vulnerability or revealing personal thoughts, feelings, or behaviors—was the most frequently applied code, occurring in 2,401 messages, while *sarcasm* was the least-represented social presence behavior, occurring in only 12 messages. Other frequently applied codes were *acknowledgement* (directly referencing another's post), *paralanguage* (embellishment of text or non-standard use of language), and *compliment/agreement*.

Table 7

Percentage of students who engaged in social presence behaviors

Social Presence (SP) Code	Subcategory	Percentage
Self-disclosure	Affective	95%
Compliment/agreement	Interactive	84%
Acknowledgement	Interactive	83%
Paralanguage	Affective	71%
Ask/request/inquiry	Interactive	67%
Emotion	Affective	65%
Social sharing	Cohesive	63%
Vocatives	Cohesive	55%
Greetings/salutations/social niceties	Cohesive	49%
Group references	Cohesive	48%
Humor/irony	Affective	34%
Disagreement/critique	Interactive	26%
Reference to resources	Cohesive	14%
Sarcasm	Affective	2%
Complaint	Interactive	2%
Chastisement	Interactive	0.3%

Table 7 shows the percentage of students who engaged in each social presence behavior. Almost all students (95%) engaged in self-disclosure, while most complimented or expressed agreement with other participants (84%) or acknowledged others' posts (83%). Over two-thirds (71%) of students used paralanguage to embellish their text-based

communication, while about two-thirds asked questions or attempted to continue the conversation thread (ask/request/inquiry, 67%), expressed emotion (65%), or shared information about their local environment (social sharing, 63%). Just over half (55%) of all students used vocatives in their posts, referring to other participants by name, while about half of students used greetings and other forms of phatic (purely social) expression (49%) such as closures, expressions of thanks, and social niceties, or made group references (48%). Approximately one-third (34%) of students used humor or irony, while about one quarter (26%) engaged in polite academic disagreement or critique. Several (14%) students made reference to resources or offered pointers to help peers succeed in the course while only a very small percentage (2%) of students complained or used sarcasm on the DBs, and only one student (0.3%) engaged in chastisement.

Student SPD in the three subcategories. Student social presence behaviors fell primarily into the interactive subcategory, followed by affective, and then cohesive behaviors (Figure 7). The most interactive students were in Teacher Four's sections (13-16).
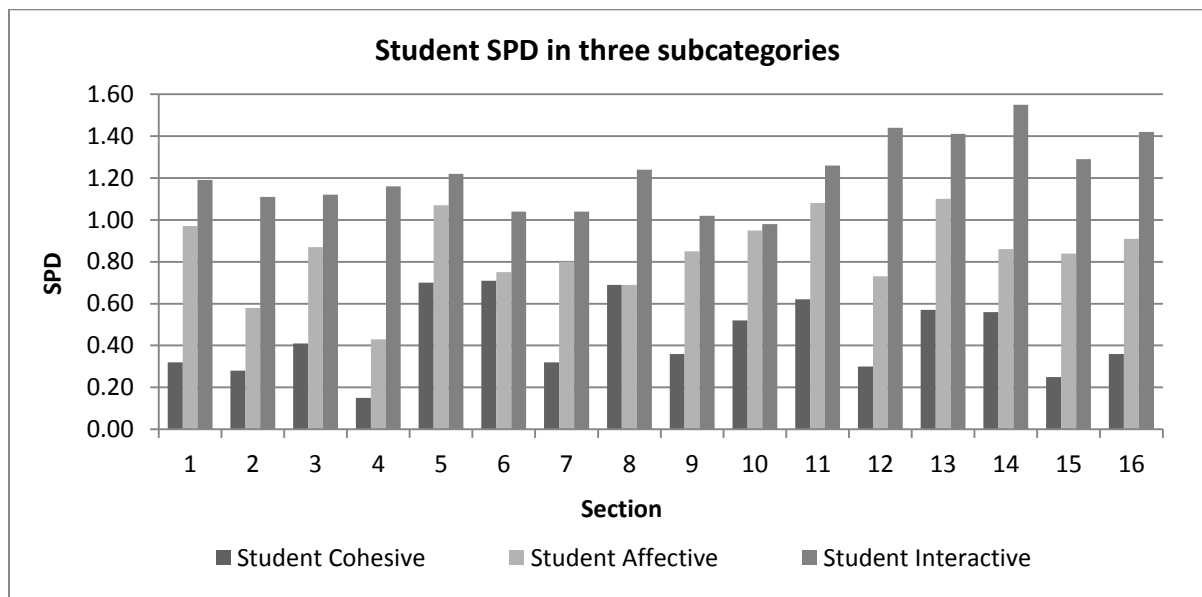

Figure 7: Student SPD in the three subcategories

Examination of individual social presence codes. A detailed examination of the 16 individual social presence codes follows, grouped by subcategory (cohesive, affective and interactive). As already noted, a message could have multiple codes assigned to it. Each quotation appears in this section because it offers an example of a particular code, although the message might also have been coded with other social presence indicators.

Cohesive Codes. Cohesive language contributes to group commitment or presence (Kucuk, 2009). The following five figures (9 through 13) show the SPD for the individual codes in the cohesive sub-category.

Reference to resources. Figure 9 shows the *reference to resources* code, for students and teachers. In the ESP model the definition of the code is broader than in the original COI model, encompassing both references to external resources and comments that reference resources within the course or offer pointers on how to be successful. Sections 5-8 (all taught by Teacher Two) had the highest student SPD for this code.
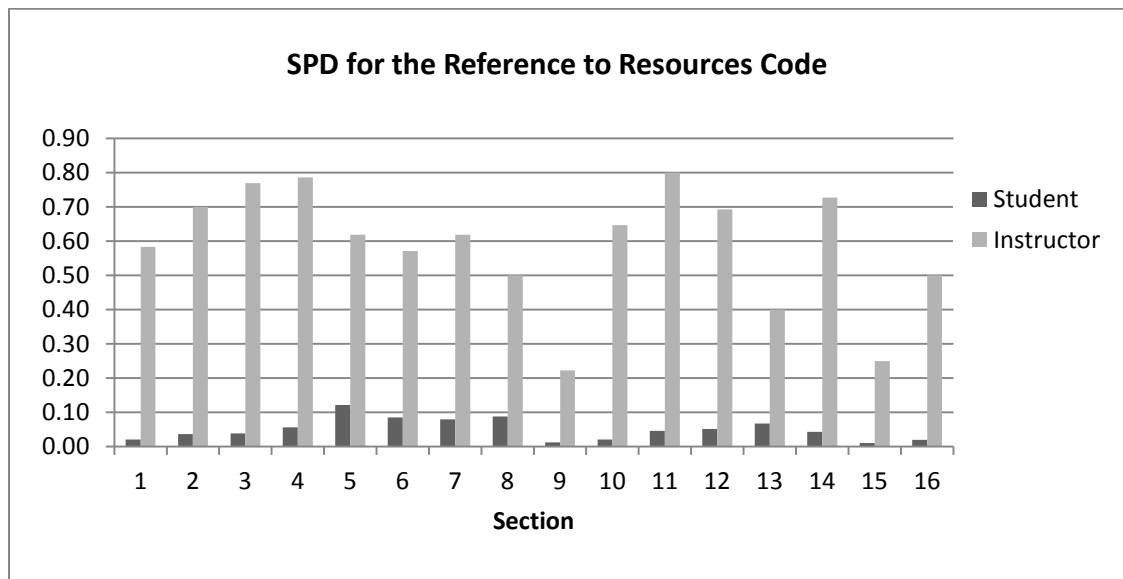

Figure 8: SPD for the *reference to resources* code

Some examples of messages to which this code was applied include:

There is a definition of what southern literature is: 'Southern literature is defined
as literature about the American South, written by authors who were either brought up
in the South, spent many years in the South, or came from southern parents.'

The first discussion board was only worth 25 points on purpose. I know it is
something new to get used to, so we eased you in a little. You can make up those
points by doing well on the current and future DBs. Just fulfill the requirements and
follow any advice I give you to help you succeed… (Teacher).

Greetings/social niceties. Figure 9 shows the SPD for the greetings/social niceties

code. Sections 6, 11, and 13 were high for students while sections 1-4 (all Teacher One)

were low. Teacher Three in section 15 had a particularly high SPD for this code. The

greetings/social niceties code covered a wide range of phatic expressions, for example:

"You're welcome, and thank you for the encouragement I received."

"I'm sorry that you had so much trouble with the poems."

"Thank you for your insight!"

"Hey everyone!"

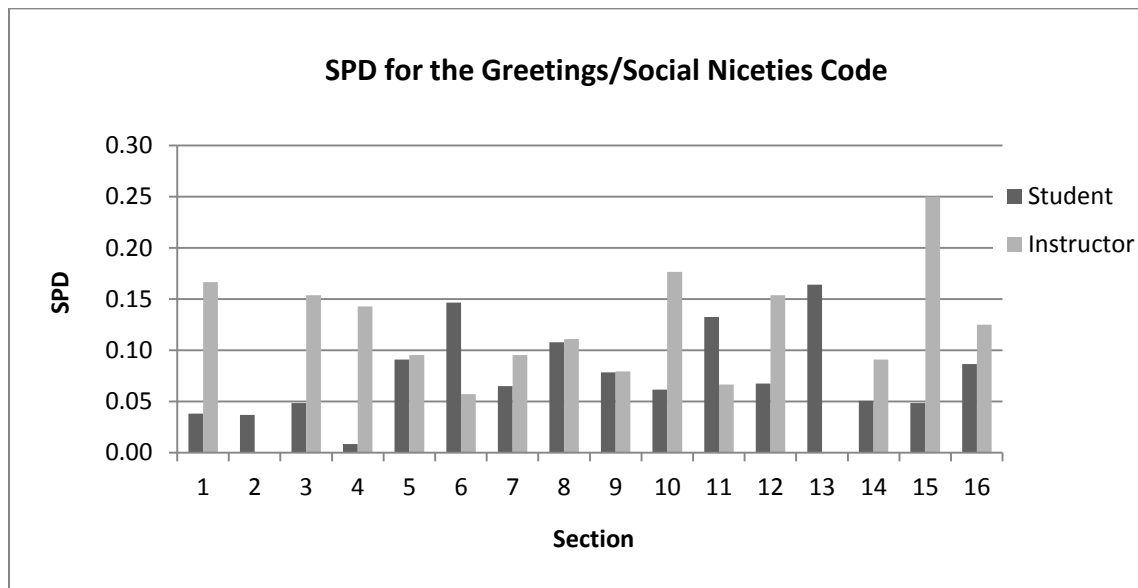"Sorry I'm not going to be any help on this one..."

Figure 9: SPD for the *greetings/social niceties* code

71

Group references. Figure 10 shows the SPD for the group references code. This captures messages that included references to the class members as a group, such as the use of "us", "we," "our," etc., or acknowledgement of the whole class as a group, e.g. "everyone," "everybody." Sections, 11, and 13 were high on this code for students while sections 1-4 (all taught by Teacher One) were low. Teacher One (sections 1 to 4) had a particularly high rate of group references in her sections, while Teacher Four in section 14 was also high for this code. Some examples of the group references code include: "Maybe once we have spent more time in the class we will become better at taking these difficult tests," "Surely by the end of this class we will be able to look back on those readings and look at them as if they are picture books," and "Everyone in this class has to be intelligent or they wouldn't have allowed us to take it, so congratulations to everyone."
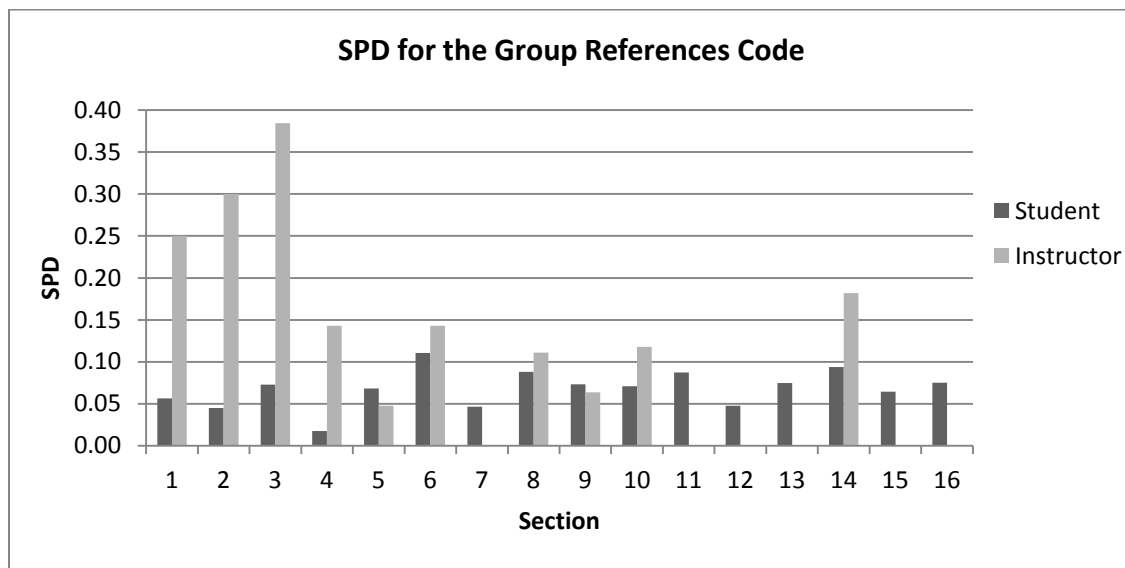

Figure 10: SPD for the *group references* code

Social sharing. Figure 11 shows the SPD for the social sharing code. Social sharing includes any reference to any aspect of the local environment experienced by the author of the message. For students, sections 10, 13 and 14 were high on this code, while sections 4

and 7 were low. Teacher One had a high level of social sharing in sections 1, 2, and 3, while

the other teachers only occasionally shared social information about their environment. Some

examples of social sharing include:

> I wouldn't say that all curiosity is dangerous, but it can be in certain situations. Like
> when my sister wanted to see what would happen if she sat on me while I was asleep.
> Normally that would have been very dangerous for me, but, unfortunately for my
> sister, my chihuahua happened to be asleep with me, and jumped and bit my sister on
> the nose.

> My grandparents come from Kentucky. My mom's side of the Kentucky family is
> extremely judgmental. If anyone is the least bit eccentric at all, they're automatically
> pinned as being crazy. My dad's side of the Kentucky family are just plain nosy.

> I live in a relatively average town… average people, average jobs, average drugs,
> average kids having unprotected sex...you know, that kinda thing.

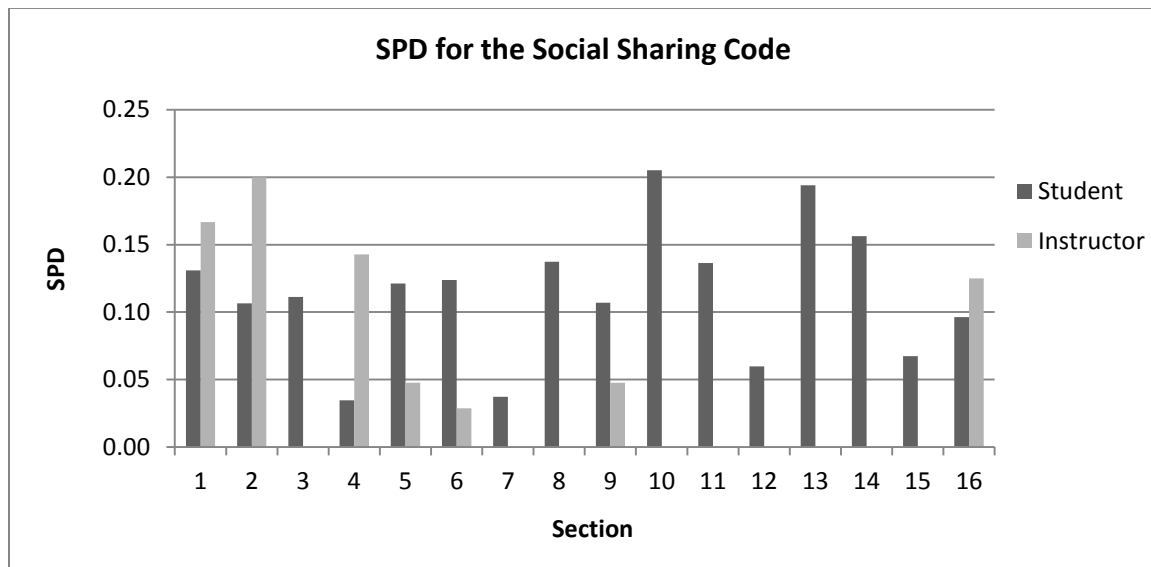*Figure 11*: SPD for the *social sharing* code

Vocatives. Figure 12 shows the SPD for the vocatives code. This captures messages

where the author refers to another participant by name. Sections 5, 6, and 8 (all taught by

Teacher Two) were high on vocatives for both students and the teacher, while sections 2 and

4 were particularly low for students. Teacher Two had much higher levels of vocatives in

her communication than any of the other teachers. Teacher Four (sections 13-16) did not use vocatives at all.
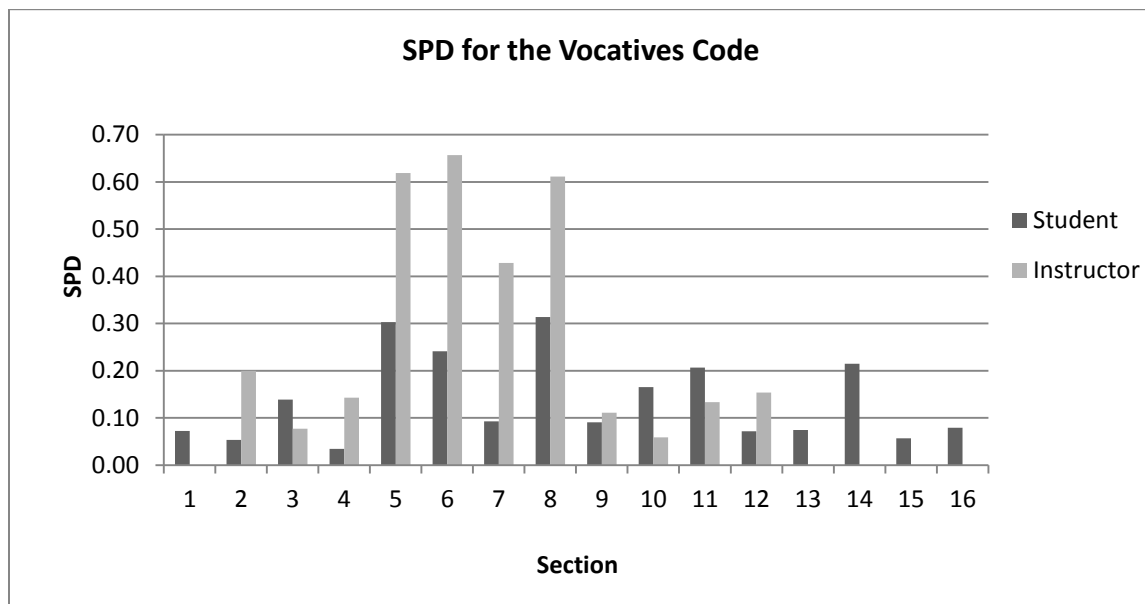
Figure 12: SPD for the vocatives code

Affective codes. Affective codes are indicators of personal presence or immediacy (Kucuk, 2009). The following five figures (14 through 18) show the SPD for the individual codes in the affective sub-category, with examples from the DBs to illustrate these.

Emotion. Determining when a post expressed emotion was not as straightforward as coding some of the other types of social presence indicator, and this is reflected in the low inter-coder reliability score for this code (Appendix D). Emotional messages were often embellished by the use of paralanguage, and frequently directly mentioned an emotional state, e.g. love, frustration, excitement or enjoyment.

Figure 13 indicates that Teacher One had the most emotional communication style, although none of her messages in section 1 contained indicators of emotion. Teacher Two expressed emotion in two of her sections, while teachers 3 and 4 each expressed emotion in only one section. For students, sections 10 and 11 had the greatest SPD for emotion, while

74

section 9 had the lowest. It was not always easy to determine when the author of a post

meant to be humorous, ironic, or was expressing emotion through an examination of the text.

Students would often embellish such messages (by use of paralanguage) or add a qualifying

statement after a humorous or ironic comment in order to convey the meaning more clearly,

but coding text for these indicators was a more subjective exercise than for some of the other

codes. This is reflected in the low inter-coder reliability scores for the emotion and

humor/irony codes.
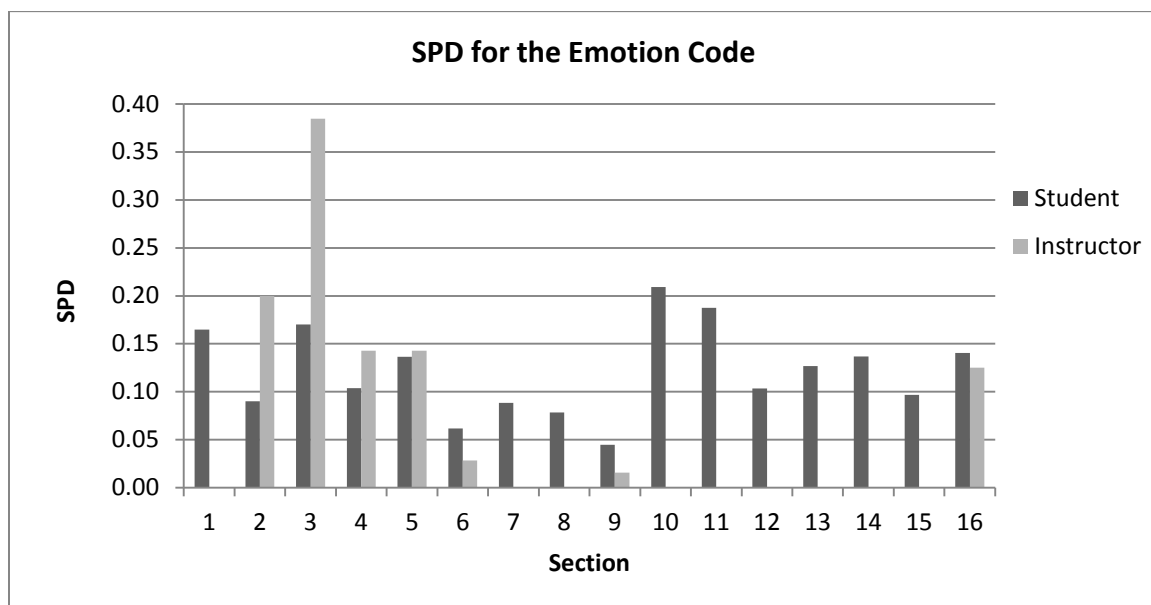
Figure 13: SPD for the emotion code

Some examples of the emotion code include:

> I hope I did not hurt your feelings. I am sorry. I did not mean to take offense to that.
> I've had a rough week and that was a little surprising. I can respect people's opinions,
> no matter how positive or negative. It was just a little shock but I am over it now.
> Let's forget about it and move on.

> I must chime in to say that Gatsby is one of my all-time favorite books! The
> language is almost musical. But, ohh, that Tom is awful, and Daisy, too, for that
> matter! (Teacher)

Humor/irony. Figure 14 shows that only teachers 1 and 2 used humor or irony in their messages, with Teacher One being the most likely to do so. Section 1 had a high humor/irony SPD for both students and teacher, while sections 10 and 11 were also high for students.
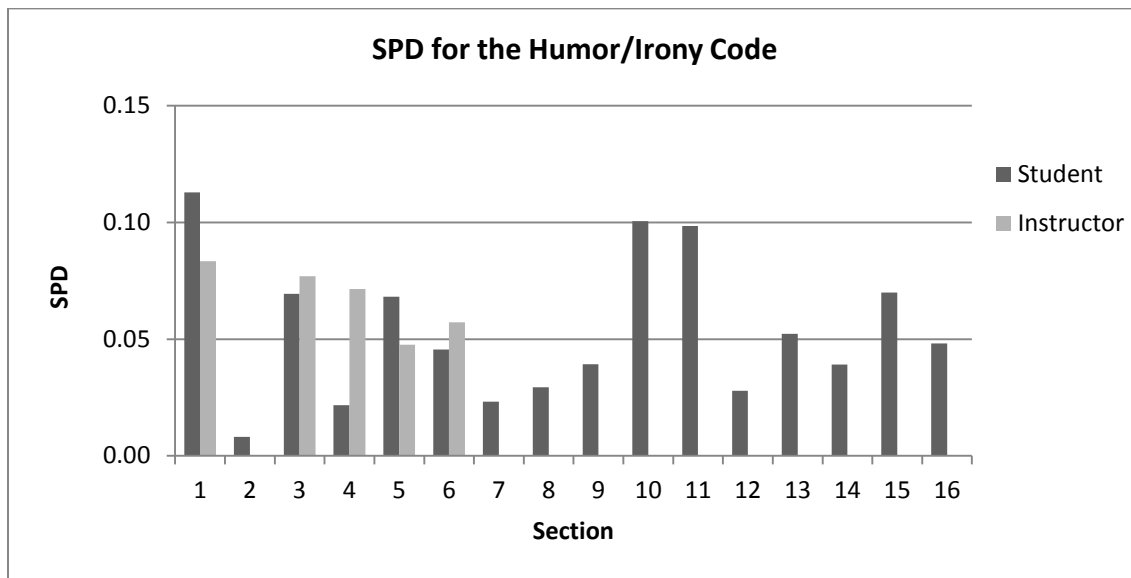
Figure 14: SPD for the humor/irony code

Some examples of the humor/irony code include:

You may just have convinced me to head out to Barnes & Noble to give them more of my money. :)

When reading the story I had the sense of it coming from the South. My main reason for this is that Miss Emily came from a very well-to-do family and she had a black servant that stayed with her throughout the entire story. Not too many people from the North would have a black servant that would stay freely with a crazy woman and her rotting lover.

Sarcasm. The sarcasm code was included with the humor code in the original COI social presence model. It has been coded separately for this study in order to be able to look at possible effectives of negative social presence. While students in several sections did use sarcasm, it occurred in less than 1% of the messages. Figure 15 indicates that only Teacher Two used sarcasm. Nine out of the 16 sections had no sarcasm at all.
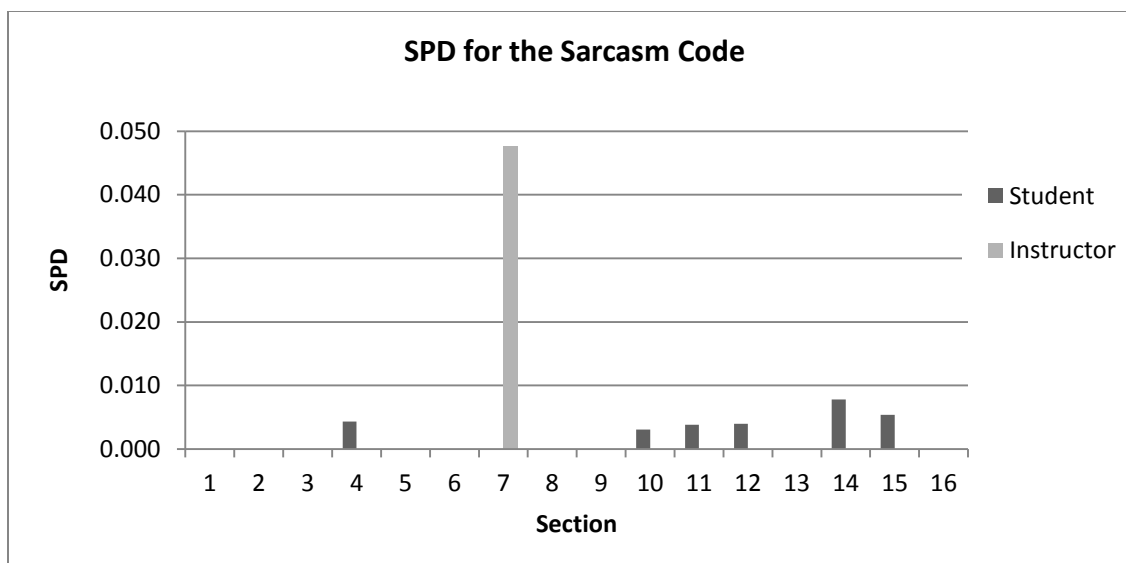
Figure 15: SPD for the sarcasm code

Some examples of sarcasm include:

Well thank you for telling me what kind of person I really am. I am glad I realized that I am an overbearing, omnipotent person now before I provided another viewpoint.

This post was designed for intelligent response. In the case you couldn't figure it out, since you probably can't, this means Do Not Post Here. When you have something remotely interesting to say, email me…

But hey, she can "raise" kids and "run" the ever so populated state of Alaska, you know, telling who to catch fish and who to drill for oil. So she obviously will make a great president when McCain dies of old age during his presidency. Yeah... very comforting.

Paralanguage. Paralanguage refers to any embellishment of the text – including use

of different fonts, different colors or text size, emoticons ("smiley faces"), use of italics or

bold text, typing in all capitals, deliberate misspellings, embedded image files, use of special

characters, words used for emphasis, e.g. "Wow!", and contractions and acronyms typically

used in texting, e.g. "lmao" or "lol." Figure 16 shows that Teachers One and Two used

paralanguage in all their sections, and in some cases more than their students. Teacher Three

used paralanguage in two of her sections (10 and 11), although at a much lower rate than her students, while Teacher Four used paralanguage only in section 14.
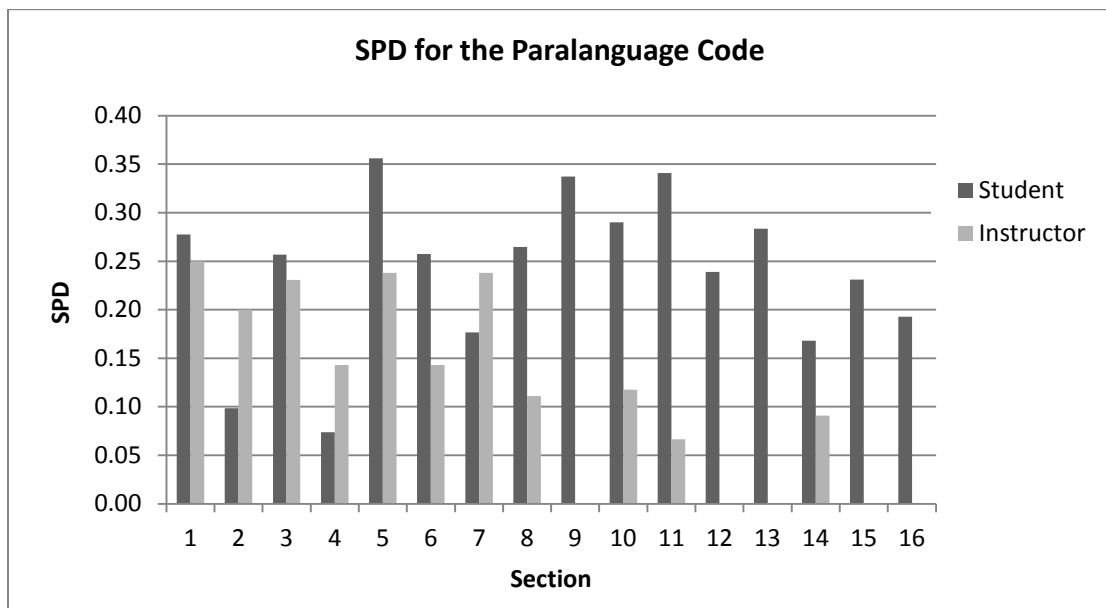
Figure 16: SPD for the paralanguage code

Some examples of the paralanguage code include:

> I was fortunate enough to be an avid reader and writer and a bit of a grammar nerd. :P So I'm looking for some good jokes. Anyone have any that would make me bust a gut? =) lol.

> ...initiations!? We have what we call the DQ Daiquiri, the coffee concentrate (for the moolattes) and pickle juice! AHHH GROSS!!! :):):):):):):):):):):)::):):):):):):)

> *Self-disclosure.* The self-disclosure code was used to describe any message where the author disclosed personal feelings, thoughts or behaviors, or expressed vulnerability. Self-disclosure was the code most frequently used by students overall (Figure 17). Among teachers, teachers 1 and 2 used this code most often, while Teacher Three was less likely to use it and Teacher Four only used it in one section (14). The students in sections 13-16, all taught by Teacher Four, were most likely to use self-disclosure in their communications.

SPD for the Self-disclosure Code
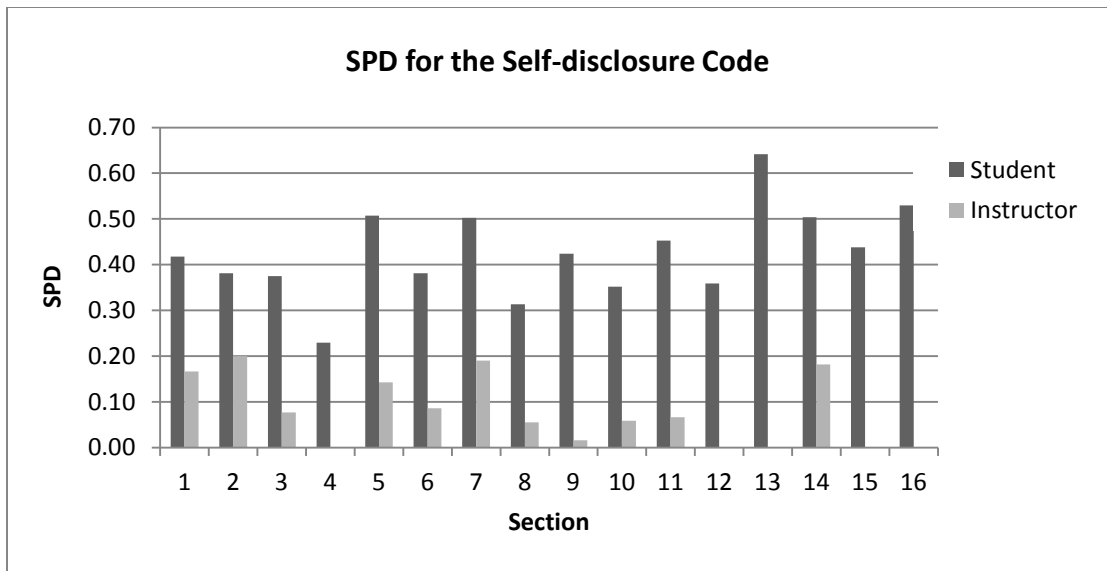
Figure 17: SPD for the self-disclosure code

Some examples of the self-disclosure code include:

I read, write, paint, make collages, play violin, stare at the stars while contemplating life on other planets, hug random-usually old-people, sometimes get angry for stupid things, am responsible, honest, overanalyze things, sometimes think that I evah typing dyslexia, love to listen to music, think that MTV is the epitome of satan, always end up giving lectures on topics relating to something like civil rights, try to act smart even though I'm not, attempt to hold discussions on quantum and classical physics, and draw-usually all over the pages of my classwork…

You are not the only one!!! I did really bad on the test, and had trouble understanding the second reading...

Interactive codes. The *interactive* codes indicate that participants are aware of and are responding to each other (Kucuk, 2009). The following six figures (19 through 24) show the SPD for the individual codes in the interactive sub-category, with examples from the DBs to illustrate these.

Acknowledgement. Figure 18 compares student and teacher SPD for acknowledgement (directly referencing another's post). This was a frequently applied code because any message containing a compliment/agreement or disagreement/critique was simultaneously an acknowledgement. Teachers were more likely than students to include

acknowledgements in their messages, with Teacher Four (sections 13-16) being particularly likely to do so.
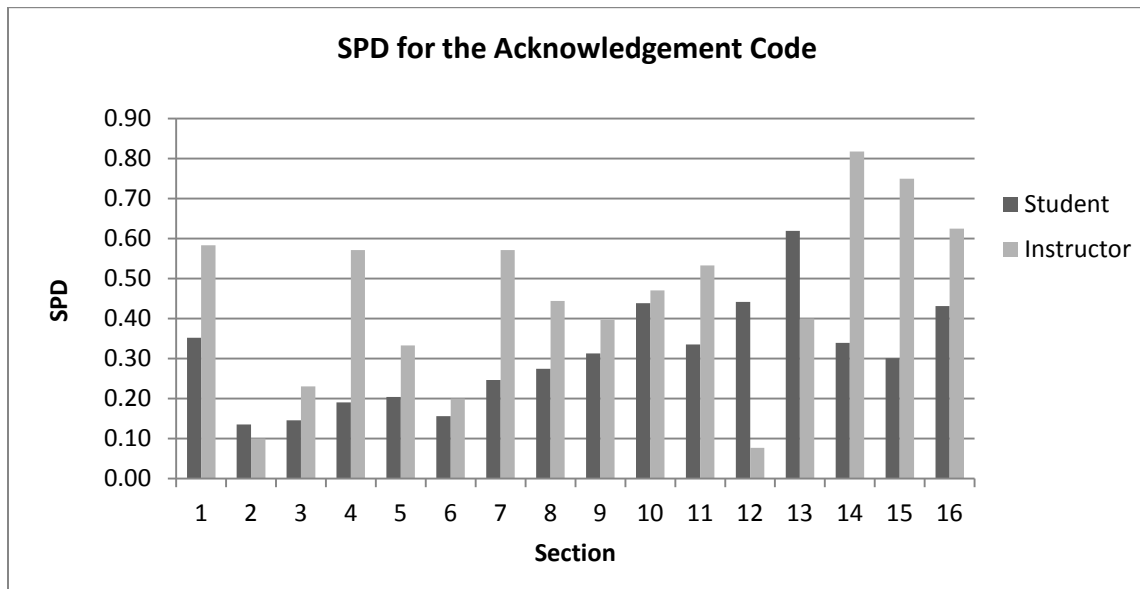
Figure 18: SPD for the acknowledgement code

Some examples of acknowledgement include:

You make a valid point about the attitudes in southern towns.

You make 'The Equipment' sound very interesting and I would really like to read it.

I know someone who did that... except it was a safety pin instead of a clothes hanger.

Ask/request/inquiry code. The ask/request/inquiry code was used to indicate any attempt by a participant to draw others into continued discussion. This included any form of question, specific and open-ended, to which the participant was seeking a response. Sometimes questions were aimed at a specific individual, and sometimes they were addressed to the whole group. Students in section 14 were most likely to invite further discussion by asking questions. Figure 19 shows that among teachers, Teacher Two most consistently invited further discussion by asking questions of her students, while Teacher Four in section 15 asked questions of students in 50% of her messages.
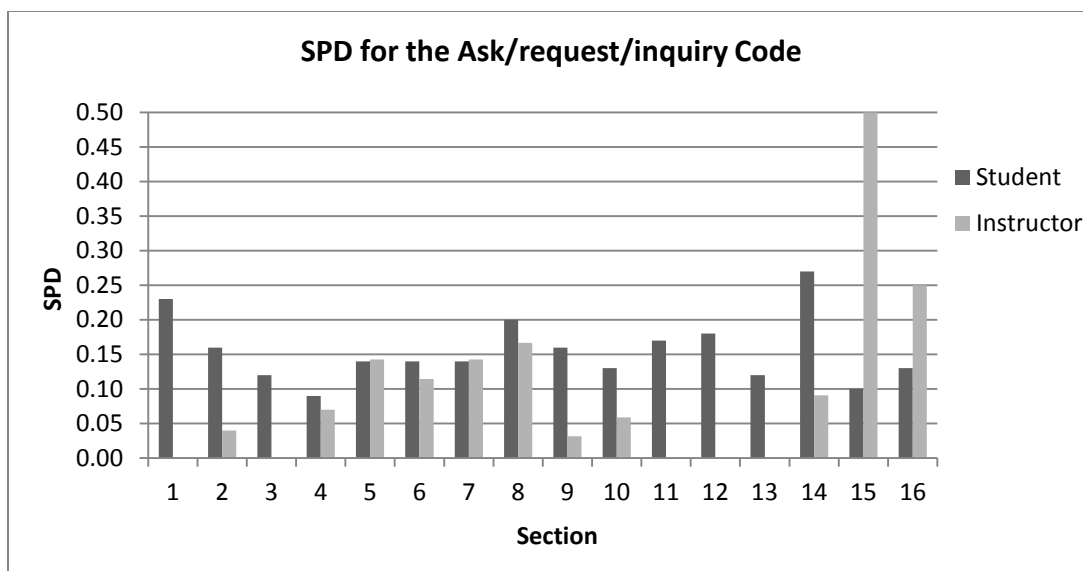
Figure 19: SPD for the ask/request/inquiry code

Some examples of ask/request/inquiry include:

Any other big athletes in here?

If someone could enlighten me as to the meaning of the question or to what

"apostrophe" is even referring to, it would be much appreciated.

What exactly is your role as queen of your high school??

Chastisement. Beuchot and Bullen (2005) included a chastisement code to

differentiate hostile exchanges on the DBs from polite or academic disagreement (captured in

the disagreement/critique code). In the high school setting, hostility was rare and usually

took the form of a sarcastic comment. Therefore this code was used primarily to indicate

chastisement in the form of "scolding," which almost always came from the online teacher.

There was only one instance of chastisement of peers by a student (in section 7), who

admonished them for making what she considered to be stereotypical statements. Figure 20

indicates that only Teachers One and Two chastised their students, and Teacher Two was

more likely to do so.

SPD for the Chastisement Code
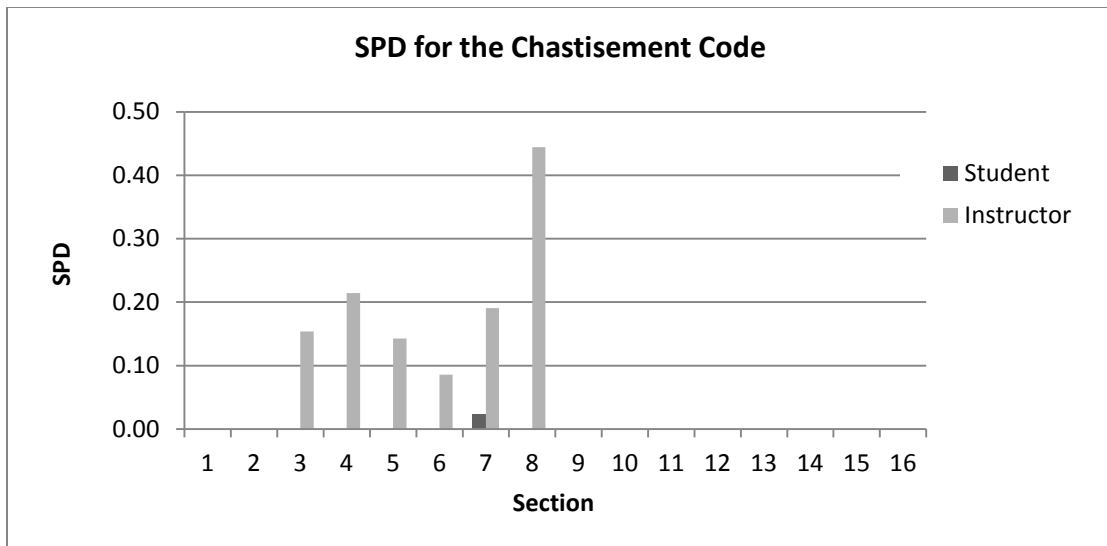
Figure 20: SPD for the chastisement code

Some examples of chastisement include:

> The only reason I am going to leave this post up is to demonstrate to the rest of the class exactly what you are **NOT** supposed to do in Discussion Boards.
> Please refrain from making irrelevant posts to graded discussion boards in future.

> Overall I am disappointed with the participation in this discussion. Despite my post on the night of the first day of the discussion boards that attempted to steer you in the right direction by reminding you of the requirements of this discussion board, most of you did not attempt to meet these requirements.

Complaint. The complaint code (Figure 21) was added to the original COI social

presence model because, as noted previously, "the underlying social strategy of much

complaining behavior in the community is not negative but positive in nature" (Boxer, 1995,

p219). This code was only applied to student messages because there were no instances of

complaint from teachers. Some examples of complaint include:

> I did question number seven wrong. I got it wrong because social was on there twice and I hadn't realized that. I think it's very deceiving because someone could have marked "all of the above" and got it wrong because social is an answer twice.

> Am I the only one having trouble in this class? I do all the work and feel I did a good job and then I look at my grades and everything is really low. Anyone know how I can get a better grade, besides something stupid or simple

I agree. I have never been able to comprehend what they are talking about. And in the end I get bad grades because I took the message differently.

SPD for the Complaint Code
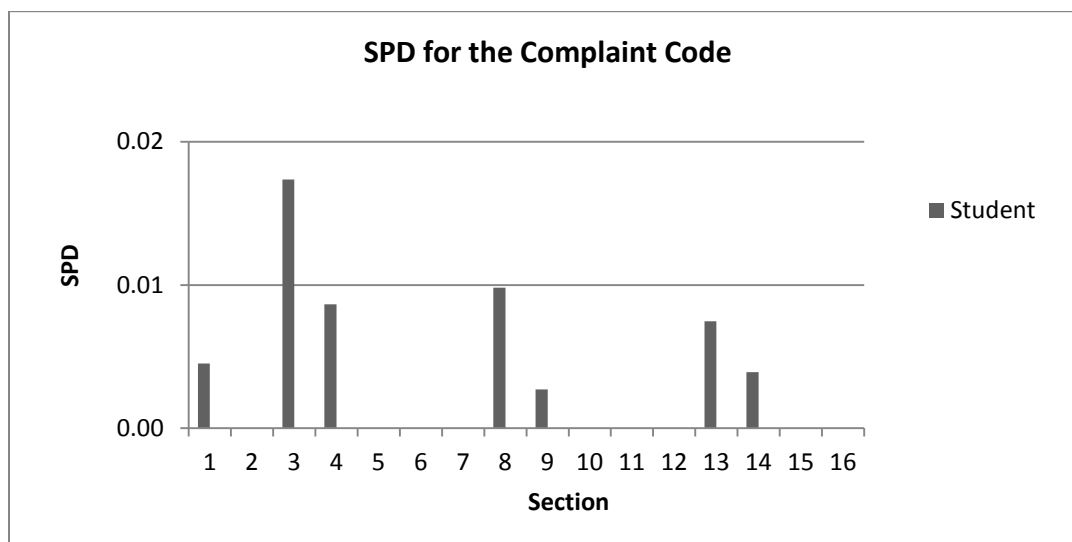
Figure 21: SPD for the complaint code

Compliment/agreement code. The compliment/agreement code was used to indicate wherever a participant explicitly agreed with a post, or complimented another participant. Figure 22 shows that among teachers, only Teacher Two used compliment/agreement in all her sections. Section 5 (Teacher Two) has high rates of the compliment/agreement code for both students and teacher; it occurs in over 40% of the messages. The students in sections 9-12, taught by Teacher Three, generally showed lower usage of compliment/agreement than students in other sections. Some examples of the compliment/agreement code include:

I agree with you completely on this book. Very well put. I like the way you linked the smell of disuse and the cracked leather to Emily's life.

I completely agree. In all of my years taking English, I do not think that literary device apostrophe was mentioned at all.

SPD for the Compliment/Agreement Code
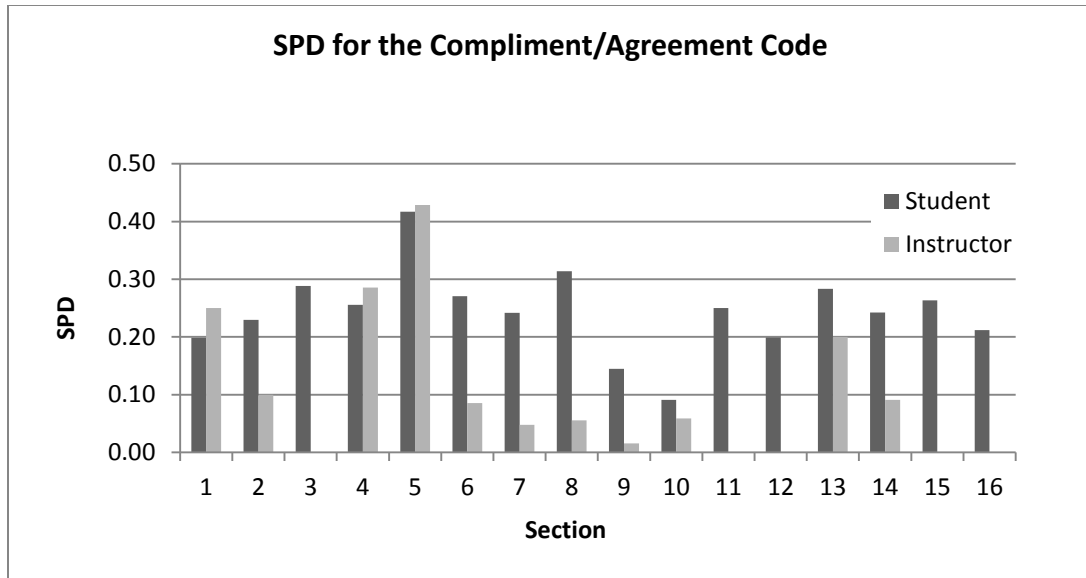
Figure 22: SPD for the compliment/agreement code

Disagreement/critique code. The disagreement/critique code (Figure 23) refers to polite or academic disagreement or critique, and as such was not considered to be a "negative" code. However, this code was typically used in less than 2% of student messages, with only a few sections using it more frequently. Section 6 had the highest rate of disagreement, and was the only section where the teacher included a critique.

SPD for the Disagreement/Critique Code
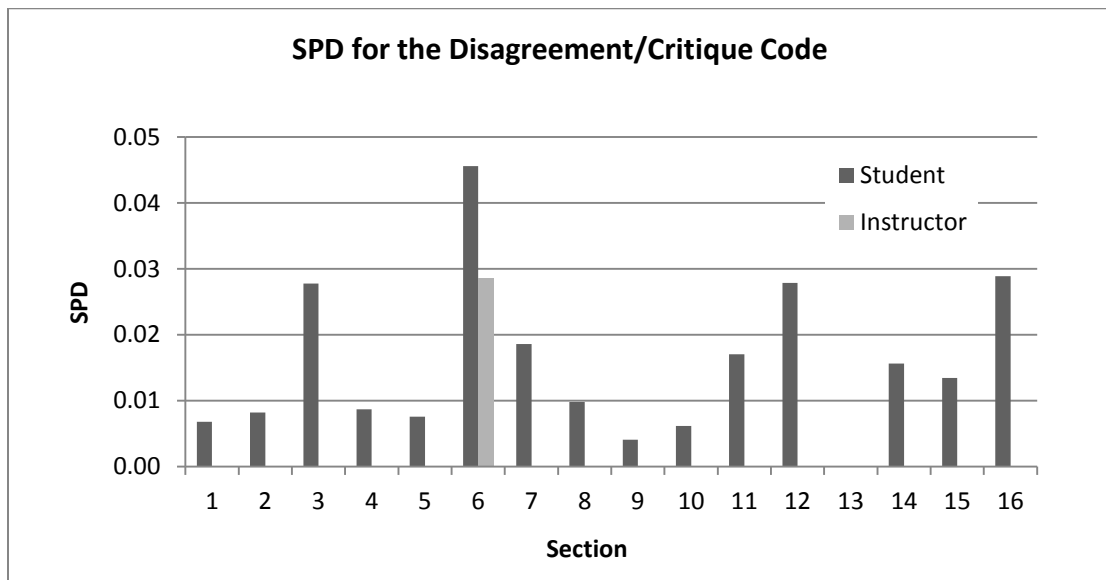
Figure 23: SPD for the disagreement/critique code

Some examples of disagreement/critique include:

> I must disagree with the previous post. Jonathan Livingston Seagull tells of so much more than working to achieve one goal. It tells of how one can find peace and contentment within oneself, how to just be.

> I completely disagree that *Romeo and Juliet* demonstrates "true love." I think Shakespeare portrays a typical relationship of young teenagers of around 14 as being fickle and overdramatized.

> It is incorrect to say that it was not a severe crime to kill your lover in the South during that time period. They were the society that stuck to the "Noblesse Oblige." If a high society person married a low society person, the high society person would be shunned.

Summary of findings for the first research question. The social presence profile of each section was different, although broad patterns illustrated that students are primarily affective and interactive, while teachers are primarily cohesive in their online behaviors. Only a very small percentage of messages contained negative social presence behaviors (sarcasm and chastisement), or those behaviors that are not necessarily negative but indicate some kind of friction or tension (disagreement and complaint). Students' showed high frequencies of self-disclosure, paralanguage and acknowledgement of others' posts. In general teachers' demonstrated high levels of references to resources, acknowledgement, and vocatives. Distinct differences between teachers emerged, and are discussed in relation to the second research question, below.

Second Research Question

How do the social presence behavior patterns of individual teachers compare?

This section of the findings chapter examines the overall patterns of teacher social presence behaviors, followed by a detailed description of individual teachers' behaviors. Table 9 shows teacher social presence codes as a percentage of coded teacher social presence behaviors. Of all social presence behaviors exhibited by teachers, more than one-quarter

(27%) were *references to resources*, i.e., suggestions about resources that might be helpful or tips on how to be successful in the course. Acknowledgement, an interactive behavior, occurred in 20% of teachers' messages, while the use of vocatives occurred in 13% of teachers' messages.

Table 9

Teacher Social Presence Behaviors

Social Presence (SP) Codes	Percentage of All Teacher SP Behaviors
Reference to resources (SP1)	27.10%
Acknowledgement (SP11)	20.40%
Vocatives (SP5)	13.10%
Paralanguage (SP9)	5.60%
Group references (SP3)	5.20%
Greetings/salutations/social niceties (SP2)	5.00%
Ask/request/inquiry (SP12)	4.80%
Compliment/agreement (SP15)	4.70%
Chastisement (SP13)	4.10%
Self-disclosure (SP10)	3.80%
Emotion (SP6)	2.70%
Social sharing (SP4)	2.20%
Humor/irony (SP7)	1.10%
Sarcasm (SP8)	0.20%
Disagreement/critique (SP16)	0.20%
Complaint (SP14)	0%

Patterns of interaction for individual teachers. Each teacher had her own patterns of interacting in online discussion and these are described in detail in the following paragraphs, with examples of messages posted by teachers, as well as comments from teacher interviews at the end of the course. Teacher social presence behaviors (Figures 24-

27) fell primarily in the cohesive subgroup, followed by interactive behaviors, with generally low levels of affective behaviors.

Teacher One (sections 1-4). Teacher One was a low activity, high social presence teacher who contributed 3-6% of all the messages in her sections. Overall, Teacher One posted approximately 25% of her messages on each of the office, ice-breaker, and academic 1 DBs with approximately 15% on the academic 2 DB, and 10% on the social DB. She was the only teacher who attempted to "strike up a conversation" by asking questions about students' interests and lives outside of the course. The other teachers would sometimes invite content-related discussion or prompted students to think critically about course materials, but did not appear to be attempting to build a personal relationship with students. While all teachers divulged at least some information pertaining to activities or behaviors outside the online course, these tended to reference other classes or other books they had taught. Teacher One was the only teacher who shared personal stories and experiences. She would often include details about her personal life (beyond her teaching role) and would use emoticons and other paralanguage to express emotion. Some examples of her posts are: "I try not to post in [social board] very often, but I had to pop in to this discussion. :-)" and "Grrr! It makes me so mad for the screenwriter to totally change a character and a plot point like that!"

Teacher One was cognizant of the potential for misinterpreting the tone of discussion board content, as illustrated by this comment to students: "I am not trying to sound mean. If you could see me, you would see that I have a caring/concerned look on my face, not an angry one." Her responses were sometimes lengthy, consisting of multiple paragraphs, and she would frequently invite further conversation or continue an existing conversation, e.g.,

I am glad to learn that you felt comfortable with the first part of the AP multiple choice. What made this part easier for you? What are some of the items that you were able to answer with ease and what strategies did you use to answer them?

Teacher One stated in the interview after the end of the study that she believed online discussion is an integral part of this type of course: "It helps the students interact. Otherwise we are just giving them something to read and testing them later." When asked about her own contributions to the DBs, she said that although the DB could not have functioned without her as a moderator, and she did monitor the DBs to make sure students were not getting off topic, she tried *not* to be an active participant. This was because she was worried that students "would not think for themselves," instead choosing to wait and hear what she had to say. She believed that students often prefer online discussion to face to face discussion. In this study, her experience was that many of her students were not prepared for the rigor of AP, and were more used to recalling rather than analyzing information. She would give them pointers on the DBs when they were struggling, and she felt that some did improve over time.

Figure 24 shows the social presence subcategories for Teacher One, by section. The pattern of interaction was similar across sections, with interactions being primarily cohesive, followed by interactive, and then affective. Teacher One displayed the highest levels of affective behaviors of all the teachers. In section three Teacher One was less interactive and more affective than in her other sections. Compared to the other teachers, Teacher One exhibited high levels of greetings, group references, and social sharing (all cohesive behaviors) as well as emotion, humor, and paralanguage (all affective behaviors). In the interactive subcategory, Teacher One displayed relatively high levels of chastisement compared to other teachers, as well as high levels of compliment/agreement.
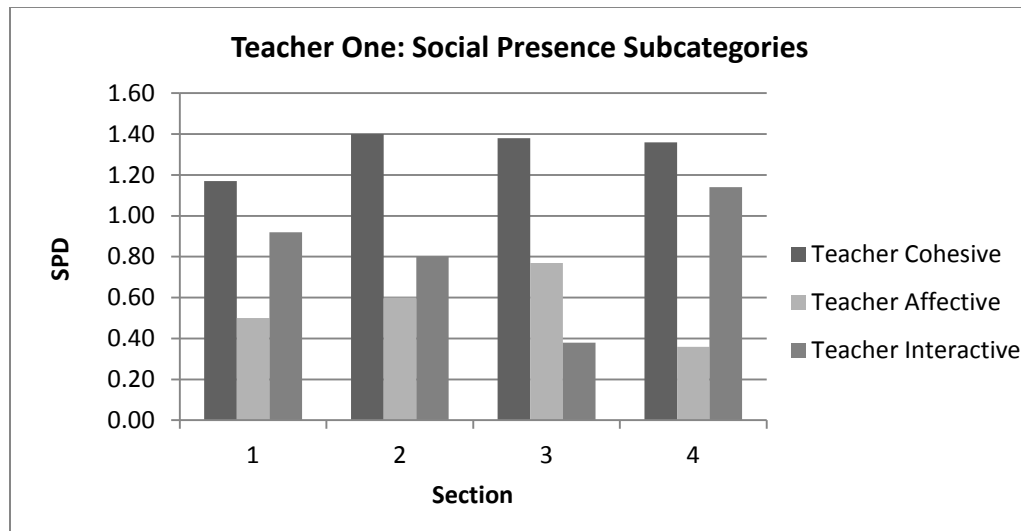
Figure 24: Teacher One: social presence subcategories

Teacher Two (sections 5-8). Teacher Two was a high activity, high social presence teacher, who contributed 10-18% of all the messages in her sections, and was the most active teacher in the cohort. She generally would comment only at the end of an assignment, but then would give detailed individual feedback to each student, by name, with pointers about how to improve on their responses. Her extremely high use of vocatives in her messages was associated with high vocative use by students in sections 5, 6, and 8. This teacher would sometimes be sarcastic or harsh in tone, e.g., "As of today, I have not gotten a single message from you, including the one where you introduce yourself to me. Perhaps you should start there." Teacher Two would sometimes give praise, e.g., "This is excellent work. I look forward to reading your future posts," and apologized for her mistakes, e.g., "Sorry! I forgot to open the submit window this morning." She frequently invited further discussion by asking questions, and often posted lengthy messages with pointers about how to succeed in the course:

> Sometimes you will have to turn in journal entries and sometimes not. You will not know ahead of time which entries I will take up. I can tell you the most zeroes last year came from people who did not have the assigned journal entry done when I

collected it. Some students have the idea 'if it is not going to be collected, it does not really have to be done.' The purpose of the journal is to give you a study guide for the AP Exam.

Teacher Two mentioned some of her DB strategies during her interview: "At the end of most discussions I posted DB grades. Sometimes I posted in the middle telling them the direction they were headed e.g. 'this is all positive here, or nobody has done this …'" She would monitor the progress of the discussion and if students were off-topic she would interject: "At some point I would say 'everyone read my response because you are all making the same mistake here' and I would model appropriate responses." However, she lamented that a number of students "would have 72 hours to post and would wait until the 71st hour. They get flabbergasted when they are two days late and they get a zero: 'We did the work, doesn't it count?'"
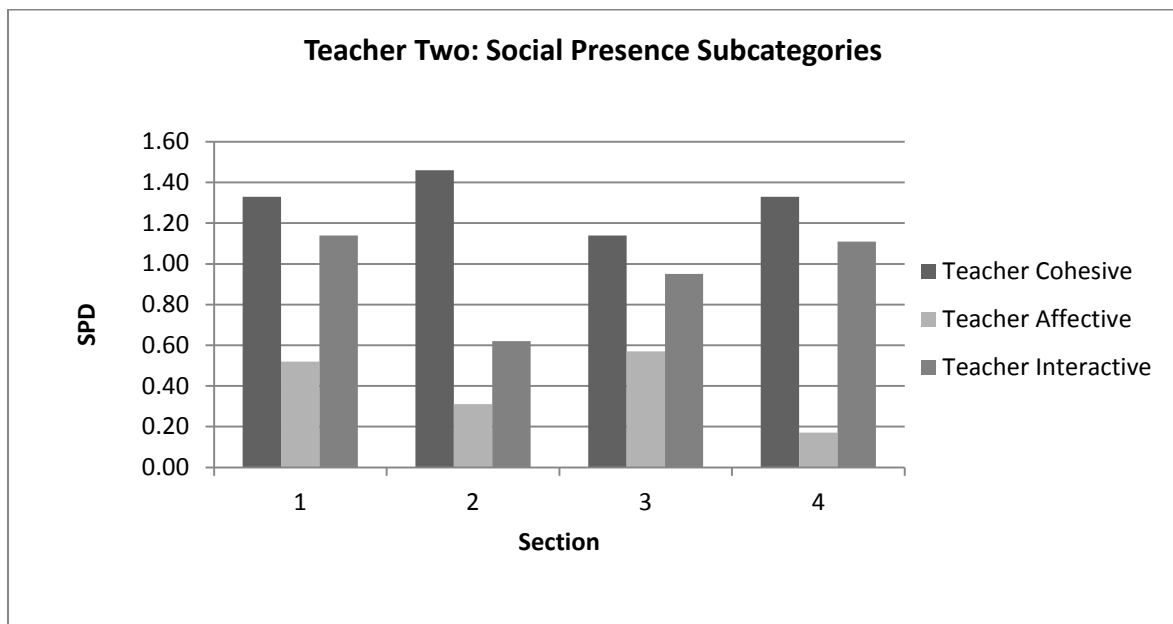

Figure 25: Teacher Two: Social presence subcategories

Figure 25 shows the SPD in the social presence subcategories for Teacher Two. The patterns are similar across sections, and also to those of Teacher One: primarily cohesive behaviors, followed by interactive and then affective. Teacher Two displayed particularly

90

high levels of vocatives, humor, sarcasm, paralanguage, and chastisement. She also displayed consistently high levels of ask/request/inquiry across her sections – asking questions of her students in order to facilitate further discussion.

Teacher Three (sections 9-12). Teacher Three was a low social presence teacher. Although she was the second most active teacher in number of posts, she contributed only 2-5% of the messages in her sections because her students were extremely active. She tended to give very short responses on the DBs, often consisting of just a few words, e.g., "Attached is the rubric, and student examples," "Yes, you're right, Jennifer," and "It would be helpful to consider both." Longer responses were typically informational in tone rather than conversational, and rarely invited further discussion, for example:

> In general, to be better prepared, you should read more closely and take notes as you read. Creating a character chart might also help along with plotting their development. Also, pay attention to references and allusions, such as the Emerson allusion; they are often used to convey theme and characters' attitudes, opinions, and beliefs.

Teacher Three would sometimes refer to students by name and only very occasionally would offer a compliment. She acknowledged that some students were struggling, but did not offer any personal encouragement, for example:

> When figured in with other grade categories, this score would count as 40 percent of your total grade. And although some of you may be doing poorly on quizzes right now, there are usually other classroom or homework assignments that will offset those poor grades.

Teacher Three in her interview said she believed that students used the DBs to learn from each other about "new ideas, different perspectives… they discuss and construct knowledge on their own – it's more meaningful. They enjoyed meeting new people from different schools. The social atmosphere is their learning environment." She saw her role as a moderator of discussion, and while she believed her contributions were important ("I was

91

going in, commending them – it builds their confidence") she did not want her contributions to "stifle them or shut down the conversation too quickly."

Figure 26 shows the SPD in the social presence subcategories for Teacher Three. The patterns across sections are similar, e.g., cohesive followed by interactive with very low levels of affective behaviors (and none in section 4), although there was a wide variation in the interactivity across sections.
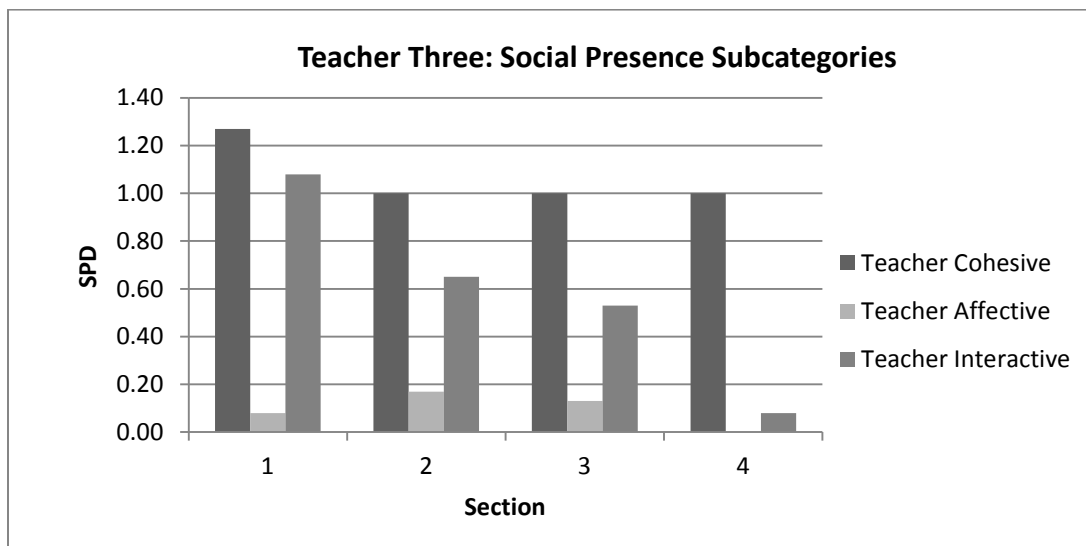
Figure 26: Teacher Three: Social presence subcategories

Teacher Four (sections 13-16). Teacher Four was a low social presence, low activity teacher, who contributed only 1-4% of the messages in her sections. Although she posted relatively few messages, she had the highest interactive SPD of all the teachers. She frequently invited further discussion by asking students to respond to questions and encouraging critical thinking and reflection on what they had read e.g.

> I, also, find Emily very sympathetic. Her father would not allow her to have a boyfriend or marry, and when he dies, he leaves her penniless. Emily had few options because of the time period in which the story takes place so Homer was her "knight in white armor". Did anyone pick up on the fact that Homer was not the marrying kind? What did Faulkner mean by that?

Teacher Four expressed empathy and acknowledged that students were sometimes feeling frustrated with the course:

> I know a lot of you feel frustrated and a little overwhelmed, but some of that is just becoming familiar with an online class. By the end of this week I believe you all will be comfortable with Blackboard, and that part will become easier. As for your feelings that you do not know much about poetry and that the AP MC was hard, we will spend this entire year building skills that will make this a lot easier or, at least, you will be prepared when you take the exam.

She also apologized for her own mistakes, e.g., "Actually I DID NOT read carefully when I was writing the announcement. I did go back and correct it later in the day. Sorry for the confusion" and sometimes praised individual students for their comments, e.g. "that was better than a good guess!"

In her post-course interview, Teacher Four said she felt that the DBs were an invaluable part of the course and without them students would have been limited to the perspectives of the peers in their local classrooms. She believed that having a larger class size affected the amount of discussion: "We had limited numbers of students in one section. Discussion would die very quickly. There just weren't that many ideas being thrown out there." The notion that class size affects activity in online learning is supported by at least one study (Hewitt & Brett, 2007). She also believed that those students who participated more on the DBs tended to be those who were "more active in every area, more engaged." Regarding her own contributions to the DBs, Teacher Four stated "I started by being active but ended up being a moderator. I found that my contributing just seemed to make the thread end." She felt frustrated at the lack of questions students would ask, despite the fact that she told students that she would be online during their class periods and could answer questions immediately: "only two or three took me up on that the whole year." Teacher Four was aware of student social presence: "I can tell so much about a person from the way they write.

93

Most of the correspondence, 99%, is written. You really get to pick up on their personalities."

Figure 27 shows the SPD in the social presence subcategories for Teacher Four. The patterns were different from those of the other teachers in the cohort in that Teacher Four's behaviors were primarily interactive (because of high levels of ask/request/inquiry). Section 13 had some missing data in the office discussion board, so the SPDs for that section may be lower than expected.
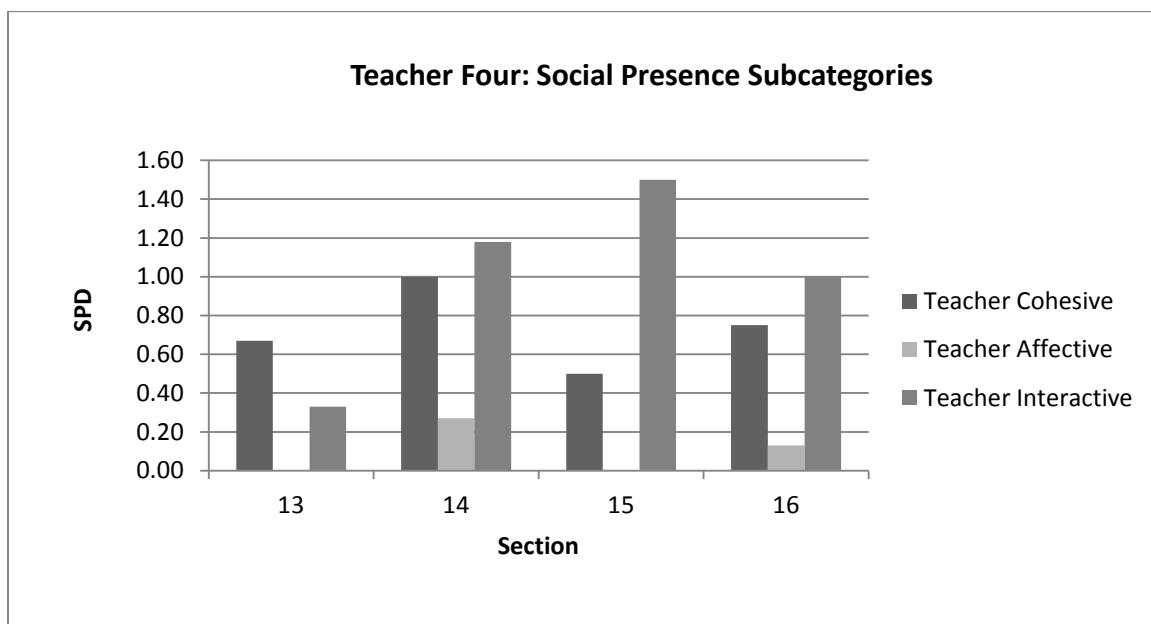
Figure 27: Teacher Four: Social presence subcategories

Summary of findings for second research question. Teachers claimed to moderate the boards rather than actively participate, expressing concern that they might stifle the conversation if they had too great a presence on the DBs. However, the form that this moderation took differed for each teacher. The findings indicate that each teacher had her own unique communication style and pattern of communication on the discussion boards and each teacher was noteworthy for different reasons. Teacher One had high social presence, was the most affective in style, and therefore could be considered the most sociable and

94

friendly teacher (Gorham, 1988). Teacher Two also had high social presence, but high rates of chastisement and sarcasm compared to the other teachers. She was the most active, posting more messages than other teachers. Teacher Three had lower social presence than the other teachers, a lower SPD than her students except in one section. Her students were much more active than those in other sections. Teacher Four was the most interactive in terms of social presence indicators, but posted far fewer messages than other teachers.

Third Research Question

To what extent, and in what ways, is social presence associated with student dropout?

This section of the findings chapter examines social presence and its relation to student dropout. Students who posted at least once on the DBs were considered to have started the course. Of the 331 students who began the course, a total of 121 (36.6%) dropped out. Figure 28 shows the section drop rate by the four-week point. Almost three-fourths (n=90) of these dropped the course within the first four weeks ("four-week drops"). An additional 31 students dropped sometime after the first four weeks ("later drops"). For each section, the drop rate at each time point was calculated by dividing the number of students who had dropped the course at that time, by the number of students originally in that section. All the students who dropped the course in sections 6, 7, 9, 12, and 15, dropped within the first four weeks. Section 8, with the highest drop rate (82%) had the highest chastisement rate of all sections, with 19% of the teacher's messages containing a chastisement.
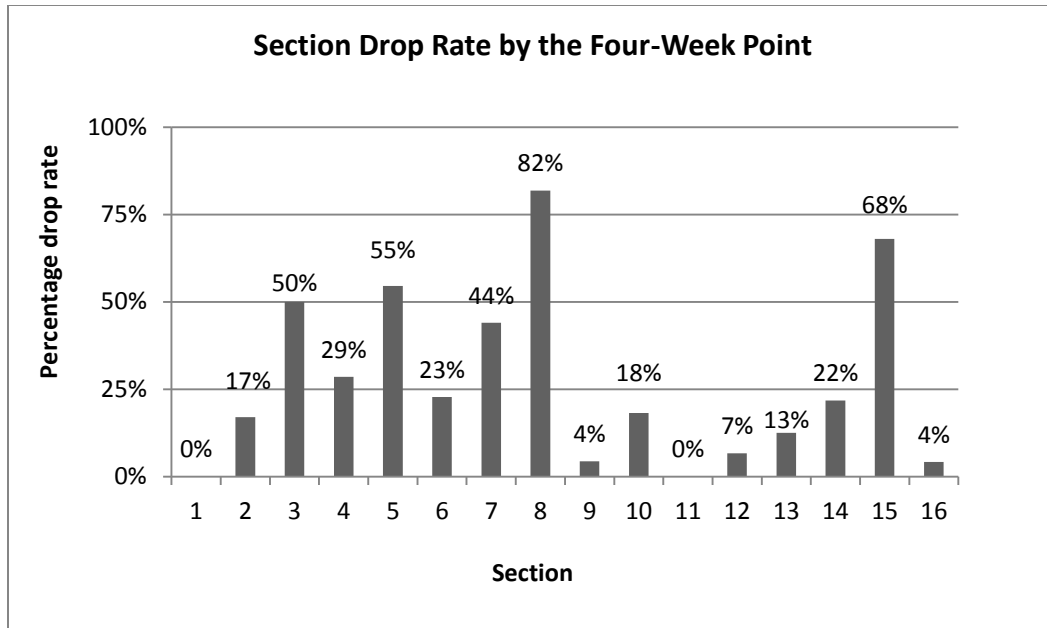
Figure 28: Section drop rate by the four-week point

Overall four-week drop rate by teacher. Figure 29 shows that the drop rates for

Teachers One and Four fell within the dropout range for online classes reported in the

literature (Roblyer, 2006). Teacher Two is notable because of her high drop rate (50%), and

Teacher Three had a very low drop rate (8%).
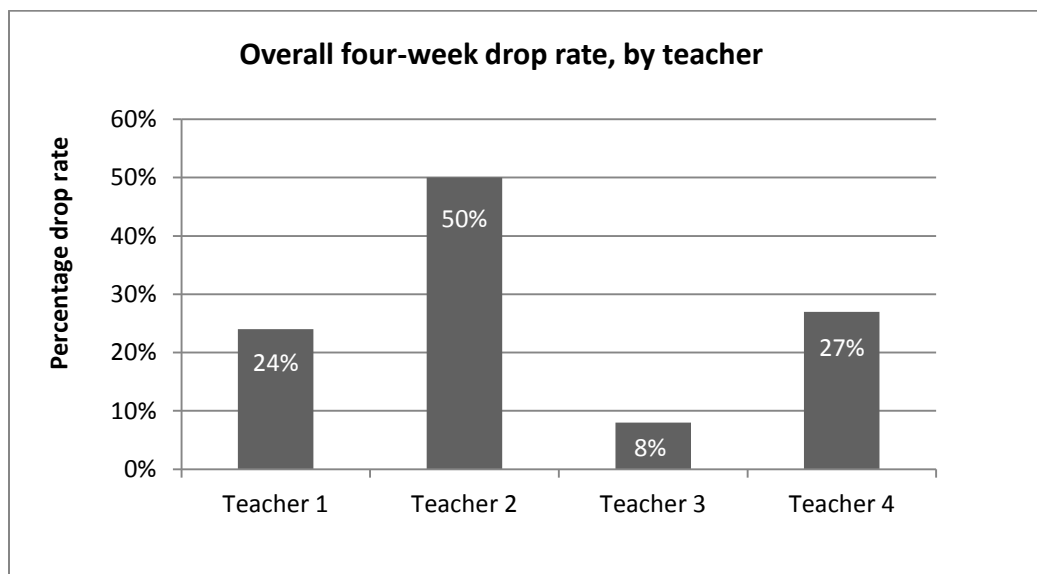
Figure 29: Overall four-week drop rate, by teacher

Comparing students who completed the course with those who dropped. It is important to compare the groups of students who completed the course with those who dropped because social presence patterns may suggest possible differences in these two types of students. Figure 30 provides a detailed breakdown of the SPD for each social presence indicator for students who dropped the course and whether such students tended to have a higher SPD (H) or lower SPD (L) than their section peers. White space in the table indicates no significant difference between students who completed the course and students who dropped the course. Sections 1, 11, and 12 had no drops[3]. The codes that describe *reference to resources* and *chastisement* are not included because of their infrequent occurrence.

Figure 30

SPD Characteristics of Students who Dropped the Course

Social Presence Code	Section															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Greetings		H						H								
Group References		H		H	H			H								
Social Sharing		H		H												
Vocatives				H				H		H						
Emotion														H		
Humor/irony																
Sarcasm				H											H	
Paralanguage						H										
Self-disclosure		H						H					L			L
Acknowledgement						L										
Ask/request/inquiry								L					L			L
Complaint			H	H				H								
Compliment/agreement																
Disagreement						H		H								H

H = At least 1 s.d. higher SPD than section peers who completed the course

L = At least 1 s.d. lower SPD than section peers who completed the course

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[3] Sections 9 and 12 had only one student who dropped, and are excluded from the analysis.

The criterion used to determine H was one standard deviation (s.d.) above the mean, and to determine L was one standard deviation (s.d.) below the mean. Approximately 68% of a normal data distribution falls between these two points, and this was useful in exploring potential differences between students who dropped out of the course and students who persisted. A higher cutoff point would have limited findings to small numbers of outliers, about which very little could usefully be said.

Dropout characteristics of students associated with different teachers. Different patterns of dropout characteristics of students appear to be associated with the high social presence teachers compared to the low social presence teachers.

Sections taught by Teachers One and Two (high social presence). The students who dropped in sections 2 through 8 often showed higher levels of cohesive social presence behaviors than their peers who persisted. These types of behaviors are thought to contribute to the sense of community in the group. These students could in very general terms be described as high social presence and engaged in the discussion, but dissatisfied (high levels of complaint, disagreement, or sarcasm) and self-absorbed (high self-disclosure, low acknowledgement and ask/request/inquiry). In some sections students who dropped the course were different from their peers on multiple social presence indicators. Teacher One's sections (1-4) had the lowest SPD scores in the cohort. Therefore the students that dropped in these sections were possibly showing social presence behaviors that were more "typical," e.g., more similar to the other students in the cohort.

Sections taught by Teachers Three and Four (low social presence). The students who dropped out in sections 10, and 13 through 16 had different characteristics from the students who dropped out in sections 2-8. They showed no difference in cohesive behaviors

from their peers who persisted, except for high vocatives in section 10 (Teacher Three).

Teacher Four's dropouts were lower than peers who persisted on both self-disclosure and

ask/request/inquiry, which captures attempts to initiate or continue a discussion thread, and

higher on disagreement and sarcasm, suggesting that these students were disengaged and

dissatisfied. Generally the students that dropped in these sections differed from their peers

who persisted in the course on only one or two social presence indicators.

Summary of findings for third research question. Certain differences in social

presence characteristics became apparent when comparing students who dropped the course

with those who completed. It appeared that two types of student dropped in the present

study: those who had a high SPD relative to their section peers, but were perhaps dissatisfied

or self-absorbed, and those who displayed low SPD relative to section peers, possibly due to

a general lack of engagement in the course. It is not possible to offer evidence that confirms

the accuracy of these characterizations as no data were collected from the students

themselves about their state of mind or attitude during the online course. Overall, in half of

the sections that had students who dropped out, the dropouts were higher on negative social

presence indicators (sarcasm, complaint, disagreement) than their peers who persisted in the

course.

Treatment versus control sections. It is important to acknowledge that the

Supporting Distance Learning study was a randomized, controlled study and thus had two

different groupings. Each small rural school was assigned to a section that comprised either

all-treatment or all-control schools. Odd-numbered sections were in the control group and

even-numbered sections were in the treatment group. The online teachers were blind to

assignment of schools, were not informed of the purpose of the study, and the intervention

did not directly target students, or change the course content or curriculum in any way. Each teacher taught two control section and two intervention sections.

The intervention provided enhanced training for on-site facilitators to support students and create a positive climate in the local classroom. From prior research in the Supporting Distance Learning study it was found that effective and supportive on-site facilitators existed within both the intervention and control groups: some facilitators were naturally learner centered, engaged in their role and supported their students regardless of assignment to group. Also regardless of assignment to group, some facilitators were ineffective because they were either absent, neglectful of their students, or over-concerned for their students' welfare, feeling that the course was too rigorous or demanding (de la Varre, Keane, Irvin, & Hannum, 2008; de la Varre, Keane, & Irvin, 2011). No quantitative intervention effects were found in cohort two pertaining to course grades, AP exam scores, or student dropout.

The present study concentrates only on the online discussion portion of the online course. On-site facilitators did not participate in online discussion. It is however possible that the behaviors of the on-site facilitators *did* have some effect on students' social presence behaviors online, just as it is possible that other contextual factors in the local learning environment affected students' online interactions. While there do not appear to be any patterns specific to intervention or control sections in the illustrative figures in this chapter, an exception to this is the SPD for the codes *paralanguage* and *self-disclosure* (Figures 16 and 17). For paralanguage, it appears that the SPD was generally higher in the control group sections for both students and teachers. To a lesser extent a similar pattern can be seen with student self-disclosure, particularly for those sections taught by Teachers Two and Three.

CHAPTER 5

DISCUSSION

This chapter focuses on the major findings associated with each of the three research questions in this study. These explored social presence behaviors in students and teachers, and the association between social presence behaviors and student dropout. The findings come primarily from a content analysis of transcripts from online discussion by students and their teachers, with additional supporting data from year-end interviews with the teachers and program record data. The chapter also revisits social constructivism and social presence as the respective conceptual and methodological frameworks supporting the aims of this study. Finally, the chapter discusses the implications of these findings for future research and online teaching practice, the limitations of the study, and presents a brief conclusion.

The most prominent patterns discovered through the content analysis were that students' social presence behaviors were primarily of the affective and interactive types, while teachers' social presence behaviors were mainly of the cohesive type, with particularly high levels of reference to resources. Regarding student dropout, in about half the sections the students who dropped out had higher levels of negative social presence behaviors, namely sarcasm, complaint, and disagreement.

Teacher Social Presence Patterns

In contrast to findings from previous studies that indicated that teachers contributed 10-15% of the messages in a discussion forum (McLoughlin & Mynard, 2009), teachers in this study typically only contributed 5% or fewer of the messages in their sections. The

exception was Teacher Three, whose messages constituted 10-18% of the messages in her sections. In keeping with a social-constructivist approach, the teachers generally took a "guide on the side" role (Mazzolini & Maddison, 2003), allowing their students to discuss topics with relatively little teacher input, except when they considered students were going off-topic or posting inappropriately. Teachers were thus attending to what Wise et al. (2004) cautioned about, i.e. that students in group discussion were not merely "reinforcing and elaborating their current misconceptions."

Mazzolini and Maddison (2007) note that a common assumption by researchers (Berge, 1995; Kearsley, 2000; Paloff and Pratt, 1999; Salmon, 2000; Salmon & Giles, 1997) is that a healthy or robust discussion forum contains a greater number of student messages, and online teachers should play an "active, visible" part in online discussion in order to increase student participation. Mazzolini and Maddison (2007) stated that at least in their study this did not happen, although they believe that a high teacher contribution and fewer student posts may mean that discussion is more efficient and students spend less time "pursuing false trails and conducting inconclusive debates" (p. 211). However, Mazzolini & Maddison (2003) also found that teachers who contributed minimally were less likely to be perceived as experts by students. Other researchers (Garrison & Anderson, 2003; Garrison & Cleveland-Innes, 2005) suggest that the online teacher adopt a leadership role in discussion in order to trigger interactions of sufficient quality for learning, somewhere between the "guide on the side" and the "sage on the stage" roles suggested by Mazzolini and Maddison (2003).

One study found that when the guidance of teachers was minimal or lacking, students' posts consisted mainly of "serial monologues" (Pawan, Paulus, Yalcin, & Chang,

2003). In contrast, the present findings show that students displayed high levels of acknowledgement of other's posts and initiation or continuation of discussion threads by asking questions, suggesting that they were engaging in interactive discussion rather than monologue, even when teachers' contributions to the discussion were minimal. However, the present study did not include analysis of content beyond the social presence indicators contained in messages, and Borup, Graham, and Davis (2012) caution that "unchecked" discussion boards contain mostly social interactions with little focus on academic content.

Only two of the teachers in this study consistently contributed posts to discussion boards other than the office. The other two teachers were only monitoring and answering direct questions.   While all the teachers indicated in their post-course interviews that they saw their role as a moderator of discussion, the two that posted mainly in the office might be considered to be playing more of a "ghost in the wings" role (Mazzolini & Maddison, 2003). Mazzolini and Maddison (2007) found that teachers' perceptions of their own discussion board behaviors did not always match up to the coded observational data and it is possible that in the present study two teachers were not fully aware of their own online behavior patterns. This would seem to be a missed opportunity for teachers to take an active role in shaping or guiding discussion, as well as to foster or be an active part of the community that developed within the course sections. There is no other virtual location in the online course where group discussion took place or students could "talk" to each other. The alternative available communication formats included the bulletin board (teacher to students), or private messages between teachers and individual students.

Activity in Online Discussion

As one teacher said, "No one was supposed to be given grades just because they

popped up on the discussion board; they had to address the topic." Although Tu and McIsaac (2002) found that the quality of online interactions, rather than the frequency of participation, determined the level of social presence (sense of community), frequency of participation still imparts some information about the user and their engagement in the course. Social presence could be said to increase with actual number of posts because of increased recognition and familiarity with the person who is posting, just as a students in a traditional classroom become more familiar with a peer who regularly speaks up in class. When a student posts a message, that student's name appears on the discussion board. Students and teachers therefore become more aware of the presence of students who post more than their peers, regardless of the content and the social presence indicators that are present in those messages. At least one teacher noted that students who posted more messages showed a greater level of engagement in the course overall. The SPDs were similar for the highly active students in the sections taught by Teacher Three (a low social presence teacher with a low drop rate) and the minimally active students in sections taught by Teacher Two (a high social presence teacher with a high drop rate).

It can be difficult to determine the direction of influences on social presence behaviors in online discussion. Teacher behaviors are more likely to have influenced student behaviors where teachers made a substantial contribution to the tone or direction of the discussion, through numbers of messages posted. A teacher who posts 2% of the messages in a discussion forum may have a similar pattern of social presence indicators as a teacher who posts 20% of the messages in a forum, but students will perceive those teachers differently and be more aware of the more active teacher simply because these teachers have

104

more "presence" on the forum. An active teacher will therefore be increasing social presence by being more "visible" than an inactive teacher.

It is important to recognize that counting observable social presence behaviors at the individual level, as this study does, will not always capture the "gestalt" of social presence in a real-world environment. The whole is almost certain to be greater than the sum of the parts. The frequencies of occurrence of social presence indicators in text do not provide a complete picture of social presence at the group level, or the perceptions of participants in the online discussion forums. This study had a complex structural hierarchy in that individual students were nested in small rural schools, and the small rural schools were nested in virtual course sections. So students interacted with and were influenced by their peers in the local face-to-face classroom as well as in the online classroom. To obtain a more holistic view it would be also necessary to incorporate qualitative measures of students' and teachers' perceptions of the sense of community online, as well as perceived satisfaction with the course, the course environment, the other participants, and learning outcomes. The association of observed social presence behaviors with perceived sense of community could then be evaluated. The distinction between definitions of social presence and how they are measured is discussed in Oztok and Brett (2012), and the authors note that regardless of definition, social presence is useful in explaining differences in participation and learning among students in the same online environment.

Social Presence and Student Dropout

In the present study, most students who dropped the course did so within the first four weeks. As with any class, online or face-to-face, some students dropped out due to scheduling conflicts, over-scheduled timetables, or personal reasons that had little or nothing

105

to do with the actual class content or environment. However, if students dropped out for other reasons, it can be hypothesized that they dropped out because the degree of support they needed to be successful in this online course was not forthcoming. This may have been a perceived lack of support from the teacher, problems with the rigor or pace of the class, frustration with technology or the online format, or a lack of motivation, and these issues are discussed in another paper derived from the Supporting Distance Learning study (de la Varre, Irvin, & Jordan, 2012, unpublished). Exploring the social presence behaviors exhibited by those students who dropped out may help shed some light on their degree of engagement with the course content, their online peers, their teachers, and possibly the technology that delivered the course (Beldarrain, 2008; Hillman, Willis, & Gunawardena, 1994; Moore, 1993; Sutton, 2005).

A student's individual social presence behaviors are situated within the context of the overall class social presence environment. The experience of social presence as a class- or section-level phenomenon may be just as important as individual students' social presence behaviors. The findings in this study seem to suggest that two types of students dropped out of the online course. The first type consisted of those students characterized by a high level of social presence in their online interactions, and exemplified by students who dropped out in sections 2 through 8. Much prior research (Boston, Diaz, Gibson, Ice, Richardson, & Swan, 2009; Oztok & Brett, 2012, Tu & McIsaac, 2002) suggests that students with higher social presence are more likely to persist in a course because they perceive themselves as being part of a group or community. However, the findings from the present study suggest that high social presence students may have dropped the course because their high social presence interaction style was mismatched with the lower levels of social presence in their

106

course section. Cereijo et al. (2001) found that it was the extroverted online students who tended to express "extreme frustration with isolation and technical problems" (p. 37). It is interesting to note that these high social presence students also exhibited higher rates of negative social presence behaviors, such as sarcasm, complaint and disagreement, than their peers who persisted. The second type of student who dropped out of the course tended to exhibit lower levels of social presence relative to section peers, one possible indication of a general lack of engagement in the course. These students are exemplified by the students in sections 13 to 16, taught by Teacher Four.

Brown (2001) noted that not all individuals in an online community have similar perceptions of connectedness or belonging. A student with high individual SPD relative to peers in a particular class may perceive that the class has lower social presence and therefore feels less satisfaction with the interactions within that class. A student with an identical SPD score but in a different class may fall in the middle and feel comfortable with the class social presence levels, so the absolute SPD is not as important as SPD relative to classmates. Similarly, a student with low SPD relative to peers may feel that the class is overly sociable, and that purely social interactions are a waste of time, as several researchers have reported to be the case for low social presence students (Rourke & Anderson, 2002; Rourke, et al., 1999). It is interesting to consider whether some students have low levels of social presence behaviors because they feel they do not belong to the group, or whether such students fail to connect with the group *because* they exhibit fewer social presence behaviors.

Some of the students that dropped out of the course had higher SPD for the disagreement indicator than their class peers. The disagreement code refers to polite (non-hostile) disagreement or critique. Although any such interactions would most likely be

107

encouraged in a course, and possibly indicative of higher-order thinking or increased

engagement with the course content, Brown and Levinson (1987) note that disagreements in

the context of group discussion violate the expected norms for polite interaction. Pomerantz

(1984) states that disagreements in discussion or conversation are perceived as unpleasant

and those who engage in them feel they risk "threat, insult, or offense" (p. 77).

As disagreement in academic settings is potentially a way to broaden horizons and be

exposed to various and different viewpoints, these social norms may prevent students from

benefiting from discussions that might result from disagreement. Perhaps students in high

school, particularly when taking an online course with strangers, are uncomfortable with

conflict, disagreement or expressing a difference in opinion, even when desirable. Teachers

should be cognizant of this dynamic, as they help to set the climate for learning, where

teaching presence and social presence overlap (Anderson, et al., 2001; de la Varre, Keane, &

Irvin, 2011). Indeed, identifying areas of agreement and disagreement is part of the teaching

presence component of the COI model (Garrison, Anderson, & Archer, 2000).

This is another argument for the importance of creating community in online courses

and a good reason for teachers to moderate discussion rather than just monitor. Several

researchers remind us that even in social-constructivist settings the purpose of the teacher, as

the expert, is to manage the direction of the discourse, keep students on topic, and proactively

support students as they interact and progress to more sophisticated forms of higher-order

thinking (Anderson, Rourke, Garrison, & Archer, 2001; Romiszowski, 1995; Stacey, 2002).

This helps create a climate in which students can trust the forum and thus feel safe expressing

differing opinions and revealing their thoughts (Clifton, 1999; McInnerney & Roberts, 2004;

Wise et al., 2004). Self-disclosure is one important for establishing trust and in the present

study almost all the students engaged in self-disclosure. Swan and Shih (2005) suggest

building topics into the curriculum to support social presence development and using grading

rubrics that encourage students to share personal experiences specifically for this purpose.

Revisiting the Conceptual Framework

Social presence in ODE has been a frequent topic of study as researchers seek to

understand the role of interaction in facilitating learning in online environments.

Interpersonal and intragroup interactions may certainly differ in many respects when students

are geographically separated and communicating asynchronously. Social-constructivism as

originally conceived of by Vygotsky was based on the assumption of face-to-face

interactions in real (synchronous) time. Vygotsky's life and work predated online learning

by half a century, but as multiple researchers have proven, students interact online and

learning *does* occur, even through asynchronous interactions (Anderson, 2003; Garrison, &

Kanuka, 2004; Hudson, 2002; Jung, Choi, Lim, & Leem, 2002; McDonald, 2007; Stacey,

2002). For Vygotsky interpersonal interactions included accompanying gestures and the

"host of assumptions" they transmit about the world (McNeill, McCullough, & Tyrone, 1994,

p. 147). Social presence cues allow individuals to move from the interpersonal to the

intrapersonal in the same process that Vygotsky described, i.e., learning through social

interactions ultimately leads to the internalization of knowledge. The social interactions in

online environments rely to some extent on social presence cues, and coding social presence

behaviors is an attempt to identify and categorize exactly what textual elements allow readers

to participate in what they perceive to be an interpersonal interaction: a conversation with a

real person. Social presence research also attends to paralinguistic cues associated with

online discussion. Paralinguistic embellishment of text exemplifies Vygotsky's "gestures

that have been fixed" through written signs (Vygotsky, 1978, p. 107) which allows the author

to convey multiple speech acts simultaneously, albeit through the written rather than spoken

word (Kendon, 2000).

Many students today, as "digital natives" (Prensky, 2001), are no doubt very familiar

with socializing online but are perhaps less used to communicating online in the more formal

academic style required for schoolwork. Asynchronous discussion, rather than being just an

arena for chat, provides the opportunity for students to take a more reflective approach to

discussion, and to compose and edit their messages before posting them. Asynchronous,

text-based courses are easy to design and implement, and allow students and teachers greater

flexibility than synchronous courses. However, as a tool for mediating interactions, the

computer's potential is often barely tapped during ODE. The online course in the Supporting

Distance Learning study was first implemented in 2007 and interaction built into the course

primarily consisted of text-based asynchronous threaded discussion. Students had the option

of contacting the online teachers using Skype™ but only a handful of students took

advantage of this mode of communication. Some schools did not allow the Skype™

software client to be installed due to security concerns. Online courses potentially have

many avenues available for online interaction, and it is less likely now than when this study

was implemented that interactions within a virtual environment would be limited to text,

although discussion boards are still likely to be of the asynchronous type. There is a wealth

of interactive and social media tools that could potentially enrich ODE and allow

connectivity between students in the virtual environment in multiple ways, but these tools

may be more suited to synchronous communication. Nevertheless, as mentioned in the

introduction to this paper, advances in technology often happen too quickly for ODE research

to furnish evidence that supports their use. Asynchronous discussion at least has decades of research behind it to support its efficacy as a tool for interaction and communication.

Vygotsky believed that the types of interaction available to the learner, and the tools and symbols that mediate those interactions, depend on the culture and context in which those learners are embedded (Davydov & Kerr, 1995). Tools influence but also constrain their users' behaviors, so users develop new ways to circumvent those constraints. In this study, students were clearly interacting effectively through text-based online discussion, but often posted links to popular social networking sites such as Myspace.com and Facebook.com where they could move beyond the constraints of the text-based medium, and beyond the boundaries of the course proper. This pattern recalls Brown's (2001) findings that in the later stages of community building a sense of camaraderie has developed over time and interactions outside the course environment contribute to this.

Implications for Practice

Social presence in general is not something that needs to be cultivated. It is almost impossible to write a message online that does not convey some kind of presence - such a message would have to be a stand-alone post e.g. not in response to anyone else, would not convey any kind of emotion, would not use paralanguage, would not ask questions or acknowledge personal difficulty or confusion of any sort, and nor would such a message convey information about personal environment (external or internal). Even stating an opinion indicates that there is an assumption that others are paying attention. However, in the present study in three of the sections the students who dropped out exhibited lower levels of ask/request/inquiry than their peers. This indicates that they were less likely than their peers to initiate or attempt to continue a conversation thread by asking questions or seeking

111

input or feedback from others. It seems important therefore that online teachers encourage students to interact in these ways. Indeed, a common practice in online courses is to incorporate mandatory graded exercises that require students both to initiate and continue discussion threads.

Attention to social presence offers a number of potential insights into learning, engagement, community, and attrition in ODE at high school levels. It is still not clear, especially at the K-12 level, what social presence behaviors are desirable and how often they should occur. In this study, the students that dropped out often displayed significantly higher levels of cohesive and affective behaviors than their peers, favorable indicators for the formation of an online community. However, these students also showed higher levels of sarcasm, complaint and disagreement than their peers. Attending to low activity levels and low social presence may be useful in identifying whether individual students are struggling with a lack of engagement. However, high social presence and activity do not necessarily indicate that students are actually engaged in the course. They may have a high social presence but are using online discussion mainly to socialize, or indulge in negative behaviors such as complaint, rather than engage in academic pursuits.

In the process of moderating online discussion, teachers could identify those students who are less active and encourage them to contribute more, a strategy that is certainly used in practice (Borup et al., 2012). However, this is not as simple as it sounds, given the lack of clarity in the literature, and the findings in this study, regarding optimal teacher participation and how to encourage student contribution without reducing interaction or participation even further. One teacher in this study observed that if she posted too often it ended the discussion, while another commented that she hesitated to "jump in" for fear of stifling the

conversation. Mazzolini and Maddison (2007) found that when instructors posted more messages and played a more prominent role in discussion students posted fewer messages and had shorter message threads. Paloff and Pratt (2001) also had concerns about active teachers, cautioning that a highly active teacher may have the undesired effect of reducing student interaction and lead to students becoming too dependent on the teacher's input rather than thinking for themselves. Several researchers working with K-12 online populations suggest that learner-learner interactions play a more important role in this age group than in higher education populations (Beldarrain, 2008; Borup et al., 2012; Moore, 1989). Borup, Graham, and Davis (2012) found that student-student interaction in a virtual high school class was significantly correlated with grades. It would make sense to build into the curriculum exercises where each student was required to start discussion threads, continue discussion threads and respond to peers. The ice-breaker activity in the Supporting Distance Learning study did exactly that, but some students just satisfied the minimum requirements while others were much more active. These variations in participation in online activities may simply be due to differences in individual students' abilities to engage and interact with course content, as noted by Borup et al. (2012).

Teachers need to make clear from the outset of the course their expectations and preferences regarding communication in online discussion, and what they believe the purpose of online discussion to be. Although all teachers stated that they read all students' posts and considered themselves moderators of discussion, in reality some of the teachers monitored rather than moderated. Thus not all the teachers took advantage of the opportunity to actually teach in the DBs, which were the only place within the course to interact with the

students as a group. By not participating, teachers also missed the chance to shape or guide the discussion, and to contribute to the sense of community in the group.

The social presence behaviors that occurred frequently on the DBs in the present study, particularly self-disclosure, inviting further discussion (ask/request/inquiry), and acknowledgement of others' posts, were all indications that students were forming an online community, getting to know each other, and were becoming comfortable in their interactions (Rourke, et al., 2000). Formation of community in online courses should be a priority at the high school level. Rovai (2001) believes that an awareness of this dynamic, and the balance required to maintain social presence, is what makes an online teacher successful. A comment by Teacher One suggests that she recognized this: "Please make a post and explain what the puzzling, stumping, and confusing issue might be. Hopefully, there will be at least one of your peers that thought that question was their personal favorite and will respond with helpful words of advice. I may chime in from time to time for assistance."

Teacher Four contributed very little to the online discussion in her sections, yet her students had the highest course grades in the cohort. Perhaps she felt little need to interact because her students were doing well with only minimal input from her. Although we do not have measures of students' perceptions of learning and engagement, the high course grades would suggest that students did learn in this course. It is not possible to state how much learning occurred via online discussion versus other channels within the course, but the discussion board grades were worth 20% of the final course grade, and the discussion boards were the only place in which students could interact with their peers. Teacher Three had the lowest SPD of all the teachers but was the second most active teacher in numbers of posts. Her sections had low drop rates and relatively high grades, again suggesting that her students

114

were engaged in the course and were learning. This finding is akin to the findings of Wise et al. (2004) that students with low social presence instructors reported higher perceived learning, and higher levels of engagement in the course than students with a high social presence instructor. Perhaps in the present study this teacher's presence through activity was important here rather than high levels of social presence conveyed through affective or cohesive behaviors. Wise et al. (2004) stated that their findings, in the "wrong direction," were "unexpected and unexplained."

Teacher Two was the most active teacher and had a high level of social presence, but she also had a very high drop rate. Perhaps she wanted to actively support the students who remained while so many were dropping out at the beginning of the course, although it seems likely that the combination of a high number of messages with high rates of teacher chastisement and relatively high rates of teacher sarcasm may have been a key factor in the drop rate in these sections. Her students posted a low number of messages relative to the rest of the cohort and as Mazzolini and Madison (2007) suggested, the activity level might have been an attempt to "fill the silences" (p. 195). Wise et al. (2004) concluded that social presence affected the nature of the interaction between students and teacher, as well as students' perceptions of the teacher, but did not directly affect learning. Akyol and Garrison (2008) reached a similar conclusion. The present study suggests that certain teacher social presence behaviors can affect not only activity but possibly even dropout rates.

Implications for Future Research

The COI continues to be widely used, and discussed, as a framework for ODE research, although many researchers are calling for studies that look at the interaction between the three presences in the framework: social, cognitive and teaching. The present

study examines student social presence and teacher social presence and is not specifically concerned with the other presences, except to acknowledge that teacher social presence overlaps teaching presence. It would be instructive to look for evidence of learning within the discussion board transcripts, and to examine the larger construct of teaching presence (not just teacher social presence). It would also be instructive to use this same data set to look at changes in social presence over the course of the whole academic year in both students and teachers. The findings from this study make an important contribution to the literature concerned with optimal teacher participation in online discussion. By drilling down to the sub-elements of social presence, e.g. specific behaviors, these findings perhaps help to clarify results in other studies that are "unexpected and unexplained" (Wise, et al., 2004) where having teachers with high social presence or who actively participated in online discussion did *not* result in increased student participation, sense of community, or learning. Social presence is not just one entity, e.g. a set of online behaviors or a sense of community, but encompasses and is created through a range of behaviors, each individual element of which can have effects on the dynamics of online groups. Future research should also be concerned with the mutual effects of social presence at the different levels of an educational environment, e.g., the individual level and classroom level. Future research could also look at effects of teacher social presence at the levels of individual student and classroom.

Strengths of the Study

Strengths of this study include the size of the data set that was coded, the richness of the data, and the rural K-12 (high school) population, and the inclusion of teacher social presence data. Much ODE research has been conducted in post-secondary communities, and very little in rural communities, although almost 10 million U.S. children are educated in

116

rural settings. In addition to the data that was available through automatic capture by the content management system, data from post-course interviews with the online teachers helped to triangulate the findings from the discussion board transcripts. The results in this study contribute to the literature on optimal teacher participation in online discussion, social presence in rural and K-12 populations, and student dropout in ODE.

Another strength of this study was the calculation of inter-coder reliability and coder stability over time, beyond percentage agreement. Many content analysis studies contain inadequate information about inter-coder reliability, thus limiting the conclusions that can be drawn from any findings.

Limitations of the Study

This was a secondary analysis of data collected in the Supporting Distance Learning study, whose primary purpose was an in-depth examination of the role of the on-site facilitator in small rural schools and whose intervention expanded that role. The online communication interactions between students and their online teacher that were captured automatically by Blackboard were not included in the data that were examined in the various analyses in the larger Supporting Distance Learning study. Online discussion was merely one part of the online course and students were not surveyed or interviewed on their perceptions of discussion, the process and purpose of discussion, or their opinions and perceptions of the online teacher in terms of discussion participation, grading, teaching, or social presence behaviors. It would have been very informative for this study to have a measure of how students perceived social presence in the course in order to complement the study data collected about individual social presence behaviors. Where social presence is *perceived* to be higher, researchers have reported a number of positive learning outcomes

(Hostetter, & Busch, 2006; Picciano, 2002; Schutte, 1997) although it is not always clear which definition of social presence is being referred to: online behaviors, a synonym for sense of community, or the actual measurable social presence behaviors of individuals (Hawkins, Barbour, & Graham, 2011).

Another limitation of the study was missing data. Prior to the course teachers were not given guidelines for deleting, removing, or archiving posts from the discussion boards. This was because the focus of the original study was on the role of the on-site facilitators, and teachers were given free rein to run the online course exactly as they would in non-research conditions. This included the occasional closing of the social boards by some teachers at times when they felt students were being distracted by them. During the year-end debriefing, some teachers revealed that they had sometimes purposefully removed posts that were rude or offensive. As noted in the Methods section, the data from only four of the five online teachers in the studies were used because in the class taught by the fifth teacher one of the facilitators had deleted all discussion board data from the first month of the course. One instructor reported removing posts by a particular student that were "all just whining and complaining about aspects of her life." Ideally, all DB data, including posts that were removed, would have been preserved for later analysis.

The use of the Blackboard content management system (CMS) meant that when students dropped the course they no longer appeared in the Blackboard course statistics modules. This meant that information about the number of times students logged into the CMS, how much time they spent on each module, how many pages they viewed and the times of the day they posted was not available. If available this would have enriched the data by making it possible to explore whether social presence was associated with particular

patterns of viewing pages, or spending time within specific course modules, and whether activity in terms of numbers of posts was associated with activity in terms of discussion threads viewed or read. However, the discussion board posts, which were of course the focus of this study, were entirely preserved for analysis within each discussion forum when a student dropped the course.

It appears that the code *compliment/agreement* may be poorly defined because it is applied to two separate social presence behaviors, namely offering compliments or praise, and agreement. When the transcripts of teachers' behaviors elicited this code it was typically due to teachers complimenting or praising students rather than agreeing with them, whereas students tended to agree with their peers rather than compliment them. Maybe when teachers praise or compliment a student post, other students are more likely to state agreement with that post. For future analyses of social presence using this model, the code should be separated into two different codes, one for compliment/praise and one for agreement.

Finally, this study was conducted in small, rural high schools in the U.S. and may not be generalizable to other settings. It did not evaluate the effects of gender. Online communication is not gender neutral as males and females have different online communication and interaction styles (Herring, 1996). Race/ethnicity was less of an issue because the student population in the small rural schools was not diverse. The data are limited to a single course, AP English Literature and Composition, and recent research shows that there may be subject matter effects in online learning (Arbaugh, Bangert, & Cleveland-Innes, 2010).

Conclusion

Although discussion boards in high school courses are necessarily time limited,

focused on a particular and narrow topic, and composed of one expert and many novices (Annand, 2011), students still have different opinions and experiences that can contribute to and further the overall knowledge of the group. Perhaps one purpose of providing tools such as online discussion forums that build social presence in the ODE courses taken by rural high schools should be to encourage the development of a sense of community that approximates the sense of community typically felt in small rural schools. Social presence should not be looked at as merely support for learning, but as a factor that creates community and cohesiveness, makes the class enjoyable and motivates students to interact more. As Xin (2012) says "social presence goes beyond a mere aspect or component of online discussion; it is the backdrop of everything that goes on. All online utterances are inherently social..." However, it is important to attend to the social presence behaviors of individual students within the context of the whole class. Many of the students who dropped out exhibited significantly higher levels of cohesive and affective social presence behaviors than their peers who completed the course. Although these students appear to have behaved in ways favorable to the formation of an online community, perhaps at the classroom level the environment (their peers) did not reciprocate adequately. These students also displayed higher levels of complaint or disagreement perhaps reflecting that their needs for high social presence at the classroom level were unmet and contributed to dropout.

Hawkins et al. (2011) found that immediacy, or the social behaviors that allow a sense of psychological closeness to develop between students and teachers, was just as important to teachers as it was to students, and that teacher isolation was also an issue in ODE. Hawkins et al. (2011) reported that teachers were concerned about maintaining student-teacher boundaries and reluctant to disclose personal information but then

120

"lamented" the fact that they did not have personal relationships with their students. However, these teachers also felt that the lack of social interaction reduced their role to merely grading students' work.

One of the teachers in this study exhibited all the behaviors that are supposed to foster a sense of community in online discussion, e.g. humor, self-disclosure, informal language and attempts to get to know her students (Nippard & Murphy, 2007). However, the social presence in her students was low compared to other teachers' sections, and her course grades were low. In the present study, as already mentioned, we do not have access to data about students' perceptions of this ODE course and nor whether sense of community is associated with academic outcomes in this population. A combination of content analysis—coding for social presence indicators—as well as interview or survey data to capture students' perceptions, would give a more complete picture of social presence in this, or any, virtual course.

While reading and analyzing the transcripts it was apparent—even without specifically coding for cognitive presence indicators—that students were building collective knowledge as well as socializing on the online discussion boards. They gave their opinions about literature, offered advice to peers, commiserated with one another about how hard the practice test was, shared strategies for test taking, and discussed their emotional reactions to the ending of the short story "A Rose for Emily" (Faulkner, 1930). Much of the interaction on the social boards or ice-breaker activity consisted of finding out commonalities as rural students and members of rural communities, despite considerable differences in location and local culture.

There is no indication in this study that participation in the social board increased interactivity, number of messages posted, or participation on other discussion boards. However, there is some evidence that students themselves were aware of the different requirements of each type of board, because individual student SPD scores were higher on the social DB than on other types of DB. Whether a separate social board is worthwhile may be a decision for individual teachers. Students appeared to get to know each other through mandated, graded ice-breaker activities but academic content was also sometimes found on the social boards. Maybe more guidelines to students about communicating online would help - not just using emoticons, but some information about social presence such as personal disclosure, use of personal names, and group references. In other words, it may be beneficial to explain to students in advance what cohesive, affective and interactive behaviors look like, as well as the more negative social presence behaviors like sarcasm, complaint and disagreement. If disagreement and critique are felt to be desirable characteristics for student interaction in the online course then advise students that they may feel uncomfortable with these behaviors at first.

For teachers, attending to social presence (both their own and their students') and creating relationships with individual students may be hindered by large class sizes. Also, the requirements in advanced courses like AP where the curriculum has to be approved by the College Board mean that teachers have to set a fast and rigorous pace in order to cover all the material, leaving little time for online community building or socializing. Online teachers must strike a balance that encourages a sense of community to form yet leaves students enough space to interact without feeling over-scrutinized. They must also be aware of students who have low social presence and are minimally active, and perhaps contact them

privately to encourage greater participation. They must also be aware of negative social

presence, as a possible indication that students are dissatisfied and more likely to drop out.

The more we can learn about the specific social presence behaviors that allow teachers to

develop that awareness, the more teachers can tailor and adapt their online teaching methods

and styles in ways that result in positive outcomes for students. Wise et al. (2004) suggest

that perhaps there is a threshold for social presence where a minimum is needed but more is

not necessarily better. The social presence patterns observed when comparing teachers in

this study suggest that while teachers' influences are considerable, less may be more.

APPENDIX A

How I Will Assess Your Discussion Board Work

Aside from the basic tests and quizzes, I will assess your participation in the discussion boards. You will be evaluated on your participation, including your posting of numerous thoughtful comments and your successful completion of assignments. Sometimes I will ask you to complete a portion of your homework or classwork as part of a discussion. Other times I might ask a general opinion question.

Regardless of the particular post you are making, below are some guidelines on how to post and what I will be looking for when you are making your post.

Rubric for Participation in Graded Discussion Boards

How do I assess discussion board participation? A simple answer is that I look for frequent and appropriate contributions to class discussions from all participants.

Just what do "appropriate" contributions look like?

- My assessment of your postings is based upon your level of contribution as a whole, rather than having specific points assigned for content, style, correctness of expression, etc.

- I encourage you to consider how your writing style appears to others. If you know that spelling is not your strong suit, you might try writing and spell checking in a word processing document, then pasting those comments into your posting in the DB.

- Your discussion postings should be thorough and thoughtful. Just posting an "I agree [or disagree] with your comment" or "I think the same" to someone else's thoughts is not considered adequate, and *will not be considered as participation* when it comes to determining your grade.

  Here are some of the characteristics that I consider to be part of excellent discussion contributions, and these are the things I will look for when I assess your participation:

  - Original insights
  - Insights or responses that build on the ideas of other participants
  - Responses that are appropriate to a particular purpose and audience
  - Content that demonstrates you have read and understood the particular reading
  - Skill and competency in the use of language
  - Clearly expressed ideas
  - Content that elicits reflection and responses from other participants
  - Responses to those who comment on your contributions
  - Responses that integrate multiple views

- Responses that show respect to the ideas of others
- Responses that dig deeper into assignment questions or issues.

To determine your actual grade on a Discussion Board, I have two methods.

Method One: For some DBs, I will add up all of the quality responses for each individual in your section of the course and come up with the average for the class. Your grade will be based on your quality participation in relation to that of the class. This means that each Discussion Board will be different as some are more in depth than others, some have more or fewer aspects to be considered, some are more closely related to the literature than to opinion, and some run much longer than others. If you are not assigned a specific minimum number of posts but are only told to participate each day a DB is open, the corresponding DB will be graded by this method.

Method Two: For other DBs, I will assign a specific minimum number of original posts and a specific minimum number of responses. In those cases, your grade will be based upon how well you meet those requirements. If you are assigned a specific minimum number of posts and responses, the corresponding DB will be graded by this method.

Discussion Titles

One thing I would like to point out now is that when you post a discussion thread, it should have an intelligent title. What do I mean by intelligent?

- If you are posting a homework problem, tell the problem number and from what assignment.
- If you are posting an answer to a question I have asked, include some of the question in the title.
- If you are posting general information, give us a taste of what it is about.
- If you are asking a question, tell the topic to which you are referring.

Examples of Good Titles:

Matrix HW - #5
Answer—My future plans
What I did last summer
Question on using my TI-83
Macbeth acted alone

Examples of Bad Titles:

#2 , Answer to what you asked, hey, question, Macbeth assignment

APPENDIX B

Introduction to Threaded Discussions

(Exercise, from Teacher Two)

Goal: This assignment will allow you to become familiar with threaded discussions, a medium that you will use to discuss your readings, assignments, issues, and other topics. This assignment will also allow you to get to know your peers a little. You must make your first post to this DB today, and you should continue to participate in this DB until it ends at midnight EST on Day 5.

Threaded Discussion Topics: For this assignment, we should all reflect on the nature of a discussion. To me, a discussion is an extended, worthwhile communication between the individuals that comprise a group. If I make a statement and no others respond, then I have made a statement. However, if others do respond in order to agree, refute, or ask for clarification, then I have started a discussion, and I can begin to learn with others. Before you have posted one discussion entry, please read the targets for this exercise at the bottom of this page.

Topic 1: Using the third section of your Language Arts Track Record as a starting point, share your views about what novels or plays you believe should be taught in a high school English classroom. When a student suggests a work, you may agree, disagree, or use that suggestion as a starting point for your own suggestion. If you agree or disagree with a student's suggestion, be sure to give specific reasons. You are also welcome to ask discussion questions if you need clarification to remember the novel or play. This cannot be all you do, however.

Topic 2: In this discussion, identify and discuss the roles that fiction and poetry play in our society. What is it that these types of literature possess the potential to do? A logical starting point would be to entertain, but can literature teach? Or remind? Or caution? Or ridicule? Or educate? When you are discussing a specific role, be sure to use examples of literature to support your assertions.

Targets: For this initial threaded discussion, I am concerned about these two things. Work to accomplish both. (These two things also hold true for all other discussions.)

1. Maintain an academic tone. An academic tone will require you to communicate in a mature and measured fashion. Such communication requires proper vocabulary, structures, and attitudes. In the world of academics, we will not say that something "sucked" or attack

somebody on a personal level. If the tone slips, those sloppy individuals will be held accountable.

2. Each entry into the threaded discussion should be a carefully worded, insightful complete sentence. Most discussion entries might appear in a carefully written essay answer. Think and plan before you enter. When extra-impressed with an entry, I have been known to reward the thoughtful.

Remember, when you make a comment in a discussion, please label it so your peers and I can easily see approximate content in your response. Calling a comment "My comment" does not tell us much; titles like "A Different Perspective on *Macbeth*" or "Macbeth is guilty" tell us more of what we need to know. For each discussion in this class, you should post your response to my prompt or question and make several other postings (unless otherwise instructed). You will be graded on the worth of your comments as well as how much you participate in comparison with the rest of the class.

List of 18 codes, with sources and descriptions, in the *expanded social presence* (ESP) model.

Affective Codes	Source	Code Description
1. Emotion	COI	Expressions of emotion
2. Humor	COI/B&B	Any expression intended to be humorous or ironic
3. Sarcasm	COI/B&B	Sarcasm or negative humor (at someone else's expense, intended to wound, belittle, shame or make fun of)
4. Paralanguage	COI	Use of emoticons, or exaggerated punctuation e.g. capitalization, exclamation etc.
5. Self-disclosure	COI/B&B	Reveals personal information about thoughts and feelings, expresses vulnerability
Cohesive Codes	**Source**	**Code Description**
6. Additional resources	COI/B&B	Suggestions about any resources not directly referenced within the course
7. Greetings/salutations/ social niceties	COI	Words or phrases for purely social communication (phatics) e.g. Hi there, How are you?, Happy Thanksgiving!, Sorry about that.
8. Group references	COI	Collective references to the group e.g. we, us, our
9. Social sharing	COI	Talking about factors in local context e.g. school, classroom, staff , environment, community, family, friends, activities
10. Vocatives	COI	Calling other participants by name
Interactive Codes	**Source**	**Code Description**
11. Acknowledgement	COI/B&B	References others' posts
12. Ask/Request/Inquiry	B&B	Asking for facts, evidence, examples, information, opinions, elaboration; broad or open-ended questions; invitation to in-depth discussion.
13. Chastisement	B&B	"Anger, hostility; personal attacks; insults; swearing; dislike; adversariality; unfriendly and destructive comments; rudeness; provocation." (B&B, 2005)
14. Complaint	Boxer	Direct or indirect complaint about a third party

		or event, or invitation to join in complaint sequence; griping, grumbling, commiserating, exchanging troubles.
15. Compliment/agreement	COI/B&B	Compliments or expressess agreement
16. Disagreement/critique	COI/B&B	Polite disagreement or critique
17. Opinion/comment	COI/B&B	Opinion or comment, not backed up by evidence
18. Reserve	B&B	Deliberately attempting to end a discussion thread, by cutting-off or inhibiting further interaction.

COI = Community of Inquiry (Rourke, Anderson, Garrison, & Archer, 2001);

B&B = Interpersonality taxonomy (Beuchot & Bullen, 2005);

Boxer = Boxer (1995)

Positionality Statement

I held a research assistantship with the National Research Center on Rural Education Support (NRCRES) from January 2007 to July 2011, and was involved with the collection of primary data in the *Supporting Distance Learning in Small Rural Schools* project.   Some of my duties included developing the intervention materials, including the training websites, and facilitating the online training for the control and intervention facilitator groups. I was also involved in collecting and transcribing interview data from teachers and facilitators. The interviews consisted of open-ended questions formulated in advance. As such, I had personally spoken with many of the facilitators in the *Supporting Distance Learning* study as well as all the online teachers. However, I had no direct contact with the students in the study, and was not involved in any way in the online discussion, which was part of the course curriculum.

Prior to working on this study, I had had some experience with online and blended learning in a higher education setting, at the College of Medicine and Veterinary Medicine, Edinburgh University, in Scotland. I had the opportunity to do some content analysis of online discussion within the Edinburgh Electronic Medical Curriculum, a virtual learning environment used by the medical students. The students used their online discussion forums for a wide range of communication tasks both course-related and extracurricular, and were evidently conveying emotional content and building community through these interactions.

The current (dissertation) study was a content analysis of secondary data, i.e. transcripts of online discussion that were automatically collected by the Blackboard ™ content management system as part of the online course. Because of my prior experience at Edinburgh University, my expectations were that the high school students in the Supporting Distance Learning study, like the medical students in Scotland, would also be conveying emotion and building community through online discussion. My decision to utilize the social presence component of the Community of Inquiry framework was intended to provide evidence for this.

The content analysis involved coding social presence indicators, most of which were observable and manifest in the text. Coding data is a subjective act in that texts can be approached or analyzed from multiple perspectives. However, the use of an a priori coding scheme is an attempt to constrain a content analysis to a single, objective perspective that can then be compared with other research using the same scheme. Only two of the codes, namely *emotion* and *humor* potentially involved a more subjective decision regarding the purpose of the written text. The a priori coding scheme allows determination of inter-coder reliability to ensure that different coders apply codes in the same way, or that one particular coder is not applying codes in an idiosyncratic manner.

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