6-2018

Instructor Sense of Community and Instructional Practices as Predictors of Student Sense of Community: A Hierarchical Linear Modeling Analysis

Laurie K. Burgess
Western Michigan University, laurie.burgess@cornerstone.edu

INSTRUCTOR SENSE OF COMMUNITY AND INSTRUCTIONAL PRACTICES AS PREDICTORS OF STUDENT SENSE OF COMMUNITY: A HIERARCHICAL LINEAR MODELING ANALYSIS

by

Laurie K. Burgess

A dissertation submitted to the Graduate College
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
Educational Leadership, Research and Technology
Western Michigan University
June 2018

Doctoral Committee:

Andrea Beach, Ph.D., Chair
Sue Poppink, Ph.D.
Sergio da Silva, Ph.D.

INSTRUCTOR SENSE OF COMMUNITY AND INSTRUCTIONAL PRACTICES AS PREDICTORS OF STUDENT SENSE OF COMMUNITY: A HIERARCHICAL LINEAR MODELING ANALYSIS

Laurie K. Burgess, Ph.D.

Western Michigan University, 2018

A positive sense of community (SoC) in the college classroom supports student learning and increases student engagement and motivation. While previous research has examined SoC, studies have typically investigated students' perceptions. This quantitative cross-sectional study investigates both instructor and students' perceptions of SoC in traditional undergraduate classrooms. Study participants include full-time instructors, and students from 36 undergraduate classes in three institutions located in a Midwestern state. Students completed Rovai's (2002a) Classroom Community Scale; instructors completed a remodified Classroom Community Scale and the Postsecondary Instructional Practices Survey (Walter, Henderson, Beach, & Williams, 2016).

This study uses hierarchical linear modeling (HLM) to analyze both student and class-level variables that explain variability of the three constructs of student SoC: Connectedness, Learning, and Total Classroom Community. At the student level, class level is a significant predictor of student SoC in all three constructs. More specifically, seniors experience less SoC than freshmen. Results from the final HLM models provide support that this study identified class-level variables responsible for the variation in student SoC between classes. The construct Connectedness accounts for 67% of variance in student perceptions of SoC between classes; Total Classroom Community resulted in

60% and Learning, 33%. Instructor gender was a significant predictor of students' perceptions of connectedness. Students with female instructors had higher scores on the construct, Connectedness, than students with male instructors. Instructional practices also predict student SoC. Content Delivery, a predictor variable that includes instructor-centered practices, results in a significant negative relationship on all three SoC constructs indicating that when instructors use note-taking or lecture, student perceptions of connectedness, learning, and total sense of community decrease. Instructor perceptions of SoC significantly and positively impact student perceptions of SoC in all three constructs. When an instructor has a greater sense of total classroom community, students have a significantly greater sense of connectedness (effect size = .56) and total classroom community (effect size = .53). Interestingly, the results also show that when an instructor has a greater sense of connectedness (effect size = .42), students' perceptions of learning increase.

The most practical application of this research is instructors adopting student-centered instructional practices in higher education classrooms in order to build SoC. Faculty developers can promote the importance of SoC among faculty by providing faculty development opportunities on student-centered instructional practices. Another practical application of this research includes administration. Administrators can utilize faculty who successfully build SoC in the classroom to mentor and lead others in effectively building SoC. Based on this research, educators and researchers must recognize SoC as an effective instructional factor in higher education classrooms that provides students with opportunities to interact with faculty and fellow classmates in a meaningful and academically challenging learning environment.

ACKNOWLEDGMENTS

The support and patience from my family during this journey cannot go without acknowledgement. Chris, thank you for all the ways you have supported me throughout this process: cheering me on, continually encouraging me, and providing me with guilt-free time and space to work. You are an amazing partner, husband, and father. Taylor, Christian, and Jordan, thank you for accepting my limitations and understanding the process of writing a dissertation that sometimes took me away from our time together. God has blessed our family; each of you is a gift.

I would also like to acknowledge and thank my committee for the time they invested in my learning, research, and writing. I am more confident in my ability because of their support and direction. Dr. Andrea Beach, thank you for taking the chair and leadership role on my committee; you provided me with support and encouragement. Dr. Sue Poppink, thank you also for your help; I have valued your expertise and high expectations. Dr. Sergio deSilva, thank you for all the hours you spent patiently working with me to organize and clean my data. Your kindness is a gift.

Finally, I must acknowledge Dr. Ron Kronemeyer for suggesting I pursue my Ph.D. and for believing in me. Ron, I am a better educator and learner because of you. Thank you for investing in me and for being my friend.

Laurie K. Burgess

This dissertation is dedicated to my mom, Marilyn Holkeboer.

TABLE OF CONTENTS

ACKNOWLEDGMENTS ii

DEDICATION iii

LIST OF TABLES ix

LIST OF FIGURES xi

CHAPTER

I INTRODUCTION 1

Background 1

Problem Statement 4

Purpose Statement and Research Questions 6

Methods Overview 8

Conceptual Framework 9

Significance of Study 11

Chapter I Summary 12

II LITERATURE REVIEW 14

Learning and Instruction in Higher Education 15

Changes in Higher Education Teaching and Learning 15

Teacher-Centered vs. Learner-Centered Pedagogy 18

Social Constructivism 20

Collaborative Learning 20

Definition of collaborative learning 20

History of collaborative learning 22

Table of Contents – continued

CHAPTER

Benefits and challenges of collaborative learning 23

Perceptions of collaborative learning..... 26

Gender..... 32

The instructor..... 32

Student experiences in the classroom 35

Community 37

Definition of Community..... 37

Background..... 38

Sense of Community Theory 39

Benefits of Community..... 41

Elements of Sense of Community..... 44

Conditions that Support Sense of Community..... 46

Classroom learning environment..... 46

The instructor..... 47

The student..... 52

Collaborative learning..... 54

Student and Instructor Perceptions of Community..... 55

Student perceptions..... 56

Instructor perceptions..... 57

Instruments to Measure Community..... 59

Problem Statement..... 61

Chapter II Summary..... 62

Table of Contents – continued

III METHOD 63

Research Design 64

Population, Sample, and Site 65

Instrumentation 66

Data Collection Procedures 71

Data Analysis Plan 74

Limitations 77

Chapter III Summary 77

IV RESULTS 79

Overview of Purpose and Questions 79

Description of Data 80

Research Question 1 85

Research Question 2 92

Research Questions 3 – 5 99

Unconditional Models 100

Conditional Models 102

Connectedness 104

Learning 110

Total Classroom Community 115

Chapter IV Summary 120

V DISCUSSION 121

Summary of Major Results 121

Connectedness 123

Table of Contents – continued

CHAPTER

Learning 124

Total Classroom Community 124

Relationship of Results to Existing Studies 125

Implications for Practice 128

Limitations and Recommendations for Future Research 130

REFERENCES 133

APPENDICES 146

A Email to Potential Participants 146

B Permission to use Instruments 148

C Classroom Community Scale for Students 152

D Classroom Community Scale and Postsecondary Instructional Practices Survey for Instructors 158

E Approval Letters from the Human Subjects IRB 166

F Informed Consent Form 170

G Classroom Script 173

H Crosswalk Table 175

I Correlation Matrix 179

J Descriptive Statistics of Students for the Classroom Community Scale Subscales Items and Total Classroom Community 181

K Descriptive Statistics of Instructors for the Classroom Community Scale Subscales Items and Total Classroom Community 183

L Descriptive Statistics of Instructors for the Postsecondary Instructional Practices Survey Items by Construct and Category 185

LIST OF TABLES

1. Original Classroom Community Scale Items and Deale and White's Modified Scale Items 69

2. Deale and White's Modified Classroom Community Scale and Remodified Scale Items 69

3. Student Response Rate 81

4. Demographics and Characteristics of Instructor Participants 83

5. Demographics and Characteristics of Student Participants 84

6. Descriptive Statistics and Cronbach's Alphas of Instructors and Students for the Connectedness, Learning, and Total Classroom Community Subscales 87

7. Means and Standard Deviations of Instructors for Demographic Characteristics 88

8. Means and Standard Deviations of Students and Instructors by Institution and Class 89

9. Means and Standard Deviations of Students for Demographic Characteristics 93

10. Regression Coefficients Predicting Student Connectedness, Learning, And Total Classroom Community 98

11. Hierarchical Linear Modeling Results of the Unconditional Models 101

12. Hierarchical Linear Modeling Results of the Partially Conditional Model (Level 1) for Connectedness 105

13. Hierarchical Linear Modeling Results of the Fully Conditional Model for Connectedness 106

14. Means, Standard Deviations, and Cronbach's Alphas for the Postsecondary Instructional Practices Two and Five Factor Models 108

15. Hierarchical Linear Modeling Results of the Partially Conditional Model (Level 1) for Learning 111

16. Hierarchical Linear Modeling (HLM) Results of the Fully Conditional Model for Learning 112

List of Tables – continued

17. Hierarchical Linear Modeling Results of the Partially Conditional Model (Level 1) for Total Classroom Community 116

18. Hierarchical Linear Modeling (HLM) Results of the Fully Conditional Model for Total Classroom Community 117

LIST OF FIGURES

1. A conceptual framework to examine instructor and student perceptions of SoC in the traditional postsecondary classroom 10

CHAPTER I

INTRODUCTION

This study examined student and instructor perceptions of sense of community (SoC) in the postsecondary traditional classroom. Furthermore, this study determined whether there was a relationship between student and instructor perceptions of community and instructional methods and whether those perceptions align. Since there were differences, it was worth investigating factors, such as instructional methods, that contributed to differences in perceptions. Because learning is enhanced and students are engaged because of sense of community in the classroom (Summers & Svinicki, 2007; Tinto, 1997), investigating ways to determine different perceptions and factors that affect perceptions of community can lead to improved classroom experiences for both students and instructors. For the purpose of this study, the term *community* referred to a sense of social belonging in the classroom (Summers, Bergin, & Cole, 2009). According to Rovai (2001), community within an educational setting is a "culture of learning in which everyone is involved in a collective effort of understanding" (p. 42).

Background

Creating community in higher education classrooms has become a topic of interest among scholars in higher education (Burdett, 2007; Vaccaro, Daly-Cano, & Newman, 2015), and is recognized as playing "an integral role in the advancement of student learning" (Summers & Svinicki, 2007, p. 57). Collaborative learning is an effective instructional approach that serves to promote community in the classroom. This approach focuses on team members becoming partners in the construction of shared knowledge (Van den Bossche, Gijselaers, Segers, & Kirschner, 2006).

The constructivist revolution in the 1980s led to the implementation of different instructional practices in primary and secondary education in order to support learners actively constructing knowledge. Higher education institutions also began implementing different instructional methods as research revealed the benefits of having students collaborate as they learn, which reflected the transition from teacher-centered approaches to teaching and learning to learner-centered approaches (Colbeck, Campbell, & Bjorklund, 2000; Dawson, 2006). Learner-centered approaches require students to be active participants in the learning process, which maximizes their learning (Umbach & Wawrzynski, 2005). Tinto (1997) states that "student learning is enhanced when students are actively involved in learning and when they are placed in situations in which they have to share learning in some positive, connected manner" (p. 601). He also suggests that the quality of learning in a collaborative learning environment is deeper and richer than a traditional non-collaborative classroom setting (Tinto, 1997).

Furthermore, students' connectedness to the campus community predicts students' connectedness in the classroom (Summers & Svinicki, 2007). Summers, Beretvas, Svinicki, and Gorin (2005) stated that community on campus should begin by "adopting a philosophical and pedagogical framework that supports community at the classroom level by using instructional approaches that focus on collaborative learning" (p. 166). Therefore, a significant aspect of creating community in a learning environment is providing opportunities for students to work together and collaborate. The "students' experience of positive group processes in higher education settings may relate to their feelings of community in the class itself" (Summers et al., 2005, p. 171).

Studies support that the collaborative learning methods used in higher education classrooms increase students' motivation and learning and can help build a sense of

belonging within the classroom community (Burdett, 2007; Johnson & Johnson, 2009; McMillan, 1996; Perumal, 2008; Robinson & Kakela, 2006; Solimeno, Mebane, Tomai, & Francescato, 2008; Summers et al., 2009; Summers & Svinicki, 2007; Walker, Daniels, & Emborg, 2008). The role of the instructor impacts students' perceptions of community in the classroom (Gitterman, 2004; Kember, Leung, & Ma, 2007; Robinson & Kakela, 2006; Summers et al., 2009) and can influence the quality of students' learning and educational experience by "encouraging cooperation among students, encouraging active learning, communicating high expectations, encouraging contact between students and faculty, and using active learning techniques" (Umbach & Wawrzynski, 2005, p. 156).

The research on student and instructor perceptions of collaborative learning within the learning environment conflicts. Several studies have suggested that students' perceptions of collaborative learning are positive (Bergom, Wright, Brown, & Brooks, 2011; Cabrera, Crissman, Bernal, Nora, Terenzini, & Pascarella, 2002; Gottschall & García-Bayonas, 2008; Summers et al., 2005; Summers et al., 2009; Ventimiglia, 1994). Colbeck et al. (2000) state that college students who participate in group projects share positive attitudes about learning. "The students we interviewed indicated that participation in group projects improved communication, conflict management, and problem solving skills" (Colbeck et al., 2000, p. 79). However, some studies reveal students' negative perceptions of collaborative learning (Brown & McIlroy, 2011; Gale, Martin, & Duffey, 2014; Gottschall & García-Bayonas, 2008). Research provides possible reasons for students' positive and negative perceptions of collaborative learning, such as instructor planning and involvement, group cohesiveness, individual workload, communication, and lack of control.

Research on instructors' perceptions of collaborative learning also reveals mixed conclusions. On one hand, Smith (2011) states, it "seems safe to assume that cooperative learning (or something like it or based on it) has been embraced by higher education faculty" (p. T3E-4). This belief is reflected by other researchers (Colbeck, Cabrera, & Marine, 2002; Gottschall & García-Bayonas, 2008). However, according to Catalano and Catalano (1999), "while some faculty have embraced active learning with enthusiasm, others remain more cautious" (p. 59). Prosser and Trigwell (2014) suggest that adopting learner-centered approaches and perspectives to teaching such as collaborative learning may depend on an instructors' "willingness to confront and change their conceptions and understanding of what constitute high-quality teaching and learning in higher education" (p. 794).

Students' perceptions of sense of community are frequently considered as an important contribution to understanding classroom community (Booker, 2008; Frymier, 1993; Hirschy & Wilson, 2002; Ritter, Polnick, Fink II, & Oescher, 2010; Summers & Svinicki, 2007; Velasquez, Wilkerson, & Misch, 2011; Weaver & Qi, 2005; Wendt & Rockinson-Szapkiw, 2015). These studies have mainly focused on students' motivation and participation in class, their perceptions of the instructor, and their perceptions of learning and academic achievement. According to Kay, Summers, and Svinicki (2011), few studies have centered on instructor perceptions of sense of community.

Problem Statement

Ernest Boyer (1990), author of *Campus Life: In Search of Community*, mentioned community among several problems within higher education institutions. He called on higher education personnel to emphasize building community on campus among students, faculty, and staff. This landmark report led to an acknowledgement among

scholars in higher education that developing community may require learner-centered approaches that begin in the classroom (Summers et al., 2005). Since Boyer's report, interest in community in classrooms in higher education has increased (Summers et al., 2005).

Although there is growing research and interest in classroom community, there are still gaps. Much of the research on classroom community in higher educational institutions focuses on students' perceptions of learning (Hirschy & Wilson, 2002; Summers & Svinicki, 2007; Tinto, 1997; Valesquez et al., 2011; Wendt & Rockinson-Szapkiw, 2015), measures to assess students' perceptions of community (McMillan & Chavis, 1986; Rovai, 2002b; Summers et al., 2005), the degree of influence instructors and peers have on student perceptions of classroom community (Booker, 2008), building community (Ashar & Skenes, 1993; Green & Fink, 2010; Modell, DeMiero, & Rose, 2009; Nixon, Marcelle-Coney, Torres-Greggory, Huntley, Jacques, Pasquet, & Ravachi, 2010; & Rovai, 2002b; Vaccaro, et al., 2015), instructor characteristics that support community (Booker, 2008; Freeman, Anderman, & Jensen, 2007; Summers et al., 2009), instructional methods that support community (Summers et al., 2009; Summers et al., 2005; Summers & Svinicki, 2007), student satisfaction and sense of community (Brown, 2001; McInnerney & Roberts, 2004; Rovai & Wighting, 2005), and student motivation connected with community (Freeman et al., 2007; Kember, Ho, & Hong, 2010; Pike, Kuh, & McCormick, 2011; Rovai, 2002b; Summers & Svinicki, 2007). Furthermore, "in empirical and theoretical discussions of classroom community, the primary issues of analyses have been what students do outside of the classroom setting" (Booker, 2008, p. 12). Summers and Svinicki (2007) stated that "research on classroom community has been associated with classroom interaction strategies, such as cooperative learning groups

(Johnson & Johnson, 2009), but community itself has yet to be demonstrated empirically in higher education contexts" (p. 55). According to Hew and Cheung (2003), students' sense of community has been assessed by predominantly qualitative methods. More recently, the research discussions surrounding sense of community (SoC) have focused mostly on online class structures (Dawson, 2006; McInnerny & Roberts, 2004; Rovia, 2002a; Rovia, 2002b; Rovai & Wighting, 2005; Ritter et al., 2010).

Although there are several studies on student perceptions of SoC, there is very little research on instructors' perceptions (Kay et al., 2011). Currently, no studies consider how instructor perceptions of SoC influence students' perceptions of SoC. Therefore, this study considered the relationships between specific independent variables (student and instructor characteristics, instructional methods) on the dependent variable (student perceptions of SoC). The study also addressed whether instructor and student perceptions of SoC aligned and whether instructor perceptions influence students' perceptions. If SoC increases students' learning, but instructors do not assess the SoC in their classrooms in the same way students do, or are not utilizing ways to facilitate classroom community, instructors may not be supporting student learning effectively.

Purpose Statement and Research Questions

Research suggests that a positive sense of community in the college classroom supports student learning and increases student engagement and motivation (Freeman et al., 2007; Kember et al., 2010; Pike et al., 2011; Rovia, 2002b; Summers & Svinicki, 2007; Tinto, 1997). Although creating community in postsecondary classrooms has become a topic of interest among scholars in higher education (Burdett, 2007), many instructors continue to use traditional, teacher-centered approaches such as lecture that may not support community (Colbeck et al., 2000; Summers et al., 2005; Summers &

Svinicki, 2007). Little research has considered the relationship between instructor and student perceptions of community (Kay et al., 2011). If creating community in the college classroom has positive effects on learning, it is important to investigate instructor and students' perceptions of community in the classroom in order to determine whether they align.

The purpose of this study was to examine instructor and student perceptions of SoC in the traditional postsecondary classroom. More specifically, this study focused on whether there was an alignment between instructor and students' perceptions of SoC and whether that alignment or misalignment influenced students' perceptions of SoC and their learning. Instructional methods, student characteristics (gender, class level, repeat instructor, campus living) and instructor characteristics (gender, years teaching, discipline) were also considered as predictor variables on the outcome variable, students' perceptions of SoC.

The following questions guided this study:

1. To what extent is there a difference between instructor and students' perceptions of SoC?
2. What is the influence, if any, of student characteristics (gender, class level, repeat instructor, campus living) on students' perceptions of SoC?
3. What is the influence, if any, of instructor characteristics (gender, years teaching, discipline) on students' perceptions of SoC?
4. What is the influence, if any, of instructional methods on students' perceptions of SoC?
5. To what extent, if any, do instructor perceptions of SoC influence students' perceptions of SoC?

Methods Overview

This study examined individual- and class-level predictors of undergraduate student perceptions of SoC in postsecondary traditional classrooms. A quantitative cross-sectional design was used in this study. A questionnaire was appropriate for measuring participants' perceptions because "there are … numerous facts about the behaviors and situations of people that can be obtained only by asking a sample of people about themselves" (Fowler, 2009, p. 2). Since this design was cross-sectional, data were collected at one point in time by a questionnaire. Therefore, the sample was accessible, and I limited attrition by giving the questionnaire face-to-face.

Study participants were drawn from 36 undergraduate courses including full-time instructors and under and upperclassmen students from three colleges and universities located in a Midwestern state. Each course was taught by one instructor and had at least 20 students. Students' perceptions of SoC were measured by Rovai's (2002a) Classroom Community Scale (CCS), and instructors' perceptions were measured by a remodified Classroom Community Scale (Deale & White, 2012). The instructor's questionnaire also included the Postsecondary Instructional Practices Survey (PIPS) that measured self-reported teaching practices. Each class was identified and coded by institution and class. Data were analyzed by independent t-tests, Analysis of Variance (ANOVA), and regression models. Two-level hierarchical linear models tested the effects of student-level predictors and instructor and class-level predictors on the outcome variable, student perceptions of SoC. The outcome variable was divided into three constructs based on Rovai's (2002a) CCS instrument: Connectedness, Learning, and Total Classroom Community.

Conceptual Framework

The Sense of Community theory, revised by McMillan in 1996, provided a theoretical foundation for this study. McMillan and Chavis (1986) originally hypothesized four elements of the Sense of Community that became recognized as the Sense of Community (SoC) theory. McMillan revised the theory and determined seven elements of psychological sense of community: spirit, emotional safety, boundaries, sense of belonging, trust, trade, and art. These seven elements of SoC will be evident in classrooms that have a strong sense of community measured by the Classroom Community Scale (CCS) (Rovai, 2002b) in this study. Items in the CCS such as "I feel that students in this class care about each other"; "I feel connected to others in this course"; "I feel that this course is like a family"; "I trust others in this course"; and "I feel that members of this course depend on me" reflect dimensions such as emotional safety, sense of belonging, trust, and trade in McMillan's theoretical framework.

Within the classroom community, several elements influence instructor and student perceptions of SoC, such as instructional methods, characteristics of individual students, and characteristics of the instructor. The instructor's perceptions may differ from individual students' perceptions. Furthermore, the instructor's perceptions of SoC may even affect student perceptions of SoC. The conceptual framework in Figure 1 shows these key constructs and their relationships to student perceptions of SoC. More specifically, the framework predicts relationships between student characteristics, instructor characteristics, instructional methods and student perceptions of SoC. The model also predicts that instructor perceptions of SoC can influence student perceptions of SoC.

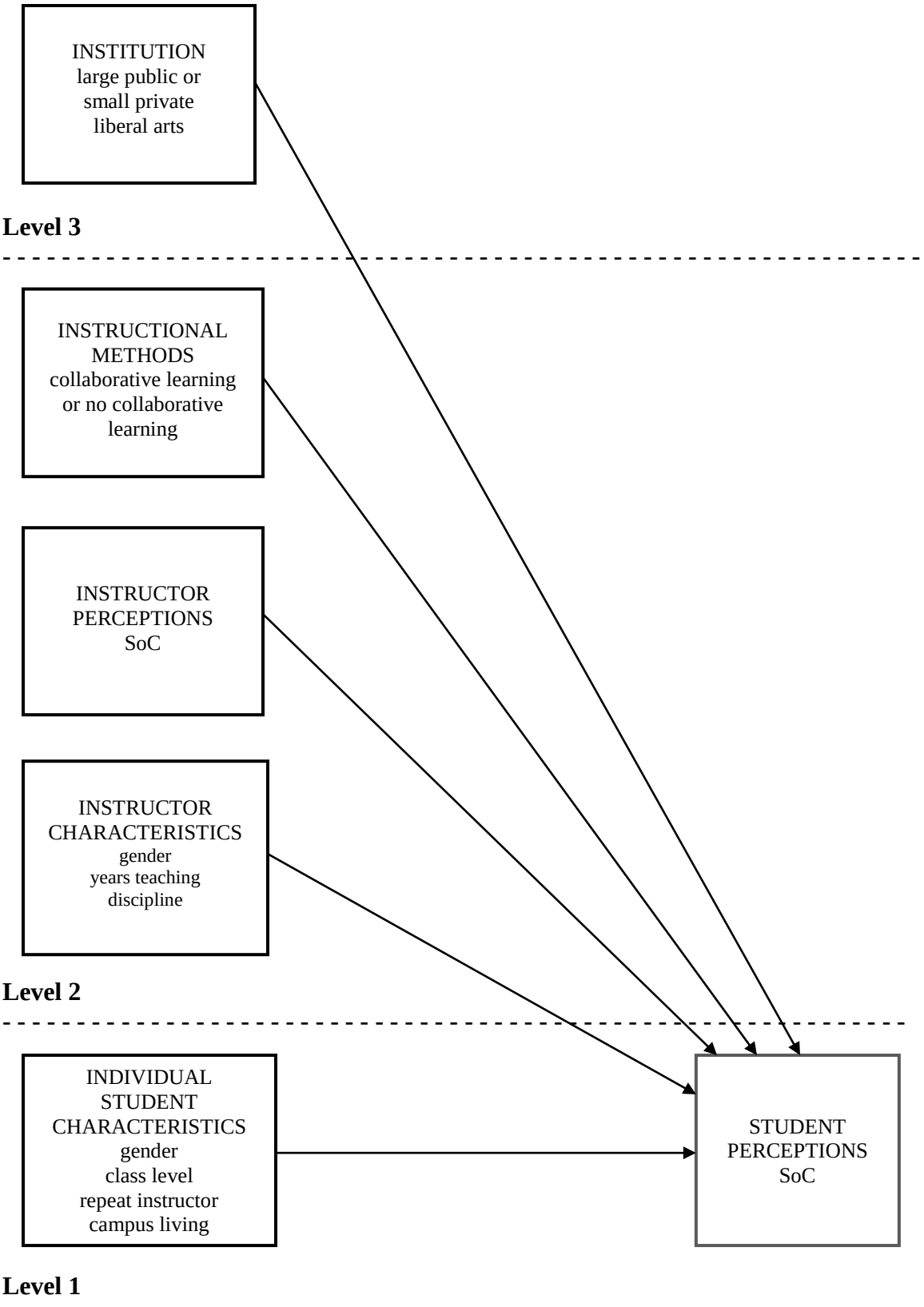

Figure 1. A conceptual framework to examine instructor and student perceptions of SoC in the traditional postsecondary classroom. SoC = Sense of Community

Significance of Study

According to Hirschy and Wilson (2002), "a broader view of improving undergraduate education reinforces the need to understand the social dynamics in a classroom" (p. 96). Although there have been studies on students' perceptions of SoC in the classroom and students' perceptions of learning in classrooms with community, little is known regarding the relationship between instructor and students' perceptions of SoC in the classroom. Furthermore, very little research has been done on instructor perceptions of SoC. Therefore, it is important to study whether there is an alignment between instructor perceptions of SoC and student perceptions of SoC since these variables have not been considered together.

Positive SoC in the classroom supports student motivation, academic success, and retention; therefore, determining an alignment or misalignment between instructor and students' perceptions of community will be beneficial to the research community. If an instructor thinks SoC is present in the classroom and the students do not, the instructor may not be using effective approaches to enhance SoC. Since SoC positively affects learning, motivation, and retention, the instructor would benefit from knowing specific factors that affect community in order to better increase SoC in the classroom. These findings may lead to discovering ways to support student learning and inform instructors' decisions regarding effective instruction and classroom management that support SoC within a postsecondary traditional classroom.

Furthermore, the amount of research conducted on SoC in an online classroom (Rovai & Jordan, 2004) supports the importance of further research in traditional face-to-face classrooms. Research in online classrooms suggests that sense of belonging can be

jeopardized in a virtual environment and thus supports the importance of sense of belonging in a traditional classroom environment. The amount of research on building community in an online classroom and its importance in learning implies that instructors must be aware of students' SoC and ways to incorporate community into a virtual environment. Therefore, further research that centers on understanding SoC in a traditional face-to-face classroom could build upon the findings that support the importance of SoC in teaching and learning.

Chapter I Summary

Research on community in the college classroom has revealed that creating a sense of belonging among students and the instructor benefits students' learning (Summers & Svinicki, 2007; Tinto, 1997) and motivation (Freeman et al., 2007; Kember et al., 2010; Pike et al., 2011; Rovai, 2002b; Summers & Svinicki, 2007). Effective instructional methods and classroom management approaches also support and contribute to this sense of community (Johnson, Johnson, & Smith, 1991; Summers et al., 2009; Summers et al., 2005; Summers & Svinicki, 2007; Van den Bossche et al., 2006). When the instructor and students feel a sense of community, the classroom not only becomes a place where each person belongs, but a space for enhanced learning opportunities (Rovai, 2002b) and personal development (Rovai & Wighting, 2005).

The purpose of this study was to examine instructor and student perceptions of SoC in the traditional postsecondary classroom. More specifically, this study focused on whether there was an alignment between instructor and students' perceptions of SoC and whether that alignment or misalignment influenced students' perceptions of SoC and their learning. This knowledge may allow us to better understand classroom community

and the relationship between student and instructors' perceptions of SoC, which may provide insight into effective teaching and learning in higher education.

In the next chapter, three major areas of study will be reviewed from the literature: 1. learning and instruction in higher education; 2. community; and 3. instructor and students' perceptions. Participants, procedures, instruments, and data analysis for the current study are discussed in Chapter 3. Chapter 4 provides the statistical results of the study, and Chapter 5 will discuss the results and implications for practice and further research.

CHAPTER II

LITERATURE REVIEW

Creating community in college classrooms has become a topic of interest among scholars in higher education (Burdett, 2007), and is recognized as playing "an integral role in the advancement of student learning" (Summers & Svinicki, 2007, p. 57). As a result of the shift from an Instructional Paradigm to a Learning Paradigm (Barr & Tagg, 1995), more learner-centered approaches to teaching and learning have been reflected in higher education classrooms. The constructivist revolution in the 1980s led to the implementation of different instructional practices in primary and secondary education in order to support learners actively constructing knowledge. Higher education institutions also began implementing these different instructional methods as research revealed benefits from having students collaborate as they learn (Colbeck et al., 2000). Collaborative learning is an effective instructional approach that serves to promote community in the classroom. This approach focuses on team members becoming partners in the construction of shared knowledge (Van den Bossche et al., 2006).

The importance of classroom community in higher education has been recognized as an important part of students' undergraduate experience. Students' connectedness to the campus community, according to Summers and Svinicki (2007) predicts students' connectedness in the classroom, especially classrooms that used collaborative learning methods. Summers et al. (2005) also state that community on campus should begin by "adopting a philosophical and pedagogical framework that supports community at the classroom level by using instructional approaches that focus on collaborative learning" (p. 166). Therefore, a significant aspect of creating community in a learning environment is providing opportunities for students to work together and collaborate. The "students'

experience of positive group processes in higher education settings may relate to their feelings of community in the class itself" (Summers et al., 2005, p. 171).

The following literature review will discuss issues that surround community in the college classroom: learning and instruction, community, and student and instructor perceptions.

Learning and Instruction in Higher Education

Changes in Higher Education Teaching and Learning

When discussing American education, Weaver and Qi (2005) note that "our educational system is hierarchical, competitive, and individualistic, and … encourages public displays in intellectual exchange and argument" (p. 578). Hirschy and Wilson (2002) echo this sentiment when discussing higher education, "…the American higher education system reflect the dominant, Euro-American, Western cultural norms. Characteristics of the Western worldview include emphasizing competition, individual achievement, an nuclear family, and a task orientation" (p. 91). These characteristics are still reflected in both K-12 and higher education.

Historically, higher education was designed for the elite, and promoted exclusion. Change occurred in the 1950s when the GI bill was passed to benefit soldiers returning from World War II where "40% of the eligible age group enrolled" (D'Andrea & Gosling, 2005, p. 80). This marked a transition in higher education from being an elite system to a mass system where the traditional practices and systems did not support the changing student demographic. Higher education institutions, according to D'Andrea and Gosling (2005), needed to become inclusive learning communities that required "a shift from the assimilationist model, 'students must fit in to what we provide,' to one that incorporates greater responsibilities to the needs of students" (p. 85).

"As more students enter universities and colleges than ever before, traditional forms of teaching are under increasing pressure to change" (D'Andrea & Gosling, 2005, p. 11). Barr and Tagg (1995) discuss the paradigm shift that is happening in American higher education suggesting that "the paradigm that has governed our colleges is this: A college is an institution that exists *to provide instruction*. Subtly but profoundly we are shifting to a new paradigm: A college is an institution that exists *to produce learning*" (p. 13). The Instruction Paradigm, according to Barr and Tagg, is becoming recognized as an ineffective approach to teaching in higher education. Furthermore, Barr and Tagg (1995) suggest that "we now see that our mission is not instruction but rather that of producing *learning* with every student by *whatever* means work best" (p. 13). In the next section, I will discuss teacher-centered and learner-centered pedagogy, which reflects the paradigm shift suggested by Barr and Tagg.

Not only are more students entering colleges and universities, the students who are entering reflect a more diverse population. "Students who enter colleges and universities differ in their backgrounds; likewise, their experiences in the college environment vary" (Hirschy & Wilson, 2002, p. 86). Hirschy and Wilson (2002) suggest that "a nonhierarchical mutually supportive classroom dynamic that supports differences" (p. 95) should include good practices that benefit students from a variety of backgrounds. Therefore, the Learning Paradigm, rather than the Instruction Paradigm, will best serve students of various backgrounds (Barr & Tagg, 1995). "Under the older paradigm, colleges aimed to provide access to higher education, especially for historically under-represented groups such as African-Americans and Hispanics. Too often, mere access hasn't served students well. Under the Learning Paradigm, the goal for under-represented

students (and all students) becomes not simply access but success" (Barr & Tagg, 1995, p. 15).

Research has supported the shift from the Instruction Paradigm to the Learning Paradigm. For example, the National Survey of Student Engagement's (NSSE) first national report, NSSE 2000: National Benchmarks of Effective Educational Practice, provided findings that defined benchmarks for educational approaches that lead to student engagement including level of academic challenge, active and collaborative learning, student interactions with faculty members, enriching educational experiences, and supportive campus environment (NSSE, 2000). The purpose of the NSSE is to promote and support thinking and discussion about the quality of higher education. Based on the report, "some important policy questions are emerging about the most responsible, productive ways that NSSE data can be used to steer public conversations about collegiate quality toward a focus on student learning" (Kuh, 2001, p. 14). Velasquez et al. (2011) also note that several studies have built on NSSE's findings that emphasize "the importance of creating a supportive classroom environment and of actively involving students in the classroom experience" (p. 98).

Social involvement has also been emphasized as an important element in supporting students' experiences and learning in higher education. According to D'Andrea and Gosling (2005), "learning is a social, as well as an individual, process" (p. 79). Tinto (1997) also states,

> Student social involvement in the educational life of the college, in this instance through the educational activity structure of the curriculum and classroom, provides a mechanism through which both academic and social involvement arises and student effort is engaged. The more students are involved,

> academically and socially, in shared learning experiences that link them as learners with their peers, the more likely they are to become more involved in their own learning and invest the time and energy needed to learn. (p. 615)

Teacher-Centered verses Learner-Centered Pedagogy

According to Barr and Tagg (1995), "in the Learning Paradigm, learning environments and activities are learner-centered and learner-controlled" (p. 21). Teacher-centered pedagogy, based on the Instruction Paradigm, is often reflected when "the professor typically 'leads' the class, defines what is to be learned, identifies the activities and readings students are to undertake, and determines how student performance will be evaluated" (Weaver & Qi, 2005, p. 573). Within the teacher-centered approach, the professor lectures to passive students who must recall and recite the information on exams. The following statistics about classroom participation demonstrate that there is still an imbalance of faculty and student participation in the postsecondary classroom: professors talk 80% of the time in class; 10 in 40 students actively participate in class discussions with about 5 dominating the discussion (Weaver & Qi, 2005). Although the paradigm shift from Instruction to Learning is occurring in higher education, many instructors still use traditional approaches in their classrooms that reflect a teacher centered pedagogy.

Dawson (2006) suggests that higher education is shifting from a teacher-centered pedagogy to a learner-centered pedagogy. Umbach and Wawrzynski (2005) argue that learning-centered approaches maximize student learning. Tinto (1997) also recognizes the importance of learner-centered instruction and states that "student learning is enhanced when students are actively involved in learning and when they are placed in situations in which they have to share learning in some positive, connected manner" (p.

601). In fact, he argues that the quality of learning in a collaborative learning environment is deeper and richer than a traditional non-collaborative classroom setting.

Learner-centered approaches require students to be active participants in the learning process. VanderStaay, Faxon, Meishchen, Kolesnikov, and Ruppel (2009) suggest that active learning involves students who "learn more through problem solving and mutual assistance than through commands and obedience," and that "the freedom and responsibility to make their own mistakes, choices, and discoveries is a requirement of their progress" (p. 7). Hirschy and Wilson (2002) argue that "active learning maximizes student involvement in learning with other students and promotes students' responsibility for their intellectual growth" (p. 94). Furthermore, when students are actively involved in the learning process, they are more apt to think critically and retain information they may have otherwise lost (Weaver & Qi, 2005). McInnerney and Roberts (2004) suggest that students must be thinking with the instructor by thinking ahead and constantly testing their own conceptions.

According to Dawson (2006), "a focus on socially constructed networks and interactions is more aligned with current perceptions of effective approaches to learning" (p. 154). When the collaborative classroom reflects an interdependent community, students and the instructor share the common goal to work together to increase understanding. The classroom environment provides an opportunity for students and instructors to interact socially while working together to learn. Tinto (1997) supports this notion when he states, the "…role of the classrooms in student academic and social involvement leads us to the recognition of the centrality of the classroom experience and the importance of faculty, curriculum, and pedagogy to student development and

persistence" (p. 617). Therefore, learning in community requires a shift from a teacher centered environment to a learner-centered environment.

Social Constructivism

Vygotsky's (1978) social constructivist theory emphasizes the influence of language and sociocultural contexts on learning and can be defined as an approach to learning in which individuals construct knowledge in collaboration with others. "All cognitive functions must be explained as products of social interactions and that learning is not simply the accumulation of new knowledge by learners; it is the process by which learners are integrated into a knowledge community" (Rovai & Wighting, 2005, p. 100).

Social constructivism provides a theoretical lens to consider the impact of learner-centered instruction and collaborative learning on sense of community in the postsecondary classroom. Dawson (2006) recognized the effect that social constructivism has had on teaching and learning,

> Contemporary educators are embracing socio-constructivist practices which emphasize learning as a social and interactive activity. As a result of this pedagogical philosophy (social constructivism) there has been an increased importance placed on implementing educational practices that seek to foster the concept of community. (p. 153)

Collaborative Learning

Definition of collaborative learning

Since 1990, higher education institutions have increasingly acknowledged and implemented collaborative learning approaches in the classroom since it offers "an alternative to traditional, lecture-style, authority-oriented classrooms" (Hirschy & Wilson, 2002, p. 94). Collaborative learning is a learner-centered approach to instruction

and provides an effective avenue for implementing a social constructivist philosophy into the postsecondary classroom. According to Wang (2007), "Collaborative learning, based on sociocultural learning theories, provides learners with more effective learning opportunities. Students learn in a community-of-learners environment, where they act as community members" (p. 150).

Collaborative learning refers to instructional use of small groups that encourage students to build meaning and reach mutually shared knowledge. Cooperative learning refers to a formal or structured form of collaborative learning. Both "…collaborative learning and cooperative learning – fit under the umbrella term active learning" (Hirschy & Wilson, 2002, p. 94). Gale et al. (2014) provide this definition: "collaborative learning is defined as an instructional design delivery that encourages students to work cooperatively through social interaction and shared intellectual efforts toward a common outcome" (p. 18). For the purpose of this paper, cooperative learning will be used within the category of collaborative learning.

Several terms have been used in research to refer to collaborative learning and instructional approaches that involved learning with others. "The terms *collaborative learning, small group* work and *group-based activities* are often used interchangeably in the literature to express the concept of students working together on a shared learning activity" (Brown & McIlroy, 2011, p.688). According to Summers et al. (2009), "collaborative approaches range from brief informal interaction to semester-long formal interaction" (p. 294). For the purpose of this section, terms such as cooperative learning, group projects, group work, and group learning activities (GLAs) will be used to discuss student and instructor perceptions of collaborative learning.

Collaboration within the classroom may be formal or informal. A formal approach may occur when an instructor puts groups together to work on an assignment and hand in a product after completion of the assignment. An example of an informal approach in the classroom may be when students are asked to turn to other classmates and discuss a problem provided by the instructor (Summers et al., 2009). In either approach, Walker et al. (2008) suggest two goals when implementing collaborative learning in the classroom: "1. create a comfortable and safe environment for learning and interaction, (and) 2. foster both dialogue and deliberation" (p. 23). Kember et al. (2007) state that students need to be prompted and encouraged to explore issues themselves. In this way students take ownership of their learning and become engaged in the learning process.

History of collaborative learning

Collaborative learning, according to Johnson and Johnson (2009), is one of the few instructional strategies that have been successfully implemented in the last half century. "Although many teaching procedures have been recommended over the past 60 years, very few are still around. Almost none are as wide-spread and institutionalized into instructional practices as is cooperative learning" (Johnson & Johnson, 2009, p. 375). Prior to the 1980s, collaborative learning was unused and fairly unknown. In the 1940s and 1950s there was cultural resistance to cooperative learning because of social Darwinism that encouraged competition. When competition was criticized during the 1960s, the cultural resistance to cooperative learning turned toward individualism, "the view that strong individuals were built by isolating each student and having students learn by themselves without interacting with classmates" (Johnson & Johnson, 2009, p. 365). Therefore, individualized instructional approaches were emphasized such as

behavior modification, based on operant conditioning, and programmed learning which emphasized students going through curriculum at their own pace. Social scientists challenged individualistic learning approaches suggesting that peer interaction and socialization were important factors in learning (Johnson & Johnson, 2009). Collaborative learning became widely used and accepted in the 1980s. It is now "one of the dominant instructional practices throughout the world" (Johnson & Johnson, 2009, p. 365). Not only is collaborative learning widely used in schools, it is also utilized in universities. In fact, according to Johnson and Johnson, it is difficult to find a textbook on instructional methods that does not discuss collaborative learning.

Benefits and challenges of collaborative learning

Social experiences influence an individual's cognitive processes within a learning environment (Vygotsky, 1978). Research has shown that student collaboration is a variable that has a positive effect on educational gains (Solimeno et al., 2008). Group work develops problem solving behaviors, increases student motivation, cognitive development, and overall academic success (Burdett, 2007). More specifically, collaborative learning supports students' construction of shared knowledge and creates an opportunity for meaningful engagement (Van den Bossche et al., 2006; Walker et al., 2008) through active learning emphasizing "constructive individual and group communication through dialogue, argument, and negotiation" (Walker, et al., 2008, p. 21) and encouraging "positive interdependence, accountability, cognitive development, and social development" (Summers, et al., 2005, p. 170). Gale et al. (2014) even suggest that "as collaboration increases quality of work also increases" (p. 27).

Umbach and Wawrzynski (2005) in their research note that students report higher levels of engagement in classrooms that incorporate collaborative learning techniques.

Tinto (1997) states, “indeed, it (collaborative learning) may be the only viable path to greater student involvement” (p. 614). Furthermore, when students work together to divide work and share ideas, understanding and learning outcomes are enhanced (Gale et al., 2014).

According to Van den Bossche et al. (2006), “bringing together people with different experiences, values, and knowledge will be more effective in adequately solving…problems than are individuals” (p. 491). Tinto (1997) also suggests that students benefit from a learning environment that encourages a variety of perspectives. “The sharing of a curriculum and the use of collaborative pedagogy that brought students and faculty together to teach added an intellectual richness to student experience that the traditional pedagogy did not” (Tinto, 1997, p. 613).

Additionally, “participation in a collaborative or shared learning group enables students to develop a network of support – a small supportive community of peers – that helps bond students to the broader social communities of the college while also engaging them more fully in the academic life of the institution” (Tinto, 1997, p. 613). Tinto also suggests that new students are better able to meet both social and academic needs when in a collaborative learning setting.

> Students put more effort into that form of educational activity that enables them to bridge the academic-social divide so that they are able to make friends and learn at the same time. That increased effort leads to enhanced learning in ways that heighten persistence. (Tinto, 1997, p. 615)

Summers et al. (2009) agree that collaborative learning increases peer interaction, an important aspect to students’ socioemotional development within the higher education experience. Group work facilitates understanding others (Robinson & Kakela, 2006) and

benefits students for working environments after graduation (Burdett 2007; Cranmer. 2006; Maguire & Edmondson, 2001). Student collaboration is also a variable that has a positive effect on increasing students' enjoyment of the learning task. Summers and Svinicki (2007) state that "students report significantly higher motivation in courses that use cooperative learning or when students perceive community in their classrooms" (p. 55). Johnson and Johnson (2009) state that, in comparison with competing with peers or working independently, collaboration among peers results in greater psychological health.

> More specifically, cooperativeness is positively related to emotional maturity, well-adjusted social relations, strong personal identity, ability to cope with adversity, social competencies, basic trust and optimism about people, self-confidence, independence and autonomy, higher self-esteem, and increased perspective taking skills. (Johnson & Johnson, 2009, p. 372)

However, collaborative learning in the classroom does not guarantee increased engagement or learning gains. The nature of students' involvement within the classroom experience is also important to consider. Tinto (1997) states that "not all involvements lead to learning in the same fashion. Much depends on the degree to which student involvement is a meaningful and valued part of the classroom experience" (p. 616).

There are challenges involved when incorporating group work into the classroom experience. Working collaboratively with others requires more than just mastery of content; it requires negotiating conflict, coordinating group tasks, and managing interpersonal relationships. "Effective cooperation is based on skilled teamwork as well as on task work" (Johnson & Johnson, 2009, p. 369). Learning with others can be different from students' personal or previous learning styles; thus, students may be

anxious or unenthusiastic about working in groups (Burdett, 2007). Students may avoid group work because they feel "ripped off" and prefer to work alone. Part of the problem, Burdett suggests, is that instructors often do not emphasize the process of teamwork. "As reflective practitioners, academics need to implement strategies to facilitate effective and equitable group processes and outcomes in order to enhance the quality of student learning" (Burdett, 2007, p. 57). According to Johnson and Johnson (2009), students need to be taught interpersonal and teamwork skills in order for effective cooperation and increased student motivation. "Interpersonal and small-group skills form the basic nexus among individuals, and if individuals are to work together productively and cope with the stresses and strains of doing so, they must have a modicum of these skills" (Johnson & Johnson, 2009, p. 369). Gale et al. (2014) agree that instructors need to educate students on how to use successful strategies when working collaboratively as well as discuss the benefits of collaborative learning.

Perceptions of collaborative learning

Research presents conflicting conclusions on students' perceptions of collaborative learning within the learning environment. On one hand, Cabrera et al. (2002) suggest that collaborative learning is preferred among students, "the teaching and learning literature has lauded the benefits of collaborative learning … that not only do White women and minorities prefer collaborative learning settings, so do their White male counterparts" (p. 29). Colbeck et al. (2000) suggest that college students who participate in group projects share positive attitudes about learning. Furthermore, they state that "the students we interviewed indicated that participation in group projects improved communication, conflict management, and problem solving skills" (Colbeck et al., 2000, p. 79). Summers and Svinicki (2007) conducted a study on students'

perceptions of interactive learning as it relates to achievement goals and classroom community:

> We expected that classroom community would be significantly higher in classes that used cooperative learning, and this hypothesis was confirmed. Additionally, mastery orientation and perceptions of interactive learning were significantly higher and performance-approach was significantly lower for students in cooperative learning classrooms. (Summers & Svinicki, 2007, p. 64)

Other research has also suggested that students' perceptions of collaborative learning is positive (Bergom et al., 2011; Gottschall & García-Bayonas, 2008; Summers et al., 2005; Summers et al., 2009; Ventimiglia, 1994).

Instructors may have good intentions when using collaborative instructional approaches, but students may not perceive them the same way. Trigwell and Prosser (1991), when discussing how the learning environment can influence students' approaches to learning, state, "it is the environment as *perceived* by the student, not necessarily the objective environment, which relates to approach to learning" (Trigwell & Prosser, 1991, p. 264). Furthermore, Stes, De Maeyer, Gijbels, and Van Petegem (2012) suggest that

> The educational environment itself is, to a large extent, created by students' experience of curricula, teaching methods, and assessment procedures. Students respond to the situation they perceive, which is not necessarily the same as the situation that their teachers have defined. This also explains why the effects of a new teaching and learning context on student learning are often the opposite of those intended by its designers, precisely because the students concerned see things differently. (p. 400)

Perhaps this explains why some studies reveal students' negative perceptions of collaborative learning.

Brown and McIlroy (2011) state, "the evidence seems to suggest that GLAs (Group Learning Activities) have the potential for being a negative learning experience" (p. 691). Colbeck et al. (2000) investigated conditions that contribute to positive and negative group learning and found that "many students had negative reactions to group learning experiences" (p. 61). In a study that compared student attitudes toward collaborative learning and sustainability, Gale et al. (2014) found that upper-division interior design students' attitudes were less positive than lower-division in the same major. Furthermore, "a simple Internet Google® search using the phrase 'hate group work' confirms that this is an issue students expend precious time and energy in exploring through blogs and other electronic postings" (Brown & McIlroy, 2011, p.687).

Research provides possible reasons for students' positive and negative perceptions of collaborative learning. Brown and McIlroy (2011) suggest that students learn to dislike group collaboration because of unequal workload, no control, poor communication, and conflicting schedules. Prior experiences also influence students' perceptions and interactions in project teams according to Colbeck et al. (2000). "Differences in their past experiences and in their goals for the future influenced students' immediate motivation for accomplishing design project tasks" (Colbeck et al., 2000, p. 71).

Conflict among group members is another factor that influences students' perceptions of collaborative learning. "Conflict over personal issues can have negative effects on group productivity and members' satisfaction" (Colbeck et al., 2000, p. 79). For example, conflict related to gender or ethnic differences resulted in negative group

experiences for some students (Colbeck et al., 2000). “A few even voiced the desire to avoid future group work” (Colbeck et al., 2000, p. 60). Summers and Svinicki (2007) suggest that students must trust group members and believe each member will make an effort within the cooperative learning experience; otherwise, the group will not successfully meet the learning task. Other students would simply prefer to work alone despite their ability to get along with other group members (Gottschall & García-Bayonas, 2008).

Instructor planning and guidance during collaborative learning also influences student perceptions. According to Colbeck et al. (2000), “the conditions for group learning in higher education settings rarely meet the standards advocated by cooperative learning scholars … many well-intentioned faculty assign group projects without providing students the information and guidance prescribed by cooperative learning advocates” (p. 61). As a result of poor instructor planning, students may have negative experiences with group learning. “Students were particularly frustrated when they believed that the instructor had poor group skills or shirked responsibility for helping the groups” (Colbeck et al., 2000, p. 61). Colbeck et al. also found that students did not receive specific guidance from faculty about how to work in groups. “There was a perception that GLAs were unfair and that the lecturer had abandoned them with little supervision and support” (Brown & McIlroy, 2011, p. 690). Summers et al. (2005) conclude that “poorly designed group learning can produce worse results than competitive approaches” (p. 168).

Fairness in shared group responsibilities is a common source of frustration for students when working collaboratively. Social loafing and ‘free riding’ are terms that describe students who avoid responsibility in a group, which results in more work for

other members. Students who feel "suckered" into doing the work often experience resentment (Brown & McIlroy, 2011). Fairness in grading can also be a source of frustration for students when sharing group responsibilities.

> From instructors, students wanted more structure and marks for individual contribution as opposed to a group mark … students' comments about the grading outcome reflect a greater concern with the grade itself and whether it was perceived as fair than with the material to be learned or the group task. (Brown & McIlroy, 2011, p.690)

However, Colbeck et al. (2000) suggest that students are not completely dependent on instructors for guidance when working in groups since students have developed insights from prior collaborative experiences. "A few students described how lessons learned from experiences in previous classes helped them approach problems and plan projects more effectively" (Colbeck et al., 2000, p. 69). More specifically, Colbeck et al. (2000) noted, "students reported that lessons learned from out-of-class and prior class group experiences shaped their goals, enhanced their leadership skills, alerted them to avoid slackers, and taught them how to divide tasks" (p. 77).

Research suggests that instructor perceptions of collaborative learning also vary. According to Smith (2011), it "seems safe to assume that cooperative learning (or something like it or based on it) has been embraced by higher education faculty" (p. T3E-4). Colbeck et al. (2002), however, state that lecture is still instructors' main instructional approach in higher education. "More than three-fourths of faculty rely on lecture as their primary teaching practice" (Colbeck et al., 2002, p. 1).

Some instructors subscribe to collaborative learning as an effective instructional approach and recognize its value. Gamson (1994), when reflecting on his first conference

about collaborative learning in 1983, states that he and others "were all starting from an intuitive sense that more student involvement, especially in groups, was essential to learning" (p. 45). Prosser and Trigwell (2014) suggest that instructors should adopt student-focused perspectives and instructional approaches that lead to deeper approaches to learning. "Group work is also considered by many instructors as a methodologically sound way of utilizing class time and a robust technique for students to interact and learn from each other" (Gottschall & García-Bayonas, 2008, para. 2).

Not all faculty perceive collaborative learning positively. "While some faculty have embraced active learning with enthusiasm, others remain more cautious" (Catalano & Catalano, 1999, p. 59). Walker (1996) found that instructors may perceive student groups negatively because they stereotype other instructors who use group work to lessen their workloads or avoid preparation. Other faculty, according to Catalano and Catalano (1999), question the rigor of learner-centered instructional approaches. "Some traditionalists still argue that the inclusion of many of the student-centered roles in the classroom will lead to a lessening of the academic rigor of the presentation" (Catalano & Catalano, 1999, p. 63). Summers et al. (2009) suggest that faculty may believe that autonomy support (giving students choice, control, and support) is a way to lose control in their classroom.

Prosser and Trigwell (2014) suggest that adopting learner-centered approaches and perspectives to teaching such as collaborative learning may depend on an instructors' "willingness to confront and change their conceptions and understanding of what constitute high-quality teaching and learning in higher education" (p. 794). However, instructors' perceptions of their teaching may not match what is really happening in their classroom.

> What people say they value/believe does not always transpire through their actions. It is possible that when given time to think about their pedagogical beliefs teachers tend to think about them through a student-centred lens, but in practice have a tendency towards more teacher-centred, content-oriented approaches. (Budge & Cowlishaw, 2012, p. 562)

Even instructors who do use collaborative learning and feel that it is useful may not base it on research-based evidence; instead, they use group work because they perceive it to be useful, think students benefit from it and like it, and want to incorporate variety into their courses (Gottschall & García-Bayonas, 2008, para. 42).

According to Prosser and Trigwell (1997), "if we are to improve the quality of teaching and learning in higher education we will need to take account of the perceptions teachers have of their teaching context" (p. 25). Furthermore, instructors' decision-making when using collaborative learning activities need to be grounded in research-based evidence.

Gender

The instructor

Several studies on gender differences suggest that teaching styles and practices, instructor characteristics, and student perceptions vary among male and female faculty (Basow, 2000; Basow, Codos, & Martin, 2013; Basow, Phelan, & Capotosto, 2006; Nelson Laird, Garver, & Niskodé-Dossett, 2011). Nelson Laird et al. suggest that women instructors utilize effective instructional practices more often than male faculty.

> Females were more likely than males to utilize motivation or process paradigms yet they were less likely to support a content-oriented paradigm…women were

> more likely than men to invest time planning their courses, designing learning activities, and assessing student learning. (Nelson Laird et al., 2011, p. 262)

Furthermore, Nelson Laird et al. found that female dominated fields such as education and nursing emphasize effective teaching practices more than male dominated fields even when controlling for gender. Female instructors are more likely to use discussion and encourage participation while male instructors are more likely to lecture (Basow et al., 2006; Nelson Laird et al., 2011). "Women were more likely to use a facilitator or delegator style that emphasizes relating to students as a guide, consultant, or resource as opposed to transmitting knowledge, setting goals, and providing feedback" (Nelson Laird et al., 2011, p. 262). However, Basow et al. (2006) posits that "…certain teaching styles and qualities may be differentially effective based on their own as well as their students' gender" (p. 34).

Student perceptions of instructors differ by the gender of the instructor. "Students' evaluations can be significantly influenced by the gender of their instructors. Many studies reveal that students tend to rate female faculty members' differently than male faculty members" (Nelson Laird et al., 2011, p. 262). Male faculty are often ranked higher than female instructors on scholarship/knowledge and dynamism/enthusiasm; female faculty are ranked higher on faculty-student interactions (Basow et al., 2013). Effective male instructors are described as delivering credible course content, and effective female instructors are described as relating well to students and providing a comfortable classroom environment (Basow et al., 2006). "Students perceived female instructors to be more sensitive and considerate of student ideas whereas male instructors were believed to be more knowledgeable" (Nelson Laird et al., 2011, p. 262).

Instructor characteristics are also related to students' perceptions of gender which Basow (2000) terms "gender-related teacher personality characteristics" (p. 414). "Male and female professors, but especially the latter, are viewed against a background of gendered expectations and appear to be judged using gendered standards" (Basow et al., 2006, p. 34). This is particularly true of male students' perceptions of female instructors.

> Although the approachable/accessible/helpful theme was often used to describe best professors in general, it was used significantly more for female professors than male professors, mainly by male students. In fact, nearly one out of four male students described their best female professors this way. (Basow et al., 2006, p. 32)

Furthermore, in the study by Basow et al. (2006), male students often described best female instructors according to faculty-student interactions. "Perhaps because female professors were expected to be strong in interpersonal qualities … and indeed did seem to be rated highly on these interactions by everyone in this study and in others" (Basow et al., 2006, p. 32).

On the other hand, male instructors are often rated the same by both male and female students while female instructors are rated lower by male students and sometimes higher by female students (Basow et al., 2013). Basow et al. (2006) explains this difference by suggesting that "…people show prejudice toward individuals (e.g., women) whose stereotypic characteristics (e.g., nurturant) do not match those of the social roles they inhabit (such as a competent and knowledgeable professional) … people tend to use different standards in judging men and women" (p. 25). However, Basow (2000) also concluded that, regardless of gender, "interpersonal traits appear to be particularly

important … since the single most utilized descriptor, by about half of all students, is caring" (p. 414).

Student experiences in the classroom

Gender is an important factor that influences students' experiences in the classroom community. "In the context of a college classroom, social status can include the gender, race, age, and social class of the students and the instructor" (Hirschy & Wilson, 2002, p. 87). Weaver and Qi (2005) suggest that the climate of classrooms in higher education often favor men, and therefore men are more likely to participate. Atkinson, Buck, and Hunt (2009) support that gender bias is common in college classrooms: "behaviors such as calling on male students more often, using male generic pronouns, and failing to acknowledge women's contributions" (p. 235) all suggest that students' classroom experiences may favor the normative group, White men. Cress (2008) states that "even after two decades of attention to such issues, it appears that faculty continue to interact with female students quite differently than they do with male students" (p. 101).

The "chilly climate" phenomenon, prevalent in the 1990s and termed by Bernice Sandler in 1984, refers to the discrimination women face on campuses. This phenomenon may explain why women have been treated as "second-class citizens" in several college communities (Hirschy & Wilson, 2002). "Male-normed classrooms … have generally been described in the literature as competitive, weed-out systems that are hierarchically structured with impersonal professors" (Vogt, Hocevar, & Hagedorn, 2007, p. 339). According to Polnick, Ritter, & Fink (2011), female students traditionally learn best in classroom environments where people are accepted and feel that they belong. Basow et al. (2013) note that female students must work harder than male students in order to be

perceived as equally capable; women also ‘fall from grace’ easier than men. If the educational system is considered hierarchical and competitive, and female students learn best when they feel accepted, the college classroom may cause self-doubt in women (Vogt et al., 2007).

Studies also suggest that gender differences are related to communication pattern differences (Rovia, 2002b). Higher education “favors ‘masculine’ forms of communication” (Weaver & Qi, 2005, p. 578) where “help-seeking may be perceived as academic weakness” (Vogt et al., 2007, p. 342). Whereas women often use language to create connections and build consensus, male communication is more independent and autonomous (Graff, 2003; Weaver & Qi, 2005).

According to Cress (2008), “campuses are struggling with how to make their educational environments hospitable settings for a wide variety of learners” (p. 95). Perhaps faculty are a significant part of the solution to change gender discrimination in higher education. According to Vogt et al. (2007), “supportive faculty had a positive relationship with women’s development of self-efficacy in mathematics-related subjects” (p. 340). Furthermore, when students perceive gender equity from their instructor, students feel a higher level of responsibility for their own learning (Hirschy & Wilson, 2002). Simply having a female professor “encourages female students to participate more and increases their confidence, comprehension, and interest in the subject” (Atkinson et al., 2009, pp. 239-240).

Another approach to combatting gender discrimination in higher education is to focus on creating equitable environments where positive classroom community is encouraged. For example, “collaborative learning is highly recommended as a method of inviting all students to actively participate in the learning process” (Summers, Beretvas,

Svinicki, & Gorin, 2005, p. 167). In an equitable environment, both male and female students have access to opportunities where they can contribute, learn, and grow within a safe classroom community.

> The inclusion of multiple classroom community elements may be an effective way to equalize potential gender differences … by building and sustaining a sense of classroom community, course designers and instructors can eliminate potential inequities in the way males and females may perceive their levels of learning and connectedness in both online and face-to-face classes. (Polnick et al., 2011, p. 322)

Community

Definition of Community

McMillan (1996), the scholar who developed the Sense of Community (SoC) theory with Chavis in 1986, provides the following definition of sense of community,

> I view Sense of Community as a spirit of belonging together, a feeling that there is an authority structure that can be trusted, an awareness that trade, and mutual benefit come from being together, and a spirit that comes from shared experiences that are preserved as art. (p. 315)

In a learning environment, this shared and emotional sense of connectedness occurs when students experience belonging or personal relatedness in a community (McMillan, 1996). Furthermore, "because faculty-student and peer interactions influence many college effects on students, the college classroom is a logical focal point" (Hirschy & Wilson, 2002, p.86).

Summers et al. (2009) define classroom community as "a sense of social belongingness in classrooms" (p. 294). Ciani, Middleton, Summers, and Sheldon (2010)

provide a similar definition that includes membership, “classroom community is defined as the degree to which students feel like they are members of their classroom” (p. 89). Rovai (2002b) suggests that classroom community not only includes emotional connectedness, but should also consider common learning goals and expectations. Therefore, group members within a classroom community who feel connectedness have a level of care and contentment among group members; learning takes place when an active and social construction of knowledge occurs from a learning community that is thriving (Wendt & Rockinson-Szapkiw, 2015). “A classroom community can therefore be viewed as a social community of learners who share knowledge, values, and goals” (Rovai, 2002b, p. 322).

Background

Classroom climate has been a topic of interest in educational research since the late 1930s (McKinney, McKinney, Franiuk, & Schweitzer, 2006). Researchers have studied both school climate and classroom climate in order to determine its effect on student learning. Much of the research historically, however, has centered on elementary and secondary classrooms (New Detroit: The Coalition, 2003). Recently, more research has explored classroom community in higher education particularly because of the increasing focus on online education including “asynchronous learning network” (Rovai, 2001) and hybrid courses.

The earliest mention of sense of community, according to Chavis and Pretty (1999), was in 1974 by Seymour Sarason. ‘Psychological sense of community’ was emphasized as an important construct in community psychology, which, at the time, focused on communities and neighborhoods (Chavis & Pretty, 1999). The theory of sense of community was developed throughout the 1980s and 1990s, although it was

considered a difficult construct to measure. McMillan and Chavis (1986) developed the Sense of Community (SoC) theory, and it was widely accepted as a credible theory in which to consider community as a construct.

Sense of Community Theory

Chavis and Pretty (1999) stated, "researchers' constructions of their own community experience orient their hypotheses, methods, and interpretations of a community's responses. Hence we do not find a strict consensus regarding the definition, model, or method for researching a SOC" (p. 636). They agreed, however, that McMillan and Chavis (1986) were developing a theory to consider.

The Sense of Community (SoC) theory, hypothesized by McMillan and Chavis in 1986, included four elements of psychological sense of community: membership, influence, integration, and fulfillment of needs, and shared emotional connection. In 1996, McMillan revised the SoC theory and determined seven elements of sense of community: spirit, emotional safety, boundaries, sense of belonging, trust, trade, and art.

Spirit, originally called membership, is "the spark of friendship that becomes the Spirit of Sense of Community" (McMillan, 1996, p. 315). McMillan believes that each individual needs to feel connected with other people in order to have a place and a community to express his or her personality.

Emotional safety occurs when it is safe for each individual to tell "The Truth". "The Truth is a person's statement about his or her own internal experience" (McMillan, 1996, p. 316). McMillan suggests that there cannot be a sense of community if there is no Truth. Making it safe to tell The Truth is the first task of a community and requires empathy, understanding, and caring (McMillan, 1996).

The next element of SoC theory, boundaries, allows emotional safety and identifies the time and setting for a group (McMillan, 1996). Boundaries can protect members from fear because boundaries can determine which members are 'one of us' (McMillan, 1996, p. 317).

The fourth element of SoC theory, Sense of Belonging, is the individual's belief, or faith, that he or she belongs. According to McMillan (1996),

> Acting on such faith represents a risk and requires courage since humiliation can result if the faith is not validated. In essence, people bond with those whom they believe want and welcome them … when we believe that we will be welcome, that we fit or belong in a community, we have a stronger attraction to that community. (p. 317)

Each member has a right to belong, but it is also the responsibility of the community to accept each member. However, being a member of a community includes "paying dues" (McMillan, 1996). Just as these dues provide a member with a certain amount of entitlement, paying dues also allows the community to expect sacrifices from the member.

McMillan (1996) suggests that the element of trust is the most important factor in producing intimacy. Trust allows people to feel more connected when they can determine what to expect from each other.

> A community must be able to influence its members and members must be able to influence the community. To be effective, a community must have these influences flowing concurrently to create a sphere of influence. The salient element of influence is the development of trust. (McMillan, 1996, p. 318)

The next element of SoC theory is trade. According to McMillan (1996), "if people associate together, then it must be reinforcing to do so" (p. 320). Trade implies that if members possess differences, they will desire to make bargains with each other based on the needs and resources each individual brings to the community. If a community can incorporate members' resources and meet members' needs, the community will build unity and coherence (McMillan, 1996).

The last element of the SoC theory is art. Art results when the other elements come together to "create a shared history that becomes the community's story symbolized in ART … the basic foundation of art is experience" (McMillan, 1996, p. 322). Art requires quality contact among members; this leads to "shared emotional connection" (McMillan, 1996, p. 322). The stories that result from contact become art.

Benefits of Community

Since higher education is shifting towards learner-centered approaches to teaching and learning, considering ways that sense of community can enhance the learning environment becomes an important discussion. Velasquez et al. (2011) recall that for over a decade scholars have stressed the importance of pedagogies that improve student engagement and build a sense of community in higher education. Furthermore, "higher education research suggests that the development of a sense of belonging is key to academic success and persistence" (Vaccaro et al., 2015, p. 670). D'Andrea and Gosling (2005) support this notion: "institutions need to have multiple strategies for maximizing students' sense of belonging" (p. 101).

Colleges and universities benefit from creating a sense of community. Several studies have suggested that sense of community has a positive influence on retention rates (Ashar & Skenes, 1993; Bruce & Stellern, 2005; McInnerney & Roberts, 2004;

Rovai, 2002a; Rovai, 2002b; Rovai & Wighting, 2005; Tinto, 1997). When students have a sense of belonging, they feel less isolated. According to Rovai and Wighting (2005), "the underlying issue of alienation is essentially lack of a sense of belonging" (p. 105). They go on to say that low sense of community and feelings of alienation contribute to student attrition in higher education. Therefore, the more students are involved and integrated into the community of the college, the greater the chance that they will persist (Tinto, 1997). Rovai (2002b) notes that creating community attracts students and retains learners since sense of community reduces the amount of students who dropout if they are more satisfied and feel involved in the learning community. Rovai and Wighting (2005) also suggest that student retention is not only connected to a student's experience at the institution, but specifically connected to the quality of a student's classroom experience.

Perhaps the most significant benefit regarding sense of community found in research is the connection sense of community has with increased student academic achievement and motivation (Dawson, 2006; Freeman et al., 2007; Hirschy & Wilson, 2002; Rovai, 2002b; Summers & Svinicki, 2007; Tinto, 1997; Velasquez et al., 2011; Wendt & Rockinson-Szapkiw, 2015). According to Summers and Svinicki (2007), creating community plays "an integral role in the advancement of student learning" (p. 57). Velasquez et al. (2011) state "that college and university students who are engaged in class and have a sense of belonging to a classroom community perform better, enjoy their university experiences more, and are more likely to remain in college" (p. 97). Rovai (2002b) notes that increasing feelings of community will increase students' motivation to learn and draw upon other learners who can support their learning. Other

benefits of sense of community related to academic achievement and motivation include improved participation, attentiveness, and attendance (Velasquez et al., 2011).

Hirschy and Wilson (2002) suggest that when instructors consider "how social factors affect the teaching and learning exchange between faculty and students and among peers in a classroom it enables educators to address structural inequities and promote learning for students of varying backgrounds" (p. 85). Therefore, when an instructor creates community in the classroom, all students benefit. "Learning is the feeling that the community actively worked together to construct meaning and understanding of the course content. The learning was enhanced due to the work of the members of the community" (Ritter et al., 2010, p. 96). Rovai (2002b) also notes that feelings of community among students increase cooperation, a commitment to group goals, and satisfaction with group efforts.

There are also socioemotional benefits to classroom community. Talò, Mannarini, and Rochira, (2014) state, "SoC signifies a healthy community and exhibits and extra-individual quality of emotional interconnectedness observed in collective lives" (p. 2). When an individual builds a sense of unity and becomes inclusive, members of the community can be vulnerable and feel safe to express their ideas even if they disagree with others (Ritter et al., 2010). Rovai and Wighting (2005) suggest several benefits to sense of community:

> They are better adjusted, feel supported, have connections to others and to goals that maybe above their own limited aspirations, and have stronger levels of social support and social connectedness. Consequently, a strong sense of community acts as a buffer against threats, provides a place in which individuals are free to

express their identities, and helps them deal with changes and difficulties in society at large. (pp. 99-100)

Elements of Sense of Community

According to Rovai and Wighting (2005), the construct of classroom community includes learning community and social community. Learning community occurs when there is an active construction of knowledge among members of the community. Members of the learning community have shared values and educational goals, which are satisfied by group membership (Rovai & Wighting, 2005). Social community, on the other hand, "represents the feelings of the community of students regarding their spirit, cohesion, trust, safety, interaction, interdependence, and sense of belonging" (Rovai & Wighting, 2005, p. 101).

"Learning has important social and cognitive dimensions and occurs most effectively when there is a strong sense of community" (Rovai & Wighting, 2005, p. 100). Interaction among members of a classroom community is associated with student satisfaction and a higher level of sense of community (Dawson, 2006). Also, students who are highly involved demonstrate greater learning gains (Tinto, 1997). Therefore, "approaches to learning that promote social constructivism, or learning within a social context, and that feature active group construction of knowledge, rather than transfer of knowledge, provide ideal learning environments" (Rovai & Wighting, 2005, p. 100). Learning community, therefore, forms when there is interaction among members as they actively construct knowledge together (Rovai, 2002b).

"Social acceptance is the foundation for a sense of belonging" (Vaccaro et al., 2015, p. 671). Social acceptance includes supportive relationships and perceived peer support (Vaccaro et al., 2015). McInnerney and Roberts (2004) suggest, "all humans

present themselves to others in a manner that will gain them acceptance within the community's norms" (p. 77). For example, if students' fear disapproval from peers, that fear will affect students' behavior in class (Weaver and Qi, 2005). Rovai and Wighting (2005) state, "sense of community provides a sense of belonging, identity, emotional connection, and wellbeing" (p. 99). Therefore, psychological safety and trust become essential elements to social community.

Connectedness is a central element to social community. Rovai (2002b) describes connectedness as "the feeling of belonging and acceptance and the creation of bonding relationships" (p. 322). McMillan (1996) suggests that all people need connections to others and settings where they can be themselves and express their individual personalities. Having connectedness involves membership in a community, which leads to relationships, unity, and satisfaction among learners (Rovai, 2002b). When individuals feel accepted as part of the community, they "feel safe to speak openly and their classroom community responds in supportive ways" (Ritter et al., 2010, p. 96).

In order to feel connected to members of a community, individuals must develop trust and a sense of safety. According to McInnerney and Roberts (2004), "the level of trust between all involved in the educational process has to be high if a sense of community is to develop" (p. 75). Through bonding and discovering similarities with each other, individuals can "find people with similar ways of looking, feeling, thinking, and being … where one can safely be oneself" (McMillan, 1996, p. 321). Ritter et al. (2010) suggests that safety is essential in order for students to be themselves and take risks in their learning. Healthy communities "protect their members from shame in their social exchanges" (McMillan, 1996, p. 322). When members feel protected, trust can produce intimacy and cohesion (McMillan, 1996).

Conditions that Support Sense of Community

Classroom learning environment

Hill (1996) states that "…sense of community is setting specific" (p. 435). Therefore, in order to support sense of community in the postsecondary classroom, the context of the learning environment must be considered. "The college classroom lies at the center of the educational activity structure of institutions of higher education; the educational encounters that occur therein are a major feature of a student's educational experience" (Tinto, 1997, p. 599). Membership in the classroom community may also connect members to communities outside of the classroom and becomes a gateway for students to be involved in both academic and social communities within the institution (Tinto, 1997). Therefore, reflecting upon the context of the environment becomes important within the discussion of SoC in the classroom.

Furthermore, "the classroom setting has the potential to become a site of community itself. As students and faculty develop relationships over time through interaction and common goals, social forces emerge that either facilitate or impede learning" (Hirschy & Wlson, 2002, p. 87). Shared experiences within the classroom support individuals being part of something important which contributes to a sense of community (McMillan, 1996). Therefore, the engagement and involvement of the members of the community it critical to its effectiveness within the classroom environment (Baker-Eveleth, Chung, Daniel, & O-Neill, 2011). Van den Bossche et al. (2008) provides support for the importance of the learning environment when discussing a framework for collaborative learning: "viewing collaborative learning as reaching mutually shared cognition, and thus as fundamentally social, stresses the need to take into account the social context in which these processes take place" (p. 497). Rovai and

Wighting (2005) concur that the best learning environment includes learning within a social context where students actively construct knowledge together rather than an environment where knowledge is simply transferred. The context of the classroom environment provides an important avenue to support student learning and academic achievement.

Van den Bossche et al. (2008) identified the following social conditions that support successful collaboration within the learning environment: psychological safety, cohesion, group potency, and interdependence. Psychological safety allows for individuals to take risks. According to Gitterman (2004), "creating a supportive and trusting psychological and social climate is even more important than the physical setting" (p. 102). Cohesion is a commitment of the group to achieve a goal or task which is required by the group's combined effort. Cohesion can lead to higher motivation (Van den Bossche et al., 2008). Group potency refers to the belief of the members that the group has the ability to be effective. Interdependence, "the extent to which team members' personal benefits and costs depend on successful goal attainment by other team members" (Van den Bossche et al., 2008, p. 501), leads to more effective and positive team collaboration. Psychological safety, interdependence, cohesion, and group potency, all influence learning behavior. Learning behavior affects mutually shared cognition and mutually shared cognition directly affects team effectiveness (Van den Bossche et al., 2008).

The instructor

According to Ritter et al. (2010), "establishing a healthy classroom community is the responsibility of all professors" (p. 96). The behavior and attitude of an instructor has a significant impact on the learning environment.

> The educational context created by faculty behaviors and attitudes has a dramatic effect on student learning and engagement. Institutions where faculty create an environment that emphasizes effective educational practices have students who are active participants in their learning and perceive greater gains from their undergraduate experience (Umbach & Wawrzynski, 2005, p. 183).

Instructors can influence the classroom environment by emphasizing a learning environment that values achievement, love of learning, collaboration, and caring (Hirschy & Wilson, 2002). Ritter et al. (2010) state, "…connectedness begins with professors having a positive attitude about the class. A positive attitude comes with a belief that all their students will be successful" (p. 96).

With an attitude that all students will be successful and sense of responsibility to establish a healthy sense of community, instructors must also be intentional about how they will create classroom community. "By anticipating and attending to the social forces that occur in the classroom, faculty better foster student learning and help students achieve their higher education goals" (Hirschy & Wilson, 2002, p. 97). Hirschy and Wilson (2002) suggest that student achievement will increase when instructors consider the following strategies that build classroom community:

> (a) demonstrate the process of a democratic classroom,
>
> (b) treat the students with respect,
>
> (c) provide a safe base for conversation,
>
> (d) model emotional support,
>
> (e) encourage real conversations,
>
> (f) encourage students to challenge themselves and each other, and
>
> (g) ask students to design meaningful and interesting tasks. (p. 95)

The instructor's interactions and relationships with students are an important part of promoting coherence in the classroom (Kember et al., 2007). "Communities and groups are more cohesive when leaders influence members and when members influence leaders concurrently" (McMillan, 1996, p. 319). A reciprocal relationship suggests that instructors must consider their role in the classroom community as leader and learner. "A facilitator who is always open to becoming a learner, especially in his or her own classroom setting, can become a more enthusiastic and effective educator" (Harris, 2001, p. 22).

Instructors must be aware of how they exercise their authority as it influences the classroom environment and student learning (Hirschy & Wilson, 2002). According to Robinson and Kakela (2006), instructors must demonstrate respect for students as individuals. Students who feel respected and trusted by the instructor will also respect and trust each other (Gitterman, 2004; Ritter et al., 2010). McKinney et al. (2006) note that one of the most important contributors to student success and satisfaction is a caring attitude of the instructor. In fact, when instructors express warmth and approachability, student incivility decreases (Summers et al., 2009). Summers et al. (2009) state that "students might behave more positively if their teachers care about them and how they learn" (p.293). Therefore, if students have a positive experience in the classroom, they may have a positive attitude toward the instructor (Summers et al., 2009). Weaver and Qi (2005) also support the importance of faculty-student relationships: "faculty members not only indirectly shape classroom dynamics but also directly influence students' behaviors in class through the relationship they develop with their students" (p. 591).

Furthermore, Weaver and Qi (2005), in their study about students' perceptions of classroom organization and participation, note that "faculty's expressed interest in the

students' intellectual development and learning likely engenders students' confidence in their own abilities and thereby encourages in-class participation" (p. 574). When incorporating collaboration and active learning among students, Robinson and Kakela (2006) suggest that instructors promote original thinking by encouraging students to share their knowledge, contribute to class discussions, and develop creative responses.

Instructor communication is also recognized as an important part of developing a sense of community in the classroom. "The educator has to create an effective learning environment by first learning how to communicate and socially interact with the students" (McInnerney & Roberts, 2004, p. 77). Immediacy, communication behaviors that support closeness to others, includes both verbal and nonverbal behaviors and can influence students' motivation. Frymier (1993) noted a "positive association between teachers' use of immediacy and students' reported motivation to study for the class" (p. 8). Therefore, instructors must be aware of their verbal and nonverbal communication as it affects students' learning.

Instructors, for example, must clearly communicate their expectations by using consistent guidelines (Ritter et al., 2010). Ritter et al. (2010) also suggests the following instructor nonverbal behaviors: "giving students sufficient wait time to answer questions, respecting their responses, and encouraging all students to succeed while, at the same time increasing their comfort level" (p. 97). Nonverbal behaviors may also involve proximity, standing close to students when speaking with them, and making appropriate eye contact (Ritter et al., 2010). Since verbal and nonverbal behaviors are important to healthy communication, instructors must also consider effective ways to support communication among students. Hirschy and Wilson (2002) suggest that "…an instructor's intervention may encourage a classroom climate that supports respectful

discourse among classmates and advances other effective learning conditions for diverse populations" (p. 94). Therefore, when instructors facilitate classroom discussion, they should implement verbal and nonverbal communication behaviors in ways that demonstrate respect and support learning.

Instructors play an important role in developing student relationships and coherent class groups (Kember et al., 2007) as well as planning and executing all parts of the design, management, and support when using group work assignments (Burdett, 2007). In the article entitled "Degrees of Separation – Balancing Intervention and Independence in Group Work Assignments," Burdett notes that instructors need to preplan and carefully design group work projects as well as clearly communicate with students the reasons for assigning the task, the objectives of the task, and the processes to be followed. Throughout group work, instructors need to provide support by guiding and facilitating the learning activity and developing student relationships with each other. If intervention is needed within a specific group, an intervention should occur within the early stages of group formation (Burdett, 2007).

Building relationships among students through interactive learning is an important part of creating community in a college classroom. Summers and Svinicki (2007) state that having "a feeling of belonging, where members matter to one another and the group" (p. 58), contributes to building community among students. However, according to Van den Bossche et al. (2006), "…relational issues such as competitiveness and friendships can hinder or stimulate the group, respectively, in dealing with the insights that are constructed in the group" (p. 493). Therefore, instructors should use effective and well implemented active learning methods, such as collaborative learning, that provide a context for students to interact with content and supports positive student relationships

(Summers et al., 2009). “Faculty who include collaborative and active learning strategies in their teaching, offer feedback to and interact with students, are clear and organized, and treat students equitably help mediate the negative effects of a competitive classroom climate” (Hirschy & Wilson, 2002, p. 90).

The student

Students and faculty have shared responsibilities for the social context and learning in the classroom (Hirschy & Wilson, 2002). Rovai (2002a) states, “learner-learner and learner-instructor ties have historically provided students with social, emotional, and academic support” (p. 206). Therefore, not only is the instructor a key player in building community in the classroom, students can also have a strong effect on sense of community.

Each individual brings various experiences to the classroom; therefore, peers can have a significant influence on classroom learning especially in classrooms that include group collaboration. “Many students experience a gap between their natural learning style and how material is presented in class” (Hirschy & Wilson, 2002, p. 91). However, student collaboration is a variable that has a positive effect on educational gains (Solimeno et al., 2008). Peer collaboration can support students’ learning and construction of knowledge since peers provide different approaches to learning and understanding. Not only does group work help students develop problem solving strategies and make cognitive gains, collaborative learning also increases students’ motivation and participation by creating opportunities for meaningful engagement (Burdett, 2007; Van den Bossche et al., 2006).

Ritter et al. (2010) state,

…building supportive peer groups and making new friends in the class increased

> the belief of class members that their participation in the class was important, thus increasing the class participation. Building a supportive peer group that provided both social and academic support for the students was essential. Making friends, who supported each other academically and in social situations outside the classroom, allowed the students to have a sense of personal involvement in the construction of their knowledge. (p. 97)

Furthermore, when students feel comfortable socially, they are less concerned with how competent they appear to their peers and can focus on learning (Ciani et al., 2010).

The level of involvement and participation of individuals influences classroom community. "Student traits (e.g., confidence) and class traits (e.g., supporting classmates) were better predictors of students' participation or silence than instructor traits, such as approachability, discussion style, and expertness" (Hirschy & Wilson, 2002, p. 93). Hirschy and Wilson (2002) suggest a number of factors that affect student participation such as class size, student confidence, student interaction, influence on grades, gender, and emotional climate of the class. More specifically, students may

> … be frustrated with domineering peers, fear appearing stupid, have low confidence levels, be shy, arrive unprepared, experience uncomfortable feelings about the topic, be sleep deprived, not understand the material in the manner in which it was presented, perceive that the professor does not really want discussion, or feel anxiety about being singled out as a model member of a group. (Hirschy & Wilson, 2002, pp. 93-94)

When individual students are not involved as members of the community, sense of community the can be jeopardized.

Positive peer interactions help shape and define the climate of the classroom and form a sense of belonging or connectedness that leads to classroom community. Several factors are important for students to experience connectedness among class members: "mutual respect, a shared responsibility for learning and mutual commitment to goals, effective communication and feedback, cooperation and a willingness to negotiate conflicts, and a sense of security in the classroom" (Hirschy & Wilson, 2002, p. 95). According to Rovai and Wighting (2005), in order to develop a level of intimacy where students trust and connect with each other, "individuals must set aside their preoccupations and concerns for their own identity and voice, and invite the voices of others" (Rovai & Wighting, 2005, p. 107). When students interact and participate in an environment that is safe and provides opportunities for meaningful engagement and collaboration, members of the classroom have a greater chance of experiencing a sense of community in the classroom.

Collaborative learning

According to Ciani et al. (2008), collaborative learning "is often praised as an instructional tool that teachers can use to promote classroom community" (p. 629). Interactive learning, Summers et al. (2009) suggests, positively correlates with classroom community since interaction with others offers an opportunity for those involved to experience not only an intellectual synergy, but a unique social synergy. "When a class is divided into groups, a new social context is created in which students have the opportunity to share individual cognitions with their peers and come to a conclusion based on the sum of those cognitions" (Summers et al., 2005, p. 168).

Furthermore, "through the interdependent process, many students feel a sense of community develop from cooperative learning activities. The positive peer relationships

promote a learning environment, which supports diverse student learning styles and develops intergroup (e.g., race or ethnicity) friendships" (Hirschy & Wilson, 2002, pp. 94-95). Through dialogue and a common social context, students have a setting to learn together and gain a sense of belonging within the classroom community. Therefore, collaborative learning is an effective instructional method that promotes interactive learning in the college classroom (Summers & Svinicki, 2007). "Collaborative learning (compared with no collaborative learning) predicted positive academic classroom community" (Summers et al., 2005, p. 165).

Students' positive attitudes toward classroom community are much higher in classes that use collaborative learning (Summers & Svinickik 2007). Therefore, instructors should be intentional about implementing collaborative learning activities that are meaningful and supporting students within learning groups. In order for collaborative learning to be effective, "a positive interdependence among students, an outcome to which everyone contributes, and a sense of commitment and responsibility to the group's preparation – for the learning process and product" (Perumal, 2008, p. 381) is essential.

Summers and Svinicki (2007) suggest instructors should not assume that students perceive classroom community when using cooperative learning. Furthermore, students' attitudes and perceptions within a collaborative learning context may also influence their attitudes and perceptions of classroom community. Instead, it is more important that students perceive that their groups are working effectively to meet determined goals.

Student and Instructor Perceptions of Community

McMillan (1996) suggested that "no one knows better than the speaker how the speaker feels. He or she is the final authority about his or her emotions" (p. 316). When considering sense of community, both instructors and students have their own set of

feelings and perspectives of the psychological environment in the classroom. Both perspectives are important for understanding the context of the classroom environment and the way perceptions can influence teaching and learning.

Student perceptions

Students' perceptions are frequently considered in studies regarding sense of community (Frymier, 1993; Summers & Svinicki, 2007; Weaver & Qi, 2005) since students' insights contribute to understanding teaching and learning in the classroom. Frymier (1993) even noted that "students were as accurate in assessing teachers' immediacy behaviors as were trained observers" (p. 5). Therefore, students' perceptions of the classroom community have an important contribution to understanding sense of community.

Weaver and Qi (2005) suggested that "students' perceptions of and experiences within the social organization of the classroom play a crucial role in shaping their participation in class" (p. 571). Student characteristics, such as age and gender, influence students' perceptions and participation in class (Weaver & Qi, 2005). "Students perceptions of the friendliness of their peers contributed to how often they were willing to speak in class" (Hirschy & Wilson, 2002, p. 93). Therefore, individual student characteristics as well as students' perception of their peers can impact students' involvement and perception of the classroom community.

Students' perceptions of the instructor have a large impact on their perceptions of learning and sense of community. Booker (2008) suggests that faculty have the most influence on students' sense of belonging in the classroom. According to Hirschy and Wilson (2002), students who reported the most beneficial class experiences were students who perceived high levels of faculty concern. Ritter et al. (2010) also support the

importance of students' perception of faculty concern: "professors in face-to-face classes create a sense of acceptance when they are positive and the students know that the professor is interested in them and believes in their success" (p. 97). Hirschy and Wilson found that the amount of academic effort students exert can also be influenced by students' perceptions of the instructor. "Student learning is also associated with the perception that faculty are devoted teachers, as evidenced by intellectually challenging classes and encouraging students to discuss their perspectives in class" (Hirschy & Wilson, 2002, p. 89).

Perhaps the most compelling findings from research highlight the connections between students' perceptions of classroom community and perceptions of learning and academic performance. Wendt and Rockinson-Szapkiw (2015) note that sense of community was determined to be the primary predictor of students' perceived learning. Velasquez et al. (2011) state, "both student perceptions of how much they learn in the course and actual performance in the course are positively correlated with an increased sense of community" (p. 98). When students perceive sense of community in the classroom, perceived learning and academic achievement increases.

Instructor perceptions

Few studies have focused on instructor perspectives of SoC in the college classroom. Kay et al. (2011) acknowledge the imbalance of research between instructor and students' perceptions about classroom community. Most of the focus on classroom community is on students' perceptions; "there is limited research, however, about instructors' perceptions of classroom community in postsecondary education" (Kay et al., 2011, p. 231). The research on instructor perceptions of SoC, particularly in face-to-face classrooms, is especially limited (Kay et al., 2011).

Deale and White (2012) studied instructor and students' perceptions of online learning communities in order to explore their views of online learning communities and determine their ideas for how to increase sense of community in hospitality education. They found that instructor and students' perceptions of learning were significantly different. Students believed that they learned more than their instructors believed they learned (Deale & White, 2012). However, when measuring the construct of "connectedness" within Rovai's (2002a) Classroom Community Scale (CCS), Deale and White found no significant difference among instructor and students' perceptions.

Kay et al. (2011) explored professors' perceptions of classroom community through a multiple case study of 16 award-winning professors. Through interviews, Kay et al. (2011) discovered four emerging themes in the data as they considered interactions between student, content, and the instructor: "(a) a community of practice perspective of learning, (b) the professor's strategies for engaging students with each other about content, (c) the usefulness of exposing students to alternative viewpoints, and (d) managing the dynamics of the social system" (p. 240). These four themes helped Kay et al. identify the instructors' beliefs about their role in creating classroom community. This led to the researchers forming an expanded definition of classroom community and a conceptual framework. The definition "illuminates the role of social interaction in relationship to student learning and, thus, with its inclusion of cognitive considerations, differentiates the construct of 'classroom community' from other community settings" (Kay et al., 2011, p. 242). The framework represents the triadic interactions in the classroom and "recognizes the affective, social/relational, and cognitive dimensions of classroom social interactions" (Kay et al., 2011, p. 242).

When instructors consider the context of their teaching, the learning experience, including teaching and learning, can improve. Furthermore, "their (faculty) actions, framed by pedagogical assumptions, shape the nature of classroom communities and influence the degree and manner in which students become involved in learning in and beyond those settings" (Tinto, 1997, p. 617). Therefore, considering instructors' perspectives is particularly important when thinking about how perception can influence instructors' actions. According to Prosser and Trigwell (1997), "if we are to improve the quality of teaching and learning in higher education we will need to take account of the perceptions teachers have of their teaching context" (p. 25).

Instruments to Measure Community

The Sense of Community Index (SCI), based on McMillan and Chavis's (1986) Sense of Community Theory, was created by Perkins, Florin, Rich, Wandersman, and Chavis (1990) and is a popular instrument to measure general SoC in various types of communities. Chavis and Pretty (1999) considered the SCI to be "the most used and broadly validated measure of SOC" (p. 637). Talò et al. (2014) suggest that although the SCI fits different multidimensional settings, the SCI does not correspond with the four-dimensional model of SoC theory created by McMillan and Chavis (1986). According to Dawson (2006),

> The sense of community experienced by an individual is also influenced by the specific social context of investigation (Hill, 1996). Consequently, while the SCI has been readily adopted in community studies (Long & Perkins, 2003) the idiosyncrasies of the education milieu (e.g. assessment practices, instructor characteristics, learning activities) results in the establishment of a social environment with unique extrinsic and intrinsic pressures. (p. 155)

Therefore, the SCI may not be the best measure of SoC in a college classroom.

Alfred P. Rovai, in 2002, developed and field-tested the Classroom Community Scale (CCS) with graduate students enrolled in online courses (Rovai, 2002a). The CCS provides an overall classroom community score and that includes "connectedness" and "learning" as two subscales and provides a better measure of community in the unique setting of the college classroom (Rovai, 2002a). The construct of "connectedness" involves students' feelings of cohesion, spirit, trust, and interdependence (Rovai, 2002a). "Learning" is the construct that includes students' feelings as they interact with each other, construct meaning together, and "share values and beliefs concerning the extent to which their educational goals and expectations are being satisfied" (Rovai, 2002a, p. 207).

Although Rovai (2002a) developed the CCS with graduate students in online courses, the instrument can also be administered to undergraduate students in traditional face-to-face classrooms. "The test instrument was not constructed to limit its use to a distance education population" (Rovai, 2002a, p. 208). Several researchers have used the Classroom Community Scale since its creation (Barczyk & Duncan, 2013; Chen & Chiou, 2014; Dawson, 2006; Deale & White, 2012; Rovai, Gallien, & Louis, 2005; Rovai, Gallien, & Wighting, 2005; Rovai, Wighting, & Lucking, 2004). Rovai (2002a) argues that

> armed with an effective tool to measure community in a learning environment, educational researchers will be better equipped to conduct research on how best to design and deliver instruction at a distance in order to promote community and, by implication, to promote satisfaction and persistence among students. (p. 198)

The Postsecondary Instructional Practices Survey (PIPS) was designed by researchers at Western Michigan University to determine and measure instructional practices used by postsecondary instructors (Walter, Beach, Henderson, & Williams, 2014). Walter et al. (2014) created the PIPS to be used for all undergraduate disciplines and available to users on a non-proprietary basis. "Any postsecondary instructor from any discipline can be surveyed with the PIPS, including full- and part-time instructors, graduate students, and instructional staff" (Walter et al., 2014, p. 4). The PIPS was also designed to be easy to administer and score. "The PIPS is valid, reliable, easy-to-score, and can quickly collect data from a large number of participants" (Walter et al., 2014, p. 10).

Problem Statement

Since Boyer's (1990) landmark report, interest in creating community in classrooms in higher education has increased. However, much of the research focuses on student perceptions of sense of community, and according to Summers et al. (2005), several of the studies have been qualitative in nature. Furthermore, many of these studies involve on-line classes (Dawson, 2006; McInnerny & Roberst, 2004; Rovia, 2002a; Rovia, 2002b; Rovai & Wighting, 2005; Ritter, Polnick, Fink, & Oescher, 2010). Although there is growing research and interest in classroom community in higher education, there are still gaps. Therefore, further quantitative research on the relationship between instructor perceptions and student perceptions of sense of community may be beneficial to both educators and researchers.

Chapter II Summary

Several factors influence student and instructor experiences in postsecondary traditional classrooms and contribute to either a positive or negative learning environment. Considering factors such as learner-centered instruction, collaborative learning, perceptions of gender, and SoC can lead to a successful and positive classroom community. This study explored both student and instructor perceptions of SoC in a postsecondary traditional classroom and contributes to the literature related to classroom community in higher education. "In order for students to have opportunities to build or experience community, college and university instructors must be willing to consider the utility of classroom community as an instructional variable" (Kay et al., 2011, p. 231). Therefore, the purpose of the present study was to gain understanding of instructor and student perceptions of SoC, and whether they align or misalign. This knowledge may help educators better understand classroom community and the relationship between student and instructors' perceptions of SoC, which may provide insight into effective teaching and learning in higher education and improve SoC in the postsecondary traditional classroom.

CHAPTER III

METHOD

This chapter will outline the research design and methods that have driven this study and include details about the population and sample, instrumentation, data collection procedures, and analysis. The purpose of this study was to examine instructor and student perceptions of SoC in the traditional postsecondary classroom. More specifically, this study focused on whether there was an alignment between instructor and student perceptions of SoC and whether that alignment or misalignment influenced students' perceptions of SoC and their learning. Other variables such as instructional methods, student characteristics (gender, class level, repeat instructor, campus living), and instructor characteristics (gender, years teaching, discipline) were also considered as predictor variables on the outcome variable, student perceptions of SoC. In this study, SoC is defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis, 1986, p. 9).

The following questions have guided this study:

1. To what extent is there a difference between instructor and student perceptions of sense of community?
2. What is the influence, if any, of student characteristics (gender, class level, repeat instructor, campus living) on students' perceptions of SoC?
3. What is the influence, if any, of instructor characteristics (gender, years teaching, discipline) on students' perceptions of SoC?
4. What is the influence, if any, of instructional methods on students' perceptions of SoC?

5. To what extent, if any, do instructor perceptions of SoC influence students' perceptions of SoC?

Research Design

This study used a quantitative, non-experimental research design. A non-experimental design was appropriate since the purpose of this research was to study relationships among variables in actual practices (Creswell, 2009) rather than specific interventions or cause and effect. Furthermore, student and instructor questionnaires were used since they provide an effective approach to study the characteristics of a specific population and to measure perceptions. "There are … numerous facts about the behaviors and situations of people that can be obtained only by asking a sample of people about themselves" (Fowler, 2009, p. 2). A questionnaire also provided a standard collection approach to ensure uniform data from participants. Since this design was cross-sectional, data were collected at one point in time with online questionnaires. The questionnaire is an effective way to "generalize from a sample to a population so that inferences can be made about some characteristic, attitude, or behavior of this population" (Creswell, 2009, p. 146). This approach was used because the sample was accessible, the data could be collected quickly, and I was able to limit attrition since I visited classrooms to invite participants to complete the online questionnaires. Data from the student and instructor questionnaires were analyzed in order to better understand student and instructor characteristics on students' perceptions of SoC in postsecondary traditional classrooms. Conclusions have been drawn regarding factors that impact students' perceptions of SoC including instructors' instructional practices, student and instructor characteristics, and instructors' perceptions of SoC.

Population, Sample, and Site

This study focused on instructors and undergraduate students from postsecondary traditional classes in colleges and universities in a Midwestern state. The nonprobability sample included 36 classes taught by 36 full-time instructors with various years of experience. Each course was taught by one instructor and had a minimum of 20 students enrolled. Three institutions were included in this study; two were small private Christian liberal arts institutions, and the third was a large public university. Face-to-face courses that met the entire semester were selected from each institution. This clustering procedure was the best approach for sampling since I determined clusters (classes at each institution) and sampled within them; this approach linked students to their instructor. Stratification ensured that specific characteristics of students and instructors (gender, class level, repeat instructor, campus living, discipline, and years teaching) were represented so that "the sample reflects the true proportion in the population of individuals" (Creswell, 2009, p. 148). Participants involved in the study represented the population being studied – male and female instructors who taught undergraduate traditional courses as well as underclassmen and upperclassmen students from schools in a Midwestern state.

Since the online questionnaires were offered to participants in person, the courses selected for this study were purposefully selected from institutions geographically accessible to me. Furthermore, the instructors invited to participate were individuals I had connections with through networking. Instructors were invited to participate on a voluntary basis. Emails were sent to instructors from the three selected institutions in order to request their participation (see Appendix A). Data were collected throughout the middle and end of the spring 2017 semester. I anticipated that some of the online questionnaires would be incomplete and that some individuals would not agree to

participate in the study, so the size of the sample was larger than the minimum size required. "To have adequate power (i.e., .90) to detect cross-level interactions (i.e., level-2 slope relationships), a sample of 30 groups with 30 individuals is necessary" (Hofmann, 1997, p. 740). The number of students in each class may be fewer than 30, however. According to Hofmann (1997), "with regard to level-2 effects, more power is gained by increasing the number of groups as opposed to the number of individuals per group, whereas the power of level 1 effects depends more on the total sample size" (p. 740). Therefore, I invited 45 instructors with a minimum of 20 or more students in each class to participate in the study.

Instrumentation

I used two questionnaires for this study: the Classroom Community Scale (CCS) and the Postsecondary Instructional Practices Survey (PIPS). The CCS was used to measure student and instructor perceptions of community in the classroom. The PIPS was included in the instructors' questionnaire and collected data on instructors' self-reported teaching practices.

The Classroom Community Scale (CCS) was developed by Rovai (2002a) and was administered to students. An instructor's version of Rovai's CCS, modified by Deale and White (2012), was remodified by me and administered to instructors. Permission to use the instruments was provided from Rovai and Deale and White (see Appendix B).

The CCS includes 20 questions, each rated on a five-point scale (from Strongly Disagree = 0 to Strongly Agree = 4) and provides an overall classroom community score including two subscales: "connectedness" and "learning" (Rovai, 2002a). Items associated with "connectedness" include: "I feel connected to others in this course" and

"I feel that I can rely on others in this course"; items associated with the "learning" construct include: "I feel that I receive timely feedback" and "I feel that I am given ample opportunities to learn". Appendix C includes the CCS items for the students' questionnaire. Appendix D includes items for the remodified instructors' questionnaire. Raw scores were computed for "connectedness" and "learning" by calculating the scores for the ten items in each subscale. High scores calculated by adding points for all 20 items indicated a stronger sense of community. Along with the questions, the questionnaire also included a section that invited participants' comments. The comments section provided instructors and students an opportunity to explain or elaborate on any of their answers. Additional insight from participants contributed to my evaluation of the data.

The CCS was developed and field-tested by Alfred P. Rovai in 2002 with graduate students enrolled in online courses to determine its validity and reliability. Rovai (2002a) found the CCS

> to be a valid measure of classroom community and both the overall scale and its two subscales possess high internal consistencies. These high reliability coefficients provide evidence that although the scale is multidimensional, being composed of the connectedness and learning subscales, the items nonetheless reflect, at a more general level, the overall classroom community construct. (p. 207)

Rovai (2002a) calculated two internal consistency estimates, which indicated excellent reliability. Cronbach's coefficient α for the entire Classroom Community Scale was .92, and the split-half coefficient estimated by the Spearman-Brown prophecy formula was .91. Furthermore, "Cronbach's coefficient α and the equal-length split-half coefficient for

the connectedness subscale were .92 each … Cronbach's coefficient α for the learning subscale was .87 and the equal-length split-half coefficient was .80" (Rovai, 2002a, p. 206). Rovai's (2002a) instrument also revealed high content and construct validities. "Classroom Community Scale items have a Flesch Reading Ease score of 68.4" (Rovai, 2002a, p. 205). Most standard documents score 60 to 70, which shows that the Classroom Community Scale items have a high score and is, therefore, easier to understand (Rovai, 2002a). The validity and reliability of the instrument is also confirmed by educational researchers who have continued to use it since its development (Barczyk & Duncan, 2013; Chen & Chiou, 2014; Dawson, 2006; Deale & White, 2012; Rovai et al., 2005; Rovai et al., 2004).

Deale and White's (2012) questionnaire was modified from Rovai's (2002a) CCS for a study they conducted focusing on hospitality education students' and instructors' perceptions of sense of community in online classes. In their study, Rovai's original CCS was administered to students; "a modified version of the CCS was created and used for instructors to capture their perceptions of classroom community in the online environment" (Deale & White, 2012, p. 7). Table 1 includes Rovai's original scale items and Deale and White's modified scale items. I remodified Deale and White's (2012) scale items for the purpose of clarity. For example, instead of stating "I feel that students feel that I encourage them to ask questions," the item states, "students feel encouraged to ask questions." Table 2 includes Deale and White's modified scale items and my remodified scale items. To the best of my knowledge, the modified CCS instrument lacks validity and reliability information.

Table 1

Original Classroom Community Scale Items and Deale and White's Modified Scale Items

Rovai Original Scale Items (for students)	Deale & White Modified Scale Items (for instructors)
I feel that I am encouraged to ask questions.	I feel that students feel that I encourage them to ask questions.
I feel connected to others in this course.	I feel that students feel connected to others in this course.
I feel it is hard to get help when I have a question.	I feel that students feel it is hard to get help when they have a question.
I feel that I receive timely feedback.	I believe that students feel that I give timely feedback.
I feel that other students do not help me learn.	I feel that students feel that they do not help other students learn.
I feel that I am given ample opportunities to learn.	I feel that students feel they are given ample opportunities to learn.
I feel that my educational needs are not being met.	I feel that my students feel that their educational needs are not being met.

Note. Reproduced from "Hospitality Students' and Instructors' Perceptions of a Sense of Community and Learning in Online Classes: Do they see eye to eye?," by C. S. Deale and B. J. White, 2012, Journal of Hospitality & Tourism Education, 24(2/3), p. 7. Copyright 2016 by Deale and White

Table 2

Deale and White's Modified Classroom Community Scale and Remodified Scale Items

Deale and White Scale Items (for instructors)	Remodified Scale Items (for instructors)
I feel that students feel that I encourage them to ask questions.	I feel that students are encouraged to ask questions.
I feel that students feel connected to others in this course.	I feel students are connected to others in this course.
I feel that students feel it is hard to get help when they have a question.	I feel it is hard for students to get help when they have a question.
I believe that students feel that I give timely feedback.	I feel I give timely feedback.

Table 2 – continued

Deale and White Scale Items (for instructors)	Remodified Scale Items (for instructors)
I feel that students feel that they do not help other students learn.	I feel that students do not help each other learn.
I feel that students feel they are given	I feel that students are given ample

ample opportunities to learn.	opportunities to learn.
I feel that my students feel that their educational needs are not being met.	I feel that my students' educational needs are not being met.

Note. Reproduced from "Hospitality Students' and Instructors' Perceptions of a Sense of Community and Learning in Online Classes: Do they see eye to eye?," by C. S. Deale and B. J. White, 2012, Journal of Hospitality & Tourism Education, 24(2/3), p. 7. Copyright 2016 by Deale and White

The Postsecondary Instructional Practices Survey (PIPS), a 24 item survey measured on a 5-point Likert-style scale, was included within the instructors' questionnaire in order to measure instructors' perceptions of their teaching practices. The PIPS was created by researchers at Western Michigan University (Walter et al., 2014) and designed for instructors, including full and part-time faculty and graduate students, who teach in postsecondary institutions. The PIPS includes two broad categories, 'instructor-centered practice' and 'student-centered practice,' and generates five constructs within those categories.

> The 'instructor-centered practice' category includes eight items in two constructs: Instructor-student interactions (4 items) and summative assessment (4 items). The 'student-centered practice' category includes 16 items in 3 constructs: Student-student interactions (6 items), student-content interactions (5 items), and formative assessment (5 items). Each item is scored on a frequency style scale from 0 (not at all descriptive of my teaching) to 4 (very descriptive of my teaching). (Walter, Beach, Henderson, & Williams, 2014, p. 2)

Each construct is given a score between 0 and 100 which is a proportion-based value. A score of zero indicates 'not descriptive of my teaching', and a score of 100 indicates 'very descriptive of my teaching'. "To calculate a construct score, add scores from each

of its items, divide by the maximum score for the construct, and multiply by 100" (Walter et al., 2014, p. 8).

Reliability for the overall PIPS was assessed by calculating a Cronbach's alpha ($\alpha = 0.806$) which value suggests that the scales of measurement have acceptable internal consistency. Content and face validity was attained through a field test with "a sample of non-participating instructors (N=5) and a panel of education researchers at another institution (N=4). This process allowed for items to be revised for clarity, accuracy of content, and relevancy" (Walter et al., 2014, p. 10). Construct validity was determined through the 2-factor (2F) and 5-factor (5F) models that are consistent with learning theory and assessment practices.

Data Collection Procedures

Human Subjects Institutional Review Boards from each institution approved this study before it began (Appendix E). Participants' identifying information was securely held in private files, and emails that contained the URL to the online questionnaire were not associated with participants' responses or as any part of the data set. When data were collected and stored on the SelectSurvey.NET server; it was exported to the Statistical Package for the Social Sciences (SPSS), Version 24.0, and HLM 7.03 for Windows for statistical analysis. Data were securely stored in these programs on a protected computer that required a password.

A pilot study was conducted in October 2016 to assess the protocol of the study and identify potential logistical problems. I ran the pilot study at my institution with three experienced instructors (one male and two female) and the students in their traditional undergraduate courses. The questionnaires were distributed as hard copies to

all participants. After considering the potential challenges of data entry from over 30 classes with approximately 30 students per class, I decided to create the questionnaires online since survey software programs collect and organize data entered by participants. However, using an online questionnaire meant that all participants needed access to a technological device and the internet. This was a correct assumption since very few students did not have a technological device, and all classes had access to the internet. Instructors indicated that their questionnaire took between 15 and 20 minutes. Students finished their questionnaires in approximately 10 minutes. I also discovered that when the questionnaire was distributed at the end of class, fewer students left comments compared to participants who completed the questionnaire at the beginning of class. Perhaps students who took the questionnaire at the end may have been more interested in leaving class than spending additional time to comment. Therefore, when scheduling classroom visits with the 36 instructors for the full-scale study, I requested coming at the beginning of class.

The questionnaires were created online using SelectSurvey.NET so participants could use phones or other technological devices when participating in the study. The questionnaires were distributed and administered during the last three weeks of the spring 2017 semester. Since the purpose of this study was to examine perceptions of community, surveying participants during the end of the semester when they had time to build community was most logical. The informed consent form (see Appendix F) was provided to every instructor and student invited to participate in the study. Each participant's questionnaire was set up and specifically coded according to their institution, class, and instructor and was securely contained in SecureSurvey.NET.

I emailed 45 instructors to invite them to participate in the study; 36 instructors agreed to participate which included completing the online questionnaire and allowing me to come to their classes and invite their students to participate. I requested 15 minutes of class time to explain the study and administer the online questionnaires to students. The remodified CCS and PIPS contained a link that was included in each instructor's email so they could complete the questionnaire before I came to administer the CCS to their students during class. If instructors did not complete the questionnaires before I came to their class, I emailed them afterwards to thank them for letting me come and reminded them to complete the questionnaire at their convenience.

Students were given 10 minutes during class to complete the questionnaire. When I arrived to each classroom, I handed out the informed consent form, introduced myself, and explained that the students were invited to participate on a voluntary basis. If they did choose to participate, they could opt out at any time. I followed a class script that also reviewed the purpose of the study and instructions for participation (see Appendix G). According to Fowler (2009), the researcher should "make sure respondents know their help is important and how it will be useful" (p. 56). Therefore, when I explained the study I emphasized that the findings could help improve teaching and learning in higher education. Instructors and students provided consent by indicating yes on the first question that asked whether they agreed to participate. When students took the questionnaire, I was available in the classroom to answer any questions about the study or the questions on the questionnaire. By making myself available, students had a greater chance to provide accurate and honest answers. Instructors were asked to leave the classroom while students completed the questionnaire so they felt comfortable answering questions honestly without the instructor's presence in the room.

Data Analysis Plan

The analysis for this study relied on several methods, and data were analyzed using the Statistical Package for Social Science (SPSS) and Hierarchical Linear Modeling (HLM) statistical software HLM7 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). The Crosswalk Table displays the constructs and statistical procedures for each research question (see Appendix H). Descriptive statistics provided information for the independent variables for both students and instructors. Student variables included gender, class level, whether the student had the instructor before (repeat instructor), and whether or not the student commuted or lived on campus (campus living); instructor variables included gender, discipline, and years teaching.

For research question 1, an independent samples *t* test was run to determine if there were significant differences between instructor and student perceptions of SoC. Independent t tests were used to compare the means for the predictor variables and the output variable, student SoC. Research question 2 required a single level regression in order to determine if student characteristics (gender, class level, repeat instructor, or campus living) influenced students' perceptions of SoC. The regression analysis supported a better understanding of which independent variables were most influential on students' SoC, the outcome variables Connectedness, Learning, and Total Classroom Community. Results from research questions 1 and 2 analyses provided evidence to use HLM.

HLM is an advanced regression approach that "simultaneously investigates relationships within and between hierarchical levels of grouped data" (Woltman, Feldstain, MacKay, & Rocchi, 2012, p. 53). The data hierarchy of students nested within classes within schools made a two-level HLM the appropriate analytical technique.

"HLM prevents a violation of the assumption of independence, given that students in the same class are not really independent of classroom (group) effects, which would otherwise deflate standard errors and Type 1 errors" (Summers et al., 2005, p. 176). Since HLM partitions the variance between the classes and the students, I could better determine individual-level effects and group-level effects (Umbach & Wawrzynski, 2005). More specifically, HLM was used to identify the relationships between individual student variables (level 1) and class variables (level 2) with students' perceptions of SoC by taking both level 1 and 2 relationships into account. Data were analyzed using a two-level model based on 891 undergraduate students nested within 36 classes from three institutions in a Midwestern state.

Since differences between students' SoC scores in the three outcome variables, Connectedness, Learning, and Total Classroom Community, among classes and institutions were found to be significantly different, it was important to determine if dependent variables at the first and second levels may have influenced students' SoC. Therefore, a two-level hierarchical linear model was used where Level 1 represented students and level 2 represented classes. IBM SPSS data files were created and uploaded in HLM7 for Windows software.

I developed six models to explore the final three research questions. I ran the unconditional model three times for each outcome variable: Connectedness, Learning, and Total Classroom Community. During the first step of the unconditional model, only the outcome (Connectedness, Learning, Total Classroom Community) variances were examined with no predictor variables; this was used to determine the variance within classes on students' SOC as well as between classes and institutions. The unconditional model was also used to calculate the Intraclass Correlation (ICC) in order to determine

which percentage of the variance in students' SOC was attributable to class membership and which percentage was at the individual level. The level 1 and level 2 models are:

Level 1: $Y_{ij} = \beta_{oj} + r_{ij}$

- Y_{ij} is the SOC score (Connectedness, Learning, or Total Classroom Community) for student *i* in class *j*
- β_{oj} is the mean SOC score for class *j*
- r_{ij} is the randome error associated with student *i* in class *j*, $var(r_{ij}) = \sigma^2$

Level 2: $\beta_{oj} = \gamma_{oo} + \mu_{oj}$

- β_{oj} is the average SOC score in class j
- γ_{oo} is the grand mean (intercept)
- μ_{oj} is the class-level random effect, $var(\mu_{oj}) = \tau_{oo}$

Research Questions 3-5 explored the influence of level two predictors on students' perceptions of SOC. HLM was used to analyze the variance between students' SOC and level two effects. Each student participant in this study was already grouped into a classroom with other students and one instructor. Therefore, the data were naturally organized at a student, classroom, and institutional level. Because of the nature of the hierarchically structured data, hierarchical linear modeling (HLM) was needed to account for the varying levels. Furthermore, the unconditional model justified the use of HLM. "HLM can be ideally suited for the analysis of nested data because it identifies the relationship between predictor and outcome variables, by taking both level-1 and level-2 regression relationships into account" (Woltman, Feldstain, MacKay, & Rocchi, 2012, p. 56). Furthermore, HLM takes into account the effects of between- and within-group variance; it also requires fewer assumptions to be met (Woltman et al., 2012).

Limitations

There are limitations in this study. The first limitation is that participants may have withheld information or not been truthful when completing the questionnaire. This

limitation was addressed when I explained the importance of the study so participants understood that their input was important to improve teaching and learning in higher education. Participants were also assured that their answers were completely confidential so they were comfortable participating and providing honest answers.

Generalization is a key limitation to this study since the sample was drawn from only three institutions in a single state in the Midwest. Therefore, the sample may not be generalizable to instructors and students in institutions from other states. Also, the courses and instructors were selected from institutions accessible to me. However, matching students directly with their instructors has not been included in other studies of SoC in traditional postsecondary classrooms. Therefore, this study provides an important approach to understanding the relationship between student and instructor perceptions of SoC. Furthermore, the response rates from instructors and students was very high. By keeping the questionnaire limited to 10 minutes for students and 20 minutes for instructors and going to classes face-to-face, participants were more likely to participate. Therefore, the high response rate lowered the risk of non-response bias and increased the possibility that the survey results were a better representative of the target population.

Chapter III Summary

Research on community in the college classroom reveals that creating a sense of belonging among students and the instructor has benefits on student learning and motivation. Effective instructional methods, such as collaborative learning, also support and contribute to sense of community (SoC). When the instructor and students feel a SoC, the classroom not only becomes a place where each person belongs, but a space for enhanced learning opportunities and personal growth. However, many instructors continue to use traditional, teacher-centered approaches that may not support community.

Furthermore, although there is growing research and interest in classroom community, there are still gaps. Much of the research on classroom community in higher educational institutions focuses on student perceptions of SoC; there are very few studies on instructor perceptions (Kay et al., 2011).

The purpose of this quantitative cross-sectional study was to examine instructor and student perceptions of SoC in the traditional postsecondary classroom. Data, collected through questionnaires, were analyzed to determine whether there was an alignment between instructor and student perceptions of SoC and whether that alignment or misalignment influenced students' perceptions of SoC. These findings may lead to discovering ways to support student learning and inform instructors' decisions regarding effective instruction and classroom management that support SoC within a postsecondary traditional classroom.

CHAPTER IV

RESULTS

Overview of Purpose and Questions

This chapter describes the survey process and results of analysis of the data relevant to the research questions. The research questions were constructed to provide insight about variables that influence student perceptions of Sense of Community (SoC) in the traditional undergraduate postsecondary classroom. The following sections provide information about differences between instructor and students' perceptions of SoC, student characteristics that impacted their perceptions of SoC, and instructor characteristics and instructional methods that impacted students' perceptions of SoC. After analyzing student and instructor variables that influence students' perceptions of SoC, the last section develops a prediction model for level 1 and 2 coefficients that influenced students' perceptions of SoC.

The following questions have guided this study:

1. To what extent is there a difference between instructor and students' perceptions of SoC?
2. What is the influence, if any, of student characteristics (gender, class level, campus living, repeat instructor) on students' perceptions of SoC?
3. What is the influence, if any, of instructor characteristics (gender, years teaching, discipline) on students' perceptions of SoC?
4. What is the influence, if any, of instructional methods on students' perceptions of SoC?
5. To what extent, if any, do instructor perceptions of SoC influence students' perceptions of SoC?

Description of Data

The online questionnaire for instructors included the modified Classroom Community Scale (CCS) and Postsecondary Instructional Practices Survey (PIPS) distributed via email during the spring 2017 semester. The student CCS was distributed to students face-to-face during the middle and end of the spring 2017 semester in March and April. Of the 45 instructors invited to take part in the study, 36 instructors agreed to participate and provided complete data.

By administering the CCS face-to-face, I was able to decrease student nonresponse rates. According to the Faculty Innovation Center at The University of Texas at Austin, "acceptable response rates vary by how a survey is administered" ("Response Rates", n.d., para. 6). When giving a survey face-to-face, the Center suggests that a response rate between 80-85% is good. 908 of the 1174 students enrolled in the 36 classes provided consent to participate; two students did not provide consent. However, 908 students is a conservative number since the number of students seated in each class was not counted when administering the questionnaire; therefore, if students were absent when the questionnaire was given, they did not have the option to participate. 1174 may also be a conservative number since it may not reflect students who dropped or added the classes that were surveyed. From the 908 students who participated, 17 were removed because of incomplete data (1.9% nonresponse rate). According to Fowler (2009), there are two options for handling participant responses that do not provide answers to every item: leaving respondents out of the data set, or estimating the answers participants may have provided. Following statistical convention, 11 students' data were imputed because of one or two missing responses on their questionnaires. "When item nonresponse is less

than, say, 5%, the potential for that nonresponse to distort the estimates is fairly minimal" (Fowler, 2009, p. 158).

The resulting sample size was 36 instructors and 891 students (75.8% response rate). Table 3 provides student response rate information. Each class is listed by institution and includes the number of students enrolled, the number of students who participated in the study, and the response rate percentage.

Table 3

Student Response Rate

Institution/Class	Students enrolled in course	*Students who participated in study	*%*
Institution I			
Class 1	23	22	95.6%
Class 2	25	14	56.0%
Class 3	20	16	80.0%
Class 4	90	37	41.1%
Class 5	48	29	60.4%
Class 6	20	17	85.0%
Institution II			
Class 1	30	25	83.0%
Class 2	31	29	93.5%
Class 3	26	24	92.3%
Class 4	38	24	63.0%
Class 5	27	25	92.5%
Class 6	26	23	88.4%
Class 7	45	38	84.4%
Class 9**	27	21	77.7%
Class 10	40	28	70.0%
Class 11	30	24	80.0%
Class 12	31	30	96.7%
Class 13	35	19	54.0%
Class 14	33	29	87.8%
Class 15	33	27	81.8%
Class 16	24	23	95.8%
Class 17	39	29	74.3%
Institution III			
Class 1	23	21	91.3%
Class 2	30	26	86.6%

Table 3 – continued

Institution/Class	Students enrolled in course	*Students who participated in study	%
Class 3	32	23	71.8%
Class 4	21	21	100%
Class 5	36	30	83.3%
Class 6	70	29	41.4%
Class 7	24	21	87.5%
Class 8	28	27	96.0%
Class 9	25	22	88.0%
Class 10	32	28	87.5%
Class 11	28	28	100%
Class 12	31	12	38.7%
Class 13	23	21	91.0%
Class 14	30	29	96.6%

**numbers are based on the final data set after incomplete participants' data were removed*
***Class 8 from Institution II is missing from the table because that class did not complete the questionnaire*

The instructor sample included 14 females (38.9%) and 22 males (61.1%). Six instructors (16.7%) were from a public university; 16 (44.4%) and 14 (38.9%) instructors were from two small private Christian liberal arts institutions. The instructor sample had a mean of 17.4 (SD = 9.55) years teaching in higher education that ranged from 1-39 years. In order to categorize courses according to discipline, I used Biglan's dimensions. Biglan (1973) based his three dimensions on the characteristics of subject matter in different academic areas: hard/soft, pure/applied, and life/nonlife. Disciplines with "solid, widely accepted paradigms or core areas" (Muffo & Langston, 1981, p. 142) are considered "hard," rather than those outside of core areas that are considered "soft." Disciplines that relate closely with theory are considered "pure," as opposed to courses categorized by application called "applied." Biglan also categorized areas according to "life" and nonlife" descriptions. For the purpose of this study, I used two of Biglan's

three dimensions to describe four categories of disciplines: hard/pure, hard/applied, soft/pure, and soft/applied. Hard/pure includes disciplines such as chemistry or physics; engineering and horticulture are considered hard/applied disciplines. Soft/pure disciplines include English or philosophy, and soft/applied includes disciplines such as accounting or education. Six of the instructors in this study taught courses categorized as hard/pure (16.7%); no instructors taught courses considered hard/applied (0%). The other 29 courses were categorized as either soft/applied (52.8%, n = 18) or soft/pure (30.6%, n = 11). Further demographic information about instructors is displayed in Table 4.

Table 4

Demographics and Characteristics of Instructor Participants

Characteristic	*n*	*M*	*SD*	*%*
Years Teaching		17.41	9.55	
0 – 4.5 yrs.	2			5.7%
5 – 9.5 yrs.	7			19.4%
10 – 19.5 yrs.	14			38.9%
20+ yrs.	13			36.1%
Gender				
Male	22			61.1%
Female	14			38.9%
Discipline				
Hard/Pure	6			16.7%
Hard/Applied	0			0%
Soft/Pure	11			30.6%
Soft/Applied	19			52.8%
Instructors per Institution				
Institution I	6			16.7%
Institution II	16			44.4%
Institution III	14			38.9%

Note: Discipline areas based on Biglan's (1973) dimensions
n = 36

The student sample included 567 females (63.6%) and 324 males (36.4%). Class level was relatively similar among freshman (24.9%, n = 222), sophomores (28.8%, n = 256), and juniors (29.4%, n = 262). There were 135 seniors (15.2%), eight students who considered themselves "other" (0.9%) including duel enrolled students and a guest, and seven students who indicated they were 5th year seniors or Post BA (0.8%); one student did not indicate class level. Of the 891 students, 221 reported having the instructor before (24.8%); 670 had not previously had their instructor (75.2%). 135 students attended the large public university, Institution I (15.2%); 418 (46.9%) and 338 (37.9%) students attended Institutions II and III - two small private liberal arts Christian institutions. More than half of the students indicated that they live on campus (63.5%, n = 566); 325 indicated they commute to school (36.5%). Further demographic information about students is displayed in Table 5.

Table 5

Demographics and Characteristics of Student Participants

Characteristic	*n*	*%*
Gender		
Male	324	36.4%
Female	567	63.6%
Class Level		
Freshman	222	24.9%
Sophomore	256	28.8%
Junior	262	29.4%
Senior	135	15.2%
5th year	7	0.8%
Other	8	0.9%
Students per Institution		
Institution I	135	15.2%
Institution II	418	46.9%
Institution III	338	37.9%

Table 5 – continued

Characteristic	*n*	%
Campus Living		
Yes	566	63.5%
No	325	36.5%
Repeat Instructor		
Yes	221	24.8%
No	670	75.2%

n = 891

Research Question 1

Research Question 1 explored the difference between instructor and students' perceptions of SOC. The constructs that impact perception of SOC are Learning and Connectedness. An independent t-test was used in order to determine if there was a significant difference in mean perceptions of SoC between instructors and students.

Before analyzing the data with an independent samples t-test, I ensured the assumptions for the procedure were met: independent observations, homogeneity of variance, and normally distributed scores. The assumption of independence was met based on the design of the study. Instructors' scores met the assumption of normality; however, students' scores did not ($W(890) = .985$, $p < .001$). Students' scores ranged from 16 to 78 based on an 80 point score. The mean score ($M = 52.85$, $SD = 9.73$) differed from the median score ($Mdn = 54$). The median score may offer a more accurate reflection of the overall distribution. The Normal Q-Q Plot and histogram revealed a slight departure from normality. When reviewing skewness and kurtosis, both statistics fell within ± 1.96. Further visual investigation revealed a slightly negatively skewed and leptokurtic distribution. Outliers were not left out of the data set because of the

importance of each student's score within each classroom; this may explain why the assumption of normality was not met according to the Shapiro Wilk's test. According to Brown (1997), "interpreting … (statistics) depends heavily on the type and purpose of the test being analyzed" (p. 23). To determine the assumption of homogeneity of variance, Levene's test was used. Levene's $F(1, 924) = .184$, $p = .668$, indicated homogeneity of variance was met.

Items from the Classroom Community Scale (CCS) were collapsed, and Cronbach's alphas were calculated. Cronbach alphas for Connectedness, Learning, and Total Classroom Community subscales ranged from .77 and .89 for instructors and students indicating that the scales had good internal consistence. Rovai (2002a), when developing the CCS, estimated excellent internal consistency for the total classroom community scale (.93) and the two subscales (Connectedness, .92; Learning, .87).

In order to form the new variable, Connectedness, the odd items in the CCS were collapsed; the even items were collapsed to form the variable, Learning. All items in the CCS were collapsed to form the new variable, Total Classroom Community. Table 6 provides further information about the descriptive statistics and reliability analysis for each construct. Appendices J and K include the descriptive statistics of instructors and students for each CCS subscale item.

Table 6

Descriptive Statistics and Cronbach's Alphas of Instructors (n = 36) and Students (n = 891) for the Connectedness, Learning, and the Total Classroom Community Subscales

Subscale	# of items	Min	Max	*M(SD)*	*α*
Connectedness	10				
Instructor		1.60	3.70	2.72(.51)	0.86
Student		0.00	3.90	2.46(.57)	0.86
Learning	10				
Instructor		2.00	3.70	2.75(.48)	0.77
Student		0.10	4.00	2.81(.54)	0.82
Total Classroom Community	20				
Instructor		1.85	3.70	2.73(.47)	0.89
Student		0.10	3.90	2.63(.48)	0.89

$\alpha < 0.05$

An independent samples t-test was run to determine whether there were differences between instructors and students' SOC means ($p < .05$). The independent variable was status; the dependent variables were connectedness, learning, and total classroom community. The independent t-test revealed that there were no significant differences between instructors and students' mean perceptions of SOC based on each construct. An independent t-test was also run to explore differences in instructors and students' scores based on gender. No significant differences were found among females. However, there was a significant difference among male instructors and male students' perceptions of connectedness ($t(344) = 2{,}602$, $p = .01$). Instructors' scores ($M = 2.74$, $SD = .50$) were greater than students' scores ($M = 2.39$, $SD = .60$) which indicated that male instructors perceived a greater sense of connectedness than male students. Table 7 shows means and standard deviations for instructor characteristics.

Table 7

Means and Standard Deviations of Instructors for Demographic Characteristics

Characteristic	*n*	Connectedness	Learning	Classroom Community
Gender				
Male	22	2.74(.50)	2.75(.45)	2.74(.44)
Female	14	2.69(.55)	2.75(.58)	2.72(.53)
Instructors per Institution				
Institution I	6	2.75(.55)	2.88(.53)	2.81(.53)
Institution II	16	2.72(.53)	2.82(.42)	2.77(.44)
Institution III	14	2.70(.51)	2.62(.56)	2.66(.51)
Discipline				
Hard pure	6	2.70(.46)	2.75(.48)	2.72(.46)
Hard applied	0	--	--	--
Soft pure	11	2.62(.58)	2.68(.52)	2.65(.50)
Soft applied	19	2.78(.51)	2.80(.50)	2.79(.48)
Number years teaching				
0 – 4.5 yrs.	2	2.25(.35)	2.50(.42)	2.37(.38)
5 – 9.5 yrs.	7	2.60(.70)	2.57(.45)	2.58(.49)
10 – 19.5 yrs.	14	2.75(.53)	2.82(.51)	2.78(.51)
20+ yrs.	13	2.82(.38)	2.82(.52)	2.82(.43)

n = 36

Table 8 shows the means and standard deviations for instructors and students by institution and class. Upon further inspection of the table, there were noticeable instructor and student mean differences within classes. Therefore, I ran another independent t-test to investigate differences between the instructor and students in each class.

Table 8

Means and Standard Deviations of Students (n=891) and Instructors (n=36) by Institution and Class

Institution/ Class	Connectedness		Learning		Classroom Community	
	Instructor	Student	Instructor	Student	Instructor	Student
Institution I	2.75(.55)	2.43(.62)	2.88(.53)	2.89(.60)	2.81(.53)	2.66(.54)
Class 1	3.70	2.82(.31)	3.70	3.00(.37)	3.70	2.91(.29)
Class 2	2.30	2.65(.33)	2.20	2.84(.22)	2.25	2.74(.25)
Class 3	2.80	2.96(.52)	3.00	3.52(.40)	2.90	3.24(.44)
Class 4	2.10	1.88(.69)	2.40	2.54(.65)	2.25	2.21(.61)
Class 5	2.70	2.45(.41)	3.00	2.87(.55)	2.85	2.66(.35)
Class 6	2.90	2.40(.45)	3.00	3.04(.68)	2.95	2.72(.45)
Institution II	2.72(.53)	2.48(.58)	2.82(.42)	2.68(.56)	2.77(.44)	2.58(.50)
Class 1	3.10	2.53(.53)	3.50	2.81(.51)	3.30	2.67(.49)
Class 2	2.60	2.66(.61)	2.70	3.09(.39)	2.65	2.87(.44)
Class 3	3.00	2.67(.50)	3.00	2.80(.59)	3.00	2.74(.52)
Class 4	3.00	2.46(.46)	2.20	2.85(.35)	2.60	2.66(.33)
Class 5	3.00	2.51(.49)	3.00	2.86(.51)	3.00	2.69(.45)
Class 6	3.20	2.68(.55)	3.20	2.86(.39)	3.20	2.77(.40)
Class 7	1.70	1.95(.63)	2.00	2.42(.48)	1.85	2.19(.48)
Class 9	3.10	2.76(.56)	3.10	3.09(.39)	3.10	2.92(.44)
Class 10	2.70	2.70(.34)	2.60	2.88(.52)	2.65	2.79(.37)
Class 11	2.90	2.20(.43)	2.90	2.31(.63)	2.90	2.25(.44)
Class 12	2.90	2.66(.55)	3.00	2.59(.51)	2.95	2.62(.47)
Class 13	1.60	2.07(.56)	2.60	2.11(.62)	2.10	2.09(.54)
Class 14	2.80	2.60(.44)	3.10	2.81(.36)	2.95	2.70(.26)
Class 15	2.00	2.20(.45)	2.20	2.33(.51)	2.10	2.27(.44)
Class 16	2.50	2.71(.72)	2.80	2.58(.62)	2.65	2.65(.61)
Class 17	3.50	2.45(.50)	3.30	2.59(.57)	3.40	2.52(.46)
Institution III	2.70(.51)	2.46(.55)	2.62(.56)	2.92(.45)	2.66(.51)	2.69(.44)
Class 1	3.20	2.44(.52)	3.40	3.07(.36)	3.30	2.75(.40)
Class 2	2.30	2.33(.53)	2.40	2.92(.41)	2.35	2.63(.42)
Class 3	2.50	2.03(.49)	2.30	2.84(.35)	2.40	2.44(.35)
Class 4	3.40	2.61(.55)	3.60	2.77(.60)	3.50	2.69(.53)
Class 5	2.20	2.32(.44)	2.10	2.88(.39)	2.15	2.60(.37)
Class 6	2.20	2.28(.48)	2.00	2.80(.43)	2.10	2.54(.41)
Class 7	3.20	2.60(.42)	2.10	2.91(.32)	2.65	2.75(.26)
Class 8	1.90	2.61(.46)	2.30	2.95(.37)	2.10	2.78(.32)
Class 9	2.30	2.48(.55)	2.50	2.75(.42)	2.40	2.62(.42)
Class 10	2.90	2.36(.44)	2.60	3.05(.38)	2.75	2.71(.37)

Table 8 – continued

Institution/ Class	Connectedness		Learning		Classroom Community	
	Instructor	Student	Instructor	Student	Instructor	Student
Class 11	2.70	2.35(.67)	2.30	2.92(.49)	2.50	2.63(.54)
Class 12	2.40	2.42(.40)	2.30	2.45(.43)	2.35	2.44(.37)
Class 13	3.50	2.63(.58)	3.50	3.03(.55)	3.50	2.83(.54)
Class 14	3.20	3.00(.46)	3.30	3.24(.45)	3.25	3.12(.41)
Overall						
Instructor	2.72(.51)		2.75(.49)		2.73(.47)	
Students	2.46(.57)		2.81(.54)		2.63(.49)	

Note: CCS scores ranged from 0 (strongly disagree) to 4.00 (strongly agree), reverse-scored items reflected the most favorable choice as 4.00 and least favorable as 0 (Rovai, 2002a)

The assumption of normality was not met when reviewing each class. Skewness and kurtosis scores were measured within +/- 1.96. Skewness scores for each class fell within ±1.96. 11 classes were positively leptokurtic, and the rest fell within a normal distribution. Overall, 24 out of the 36 classes did not meet the assumption of normality in one or all of the three constructs: connectedness, learning, and total classroom community. Perhaps the non-normal distribution within classes was a result of the numbers of individuals per class. The numbers of students who participated per class ranged from 12 to 38. Another possible reason scores were not normally distributed was because of outliers. Because of the design of the study and the nature of the data that were nested, I left outliers in the data set. Outliers' scores affected the distribution of scores within and between classes. However, according to Hoffmann (1997) "To have adequate power (i.e., .90) to detect cross-level interactions (i.e., level-2 slope relationships), a sample of 30 groups with 30 individuals is necessary" (p. 740). The number of students in each class may be fewer than 30 since power increases with the

number of groups rather than individual participants. The benefit of keeping all students' scores in the data set outweighed violating the assumption of normality since each student's score within a class represented an accurate representation of the variety of scores. Since the study included over 30 classes, adequate power was maintained.

A significant difference in mean perceptions of learning was found between the instructor and students in Institution II, class 7 ($t(20) = -2.43$, $p = .02$). The average score of students' learning ($M = 2.91$, $SD = .32$) was greater than their instructor ($M = 2.10$), indicating that students perceived higher levels of learning than their instructor. There was also a significant difference in perceptions of learning among the instructor and students in Institution I, class 2 ($t(13) = -2.72$, $p = .02$). The students' mean score ($M = 2.84$, $SD = .22$) was greater than their instructor ($M = 2.20$). Both connectedness and total classroom community scores were significantly different between students and their instructor for Institution I, class 1 (connectedness: $t(21) = 2.74$, $p = .012$; total classroom community: $t(21) = 2.64$, $p = .015$). In this class, the instructor's scores for both connectedness ($M = 3.70$) and total classroom community ($M = 3.70$) were greater than students' scores (connectedness: $M = 2.82$, $SD = .31$; total classroom community: $M = 2.91$, $SD = .29$). This difference suggests that the instructor perceived a greater sense of connectedness and total classroom community than the students within that class.

When an independent t-test was run for each institution, a significant difference among instructors and students' scores was found in Institution III for learning ($t(350) = -2.43$, $p = .015$). Students' scores ($M = 2.92$, $SD = .45$) were significantly greater than instructors' scores ($M = 2.62$, $SD = .56$) suggesting that students perceived a higher level of learning than their instructors' in Institution III.

After running independent t-tests on the complete data set, I recognized the need to investigate differences between instructor and students' perceptions of SoC further, particularly at a classroom level. The presence of classroom differences cannot be ignored when exploring relationships within specific contexts. Effects that are unique to a classroom and the individual instructor may impact students within that class. Different level effects, therefore, warrant a more complex statistical model when exploring instructor and student differences of SOC with a higher level of statistical confidence.

Research Question 2

The second research question explored the influence, if any, of student characteristics (gender, class level, repeat instructor, campus living) on students' perceptions of SoC. In order to determine and analyze the extent to which students' perceptions were influenced by student characteristics, a single level regression was used. According to Keppel and Wickens (2004), the best way to explain a relationship between two variables is by a straight line, which is linear regression. Single level regression shows the variation in the dependent variable explained by the variance of each independent variable based on the coefficient of determination (R^2).

T-tests and ANOVAs revealed several differences among students' scores for the three constructs: Connectedness, Learning, and Total Classroom Community for the following dependent variables: campus living, repeat instructor, gender, class-level, and class grouping. Table 9 includes descriptive statistics for student demographic characteristics.

Table 9

Means and Standard Deviations of Students for Demographic Characteristics

Characteristic	*n*	Connectedness *m*(*SD*)	Learning *m*(*SD*)	Total Classroom Community *m*(*SD*)
Gender				
Male	324	2.39(.60)	2.74(.54)	2.57(.49)
Female	567	2.50(.55)	2.84(.53)	2.67(.48)
Class Level				
Freshman	222	2.43(.63)	2.74(.56)	2.59(.54)
Sophomore	256	2.47(.54)	2.85(.53)	2.66(.48)
Junior	262	2.52(.53)	2.83(.52)	2.67(.44)
Senior	135	2.35(.59)	2.77(.55)	2.56(.49)
5^{th} year	7	3.07(.45)	3.17(.67)	3.12(.48)
Other	8	2.37(.52)	3.08(.27)	2.73(.32)
Students per Institution				
Institution I	135	2.43(.62)	2.89(.60)	2.66(.54)
Institution II	418	2.48(.58)	2.68(.56)	2.58(.50)
Institution III	338	2.46(.55)	2.92(.45)	2.69(.44)
Campus Living				
Yes	566	2.46(.57)	2.78(.54)	2.62(.49)
No	325	2.46(.57)	2.86(.53)	2.67(.48)
Repeat Instructor				
Yes	221	2.66(.47)	2.98(.46)	2.82(.41)
No	670	2.40(.59)	2.75(.55)	2.57(.50)

n = 891

Campus living and commuter scores on Connectedness, Learning, and Total Connectedness met the assumption of independence based on the design of the study. Skewness and kurtosis were measured within +/- 1.96 and examined using SPSS descriptive statistics. Both groups' scores fell within a normal distribution for each construct except for campus living scores on Total Classroom Community (*M* = 2.67, *SD* = .48) which was slightly positively leptokurtic. Further inspection of the histograms and

Q-Q plots showed that the rest of the scores were approximately normally distributed. However, the assumption of normality was not met for all three constructs according to the Shapiro-Wilk's test for normality ($p > .05$). Homogeneity of variance was tested using Levene's procedure indicating that the assumption was violated and equal variances were not assumed. Students that lived on campus ($M = 2.86$, $SD = .53$) had greater perceptions of learning than commuters ($M = 2.78$, $SD = .54$) at $t(889) = 2.25$, $p = .03$.

Statistically significant differences were found in all three constructs between students who had an instructor before and students who had not had an instructor before. When running tests for the assumption of normality and homogeneity, assumptions were violated according to Shapiro-Wilk and Levene's tests. Levene's test ($p > .05$) indicated that equal variances could not be assumed (Connectedness, $F(1, 888) = 11.95$, $p = .001$; Learning, $F(1, 888) = 8.88$, $p = .003$; Total Classroom Community, $F(1, 888) = 11.17$, $p = .001$). Although Shapiro-Wilk's test indicated that none of the scores met the assumption for normality, measures of skewness and kurtosis fell between +/- 1.96. Further inspection of the sample's histograms and Q-Q plots showed both samples' scores for each construct were approximately normally distributed. Connectedness was significant at $t(458) = 6.53$, $p = .001$ showing that students who had instructors before ($M = 2.66$, $SD = .47$) perceived more connectedness than students who had not had instructors before ($M = 2.40$, $SD = .59$). Learning was significant at $t(445) = 6.23$, $p = .003$. Again, students with repeat instructors ($M = 2.98$, $SD = .46$) perceived greater learning than students who had not had the instructor previously ($M = 2.75$, $SD = .55$). Total Classroom Community was also significant at $t(889) = 6.60$, $p = .001$. Students

who had an instructor before (M = 2.82, SD = .41) perceived a greater amount of total classroom community than their counterparts (M = 2.57, SD = .50).

Both male and female scores fell within a normal distribution for each construct based upon measures of skewness and kurtosis that fell within +/- 1.96. However, the Shapiro-Wilk's test ($p > .05$) showed that male and female scores on the three constructs did not meet the assumption of normality. The assumption of homogeneity was tested using Levene's procedure indicating equal variance among scores (Connectedness, $F(1, 888) = 1.77$, $p = .18$; Learning, $F(1, 888) = .125$, $p = .72$; Total Classroom Community, $F(1, 888) = .038$, $p = .85$). Female students (M = 2.51, SD = .55) experienced a greater sense of connectedness than male students (M = 2.41, SD = .60) with a significance level of $t(925) = -2.43$, $p = .02$. The difference between female (M = 2.84, SD = .54) and male's (M = 2.74, SD = .53) perceptions of learning was also significant ($t(925) = -2.74$, $p = .006$). Female students (M = 2.68, SD = .48) had a greater sense of total classroom community than male students (M = 2.58, SD = .49) at $t(925) = -2.93$, $p = .003$.

The assumption of normality was not met for students' scores among class level. Skewness and kurtosis scores were measured within +/- 1.96. Skewness scores for each class level fell within +/- 1.96. Seniors scores were positively leptokurtic for the Learning and Total Classroom constructs. The other class levels fell within a normal distribution. The assumption of homogeneity was met when Levene's test was run indicating that equal variances could be assumed. Analysis of variance (ANOVA) revealed statistically significant differences between students of different class levels among the three constructs: Connectedness, $F(5, 884) = 3.25$, $p = .006$, partial $\eta^2 = .018$; Learning, $F(5, 884) = 2.29$, $p = .04$, $\eta^2 = .012$; and Total Classroom Community $F(5, 884) = 2.95$, $p = .04$, $\eta^2 = .016$. The small effect sizes suggest that the differences among students' scores

were not great. To assess pairwise differences among the class levels for each construct, the Tukey procedure was performed (p = .05). The results indicated significant differences in connectedness between freshman (M = 2.43, SD = .63) and fifth year seniors (M = 3.07, SD = .45). Connectedness and Total Classroom Community were also significantly different between seniors and fifth year seniors. Fifth year seniors experienced a greater sense of Connectedness (M = 3.07, SD = .45) and Total Classroom Community (M = 2.56, SD=.49) than seniors (Connectedness, M = 2.35, SD = .59; Total Classroom Community, M = 2.56, SD = .49).

The assumption of normality was not met when examining students' scores by class. Skewness and kurtosis were examined using SPSS descriptive statistics and measured within +/- 1.96. Skewness scores for each class fell within +/- 1.96. 11 classes were positively leptokurtic, and the rest fell within a normal distribution. Overall, 24 out of the 36 classes did not meet the assumption of normality in one or all of the three constructs: Connectedness, Learning, and Total Classroom Community.

Pearson's correlation was used in order to measure the strength and direction of association between the dependent and independent variables. The assumptions of independence, normality, homoscedasticity, and linearity were all met when reviewing student data. The assumption of independence was met due to the data collection procedure followed for the study and previously described in chapter 3. The sample size (n = 891) was large enough to assume normal distribution. There was independence of residuals as visually inspected by histograms and a normal probability plot. Finally, collinearity, the extent to which independent variables correlated with each other, was examined by reviewing Pearson product-moment correlation coefficients. Results ranged between <0.001 to -0.37, indicating that the independent variables, gender, campus

living, class level, and repeat instructor, were independent of each other. According to Tanner (2012), correlation coefficients within the range of "0 to .3 are considered 'weak'" (p. 271). The correlation between senior class level and campus living (r = -0.30, $p < .001$) showed a negative correlation that was considered mildly correlated. campus living was coded according to whether students lived on campus or not; therefore, 0 stood for commute (or did not live on campus) and 1 represented living on campus. The correlation between seniors and living on campus made sense since the strength of a correlation is context-specific (Tanner, 2012). Upper-level students are more likely to live off-campus and commute. See Appendix I for the correlation matrix.

A single level regression was run to determine what extent student characteristics and level 1 variables (gender, class level, repeat instructor, and campus living) predict students' perceptions of connectedness, learning, and total classroom community. Eight independent variables were entered into the regression model using SPSS: gender, repeat instructor, campus living, dual enrolled, freshman, sophomore, senior, and fifth year. Since there were six categorical variables for class level, the variables were dummy coded. Junior status was not coded in order to create two values, yes or no (i.e., 1 or 0), for each of the other variables. Thus, the junior level was the category to which the other categories were compared. Assumptions were tested and no violations of normality, linearity, or homoscedasticity were detected. Table 10 shows the regression coefficients (B), intercept, and standardized regression coefficients (β) for each dependent variable.

Table 10

Regression Coefficients Predicting Student Connectedness, Learning, and Total Classroom Community

	Connectedness			Learning			Total Classroom Community		
Predictor	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Constant	2.40	0.47		2.75	0.04		2.58	0.04	
Gender	0.08	0.04	0.07*	0.08	0.04	0.07*	0.08	0.03	0.08*
Dual Enrolled	-0.10	0.20	-0.01	0.27	0.19	0.05	0.10	0.17	0.02
Freshman	-0.02	0.06	-0.02	<0.01	0.05	<0.01	-0.01	0.05	-0.01
Sophomore	-0.02	0.05	-0.02	0.07	0.05	0.06	0.02	0.04	0.02
Senior	-0.20	0.06	-0.12*	-0.10	0.06	-0.10	-0.15	0.05	-0.12*
Fifth Year	0.50	0.21	0.08*	0.27	0.20	0.05	0.38	0.18	0.07*
Repeat Instructor	0.27	0.05	0.20*	0.24	0.04	0.19*	0.25	0.04	0.22*
Campus Living	-0.01	0.04	-0.01	-0.10	0.04	-0.09*	-0.06	0.04	-0.06
R^2		0.06			0.06			0.07	
F		7.32*			6.82*			8.61*	

*p < .05

Regression analysis revealed that the model significantly predicted Connectedness ($F(8, 882) = 7.32$, $p < 001$), Learning ($F(8, 882) = 6.82$, $p < 001$), and Total Classroom Community ($F(8, 882) = 8.61$, $p < 001$). In terms of individual relationships between the independent and dependent variables, gender ($t = 2.02$, $p = 0.04$), repeat instructor ($t = 5.79$, $p > .001$), and fifth year status ($t = 2.30$, $p = 0.02$) each positively significantly predicted Connectedness (see Table 9 for means and standard deviations). Senior class level status ($t = -3.32$, $p = 0.001$) negatively predicted Connectedness. Because of dummy coding, each class variable was compared to the junior group. Therefore, the results of being a senior, with a negative beta coefficient, suggested that seniors have less sense of

connectedness in the classroom than juniors. However, students in their fifth year have a greater sense of connectedness than juniors based on the positive beta coefficient. R^2 for Connectedness was 0.06. Therefore, 6% of the variance in students' perceptions of connectedness could be explained by gender, repeat instructor, senior, and fifth year class level.

Student gender ($t = 2.16$, $p = .031$) and repeat instructor ($t = 5.46$, $p < .001$) both positively predicted Learning. On the other hand, being a commuter ($t = -2.45$, $p = 0.01$) negatively predicted students' perceptions of learning. Student gender, repeat instructor, and campus living explained 6% of the variance in students' perceptions of learning based on the effect size, R^2, for the model.

The regression model for Total Classroom Community indicated that student gender ($t = 2.42$, $p = 0.02$), repeat instructor ($t = 6.43$, $p < .001$), and fifth year class level were all positive significant predictors of students' sense of total classroom community. Senior class level ($t = - 2.90$, $p = 0.004$) negatively predicted Total Classroom Community. Again, class level was measured in comparison to the junior group, indicating that seniors had less sense of total classroom community than juniors, and fifth year students had a greater sense of total classroom community compared with juniors. The R^2 value indicated that 7% of the variance in students' perceptions of total classroom community could be explained by gender, repeat instructor, senior status, and fifth year status.

Research Questions 3 – 5

The third, fourth, and fifth research questions considered two-level effects on the outcome variables: Connectedness, Learning, and Total Classroom Community. The third research question asks, what is the influence, if any, of instructor characteristics (gender,

discipline, years teaching) on students' perceptions of SoC? The fourth question inquires about the influence of instructional methods on students' perceptions of SoC. The final research question asks whether instructors' perceptions of SoC influence students' perceptions of SoC. In order to address the two-level effects on the outcome variables, Connectedness, Learning, and Total Classroom Community, IBM SPSS data files were uploaded into HLM for analysis. HLM models were developed and run in HLM 7.03 for Windows Software. All assumptions were met in order to run an HLM.

Unconditional Models

In order to determine whether HLM was appropriate for this data, I first ran unconditional models, referred to as one-way ANOVAs with random effects, for each of the outcome variables for student SoC: Connectedness, Learning, and Total Classroom Community. The unconditional models were run in order to determine whether there was significant variance among students, classes, and institutions for each outcome variable. Although a three-level HLM model was initially run, data at the institutional level did not yield enough power since only three institutions were included in the study.

The unconditional models did not include predictor variables at any level since the unconditional model is intended to estimate the average effect size within classes (fixed effect model) and the variance of the effect size parameters between classes (random effect model). Table 11 provides the results of the unconditional models for each outcome variable for a two-level HLM. Each unconditional model is represented by Equation 1:

$$Y_{ij} = \beta_{0j} + r_{ij} \quad (1)$$

Table 11

Hierarchical Linear Modeling (HLM) Results of the Unconditional Models

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Intercept				
Connectedness	2.49	0.04	57.81	<0.001
Learning	2.82	0.05	62.98	<0.001
Total Classroom Community	2.65	0.04	67.01	<0.001
Random Effects	**Variance**	***df***	**Chi-Square**	***p***
Between-class variability (intercept)				
Connectedness	0.06	35	233.21	<0.001
Learning	0.06	35	258.55	<0.001
Total Classroom Community	0.05	35	262.44	<0.001
Within-class variability (intercept)				
Connectedness	0.27			
Learning	0.24			
Total Classroom Community	0.19			
Reliability				
Connectedness	0.83			
Learning	0.87			
Total Classroom Community	0.86			
Intraclass Correlations (ICC)	**Coefficient**			
ICC among classes				
Connectedness	0.18			
Learning	0.20			
Total Classroom Community	0.21			

* p < .05

The results of the unconditional models yield significant results for the three outcome variables at level 2: Connectedness, χ^2 (35) = 233.21, $p < 0.001$; Learning, χ^2 (35) = 258.55, $p < 0.001$; and Total Classroom Community, χ^2 (35) = 262.44, $p < 0.001$.

These results indicated that there was variance in each outcome variable by the level 2 groupings.

As an additional step, I calculated an Intraclass Correlation (ICC) to determine the proportion of variance in each outcome variable attributed to the group levels, and which proportion could be attributed at the individual level. The ICC is represented by Equation 2:

$$\hat{\rho} = \tau_{00} / (\tau_{00} + \sigma^2) \qquad (2)$$

The ICC for Connectedness for level 2 was 0.18 (0.06 / 0.06 + 0.27 = .18). Thus, approximately 18% of the variance in student sense of connectedness lies between classes and 82% lies within classes. The ICC for Learning was 0.20 (0.06 / 0.06 + 0.24 = .20) and 0.21 for Total Classroom Community (0.05 / 0.05 + 0.19 = 0.21), indicating that 20% of the variance in student sense of learning lies between classes and 80% lies within classes; 21% of the variance in total classroom community lies between classes and 79% lies within classes. Running the HLM analysis was justified at the second level, but not at the third level.

Conditional Models

Since variance existed at both level 1 and level 2 of the data structure, the next step of the analysis involved adding student and class-level predictor variables to the unconditional model. The purpose of a conditional analysis is to build a model that predicts effect sizes with all level 2 variables included in the model (fixed effect model) as well as estimate the residual variance across classes (random effect model). Each conditional model controlled for student level characteristics at level 1 and was estimated using class level variables (instructor characteristics: gender, years teaching, and discipline categories; instructional methods: 2 Factor PIPS and the 5 Factor PIPS; and

instructors' perceptions of SoC: Connectedness, Learning, and Total Classroom Community) to predict students' perceptions of SoC: Connectedness, Learning, and Total Classroom Community.

Adding level 1 variables to an unconditional model is the same as running a single level regression. However, the results from the single level regression and hierarchical linear modeling showed slightly different results, which may be explained by the different software used for each analysis. I used the results from the HLM analysis at level 1 to build the conditional models.

As previously mentioned, Class Level was dummy coded for the regression. When determining which class level to drop for the HLM, I selected freshman, since it was the most logical category to compare with other class levels. Since the experiences of a dual enrolled or fifth year senior may be different from students in other class levels, those groups were left out of the model. Furthermore, both groups (dual enrolled, n = 7; fifth year, n = 8) had few participants, which had an impact on running the HLM analysis.

Discipline was dummy coded according to the Biglan (1973) categories: Hard/Pure, Soft/Pure, Hard/Applied, and Soft/Applied. There were no classes in the Hard/Applied category; therefore, it was not included. The Soft/Applied category was dropped when running the fully conditional model; therefore, Hard/Pure and Soft/Pure were compared with Soft/Applied. The following sections will explain the conditional analysis by outcome variable: Connectedness, Learning, and Total Classroom Community.

Connectedness

All level one variables were included in the unconditional model: gender, repeat instructor, campus living, sophomore, junior, and senior. Results of the level 1 partially conditional model are shown in Table 12. Presented in structural format, the Level 1 partially conditional model is shown in equation 3:

$$CONNECT_{ij} = \beta_{0j} + \beta_{1j}*(GENDER_{ij}) + \beta_{2j}*(REPEAT_{ij}) + \beta_{3j}*(LIVES\_ON\_CAMPUS_{ij}) + \beta_{4j}*(SOPHOMORE_{ij}) + \beta_{5j}*(JUNIOR_{ij}) + \beta_{6j}*(SENIOR) + r_{ij} \quad (3)$$

On average, Repeat Instructor was significantly and positively related to student sense of connectedness ($\gamma = 0.10$, $p = 0.04$) with a small effect size (effect size = .16). This result indicates that students who had instructors prior to taking the class reported 0.10 higher scores on measures of connectedness. Senior status ($\gamma = -0.26$, $p < 0.001$) had a significantly negative, moderate effect on connectedness compared with freshmen (effect size = .46). Seniors reported .26 lower scores on measures of connectedness than freshman. Taken as a whole, these findings indicate that student-level variables accounted for approximately 4% of the within-class variance in connectedness in classes. This was determined by calculating the effect size using equation 4.

$$R^2 = \sigma^2 (uncond) - (\sigma^2 (cond) / \sigma^2 (uncond)) = 0.27 - (0.26 / 0.27) = 0.04 \quad (4)$$

Table 12

Hierarchical Linear Modeling Results of the Partially Conditional Model (Level 1) for Connectedness

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Student-level variable				
Intercept	2.49	0.04	57.29	<0.001*
Gender	0.05	0.03	1.56	0.13
Repeat Instructor	0.11	0.05	2.48	0.02*
Campus Living	-0.02	0.05	-0.41	0.68
Sophomore	-0.08	0.05	-1.50	0.14
Junior	-0.13	0.06	-2.21	0.03*
Senior	-0.27	0.06	-4.24	<0.001*

* $p < 0.05$

Next, level 2 predictor variables (instructor characteristics, instructional methods, and instructors' SoC) were included into the level 1 partially conditional model to determine variables responsible for the variation in students' sense of connectedness between classes. The fully conditional model included all the level 1 variables and the following level 2 variables: instructor gender, years teaching, the 5 factor PIPS, instructor total classroom community, hard/pure, and soft/pure. The 5 factor PIPS was included into the model for Connectedness because it yielded stronger effect sizes than the 2 factor PIPS. Instructor sense of Total Classroom Community was included over the Learning and Connectedness constructs since Total Classroom Community had a greater effect size. The fully conditional model for Connectedness is shown in equation 5:

$$CONNECT = \gamma_{00} + \gamma_{01}*(GENDER\_I_j) + \gamma_{02}*(YRS\_TEACH_j) + \gamma_{03}*(F1_j) + \gamma_{04}*(F2_j) + \gamma_{05}*(F3) + \gamma_{06}*(F4) + \gamma_{07}*(F5) + \gamma_{08}*(TOTAL\_INSTRUCTOR_j) + \gamma_{09}*(HARDPURE_j) + \gamma_{010}*(SOFTPURE_j) + \gamma_{10}*(GENDER\_S) + \gamma_{20}*(REPEAT) + \gamma_{30}*(LIVES\_ON\_CAMPUS) +$$

Equation 5 - continued

$$\gamma_{40}*(SOPHOMORE) + \gamma_{50}*(JUNIOR) + \gamma_{60}*(SENIOR) + u_{0j} + u_{1j}*(GENDER\_S_{ij}) +$$

$$u_{2j}*(REPEAT_{ij}) + u_{3j}*(LIVES\_ON\_CAMPUS_{ij}) + u_{4j}*(SOPHOMORE_{ij}) +$$

$$u_{5j}*(JUNIOR_{ij}) + u_{6j}*(SENIOR_{ij}) + r_{ij} \quad (5)$$

See Table 13 for the results of the fully conditional model. The descriptions following the table explain the results of the fully conditional model based on each research question for Connectedness.

Table 13

Hierarchical Linear Modeling (HLM) Results of the Fully Conditional Model for Connectedness

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Intercept	2.49	0.02	109.00	<0.001*
Student-level variable				
Gender (student)	0.06	0.03	1.74	0.09
Repeat Instructor	0.10	0.05	1.94	0.06
Campus Living	-0.03	0.05	-0.52	0.60
Sophomore	-0.06	0.05	-1.26	0.22
Junior	-0.11	0.06	-1.89	0.06
Senior	-0.26	0.06	-4.08	<0.001*
Class-level variable				
Gender (Instructor)	0.16	0.04	4.10	<0.001*
Years Teaching	<0.01	<0.01	1.25	0.23
F1: Student-Student Interactions	0.05	0.04	1.28	0.21
F2: Content Delivery	-0.18	0.04	-4.53	<0.001*
F3: Formative Assessment	-0.02	0.04	-0.42	0.68
F4: Student-Content Engagement	-0.19	0.04	-4.20	<0.001*
F5: Summative Assessment	-0.02	0.03	-0.68	0.51
Total Classroom Community (Instructor)	0.32	0.05	6.26	<0.001*
Hard/Pure	-0.06	0.06	-0.99	0.33
Soft/Pure	-0.12	0.06	-1.97	0.06

Table 13 - continued

Random Effects	Variance	*df*	Chi-Square	*p*
Between-class variability (intercept)	0.02	7	46.69	<0.001*
Within-class variability (intercept)	0.26			
Proportion of variance explained improvement of Model 2 over Model 1	0.67			

* $p < 0.05$

Instructor characteristics. The third research question asked whether instructor characteristics, instructor gender, years teaching, and discipline, had an influence on students' perceptions of SoC. Of the three predictor variables for instructor characteristics, instructor gender ($\gamma = 0.16$, $p < 0.001$) had a significantly positive, small effect on student sense of connectedness (effect size = .28). Female was coded as 1 and male as 0; therefore, having a female instructor is associated with a 0.16 gain in students' sense of connectedness.

Instructional methods. Research question four addressed the impact of instructional methods upon students' SoC. Prior to using HLM, items from the Postsecondary Instructional Practices (PIPS) were collapsed, and Cronbach's alphas were calculated. New variables were created for the Post-secondary Instructor Practices Survey (PIPS) for the two and five factor models. The two factor model was collapsed into two new variables: Student-Centered Practice (SCP) and Instructor-Centered Practice (ICP). PIPS items were also collapsed into the following five variables: (F1) Student-Student Interactions, (F2) Content Delivery, (F3) Formative Assessment, (F4) Student-Content Engagement, and (F5) Summative Assessment. Appendix L shows the descriptive statistics for each item of the PIPS organized by construct and category. Cronbach alphas

for the PIPS subscales varied by model. Although the Student-Centered Practice subscale had a good internal consistency (α = 0.84), the Instructor-Centered Practice subscale was questionable (α = 0.66). These reliability scores are very similar with Walter et al. (2016) who calculated .87 for the SCP, and .67 for the ICP. The scales of the five factor model ranged from poor (α = 0.50) to acceptable (α = 0.79). These findings varied from Walter et al. For example, the reliability score I calculated for Factor 2, Content Delivery, was 0.50; the scored calculated by Walter et al. was 0.64. Reliability scores increased for Factors 4 and 5, however. I calculated 0.78 for Factor 4, Student-Content Engagement, and Walter et al. calculated 0.45. Factor 5, Summative Assessment was calculated by Walter et al. (2014) as 0.61, and I calculated 0.78. Reliability scores for the other factors were similar. Table 14 provides further information about the reliability analysis for each construct.

Table 14

Means, Standard Deviations, and Cronbach's Alphas for the Postsecondary Instructional Practices Two and Five Factor Models

Two Factor Model	*M*	*SD*	α
Instructor-Centered Practice (ICP)	18.39	5.57	0.66
Student-Centered Practice (SCP)	33.64	9.04	0.84
Five Factor Model	***M***	***SD***	α
F1: Student-Student Interactions	13.31	4.80	0.79
F2: Content Delivery	9.28	2.72	0.50
F3: Formative Assessment	10.22	3.28	0.59
F4: Student-Content Engagement	11.97	3.52	0.78
F5: Summative Assessment	7.25	4.03	0.77

The two and five factor PIPS were added to the fully conditional models separately to determine which contributed to the best model fit. For Connectedness, the

five factor PIPS yielded a higher effect size and was included into the model. Two of the five factors had significantly negative, moderate effects on students' sense of connectedness. Factor 2, Content Delivery ($\gamma = -0.18$, $p < 0.001$), was negatively related to student sense of connectedness indicating that when an instructor's score on Content Delivery increased, students' perceptions of connectedness decreased (effect size = 0.32). Similarly, Factor 4, Student-Content Engagement ($\gamma = -0.19$, $p < 0.001$), revealed that one unit increase in Student-Content Engagement was associated with a 0.19 decrease in student sense of connectedness.

Instructor perceptions of SoC. Instructor perceptions of SoC, Connectedness, Learning, and Total Classroom Community, were also added to the fully conditional model. The fifth research question addressed the influence of instructor perceptions of SoC on students' perceptions of SoC. Instructor perceptions of Total Classroom Community was isolated in an independent analysis since it was formed as a variable by combining the Connectedness and Learning variables. Total Classroom Community was included into the conditional model since it had a greater impact on the effect size of the final model. Instructor Total Classroom Community ($\gamma = 0.32$, $p < 0.001$) had a significantly positive, large effect size on students' sense of connectedness (effect size = 0.56). This result indicates that one unit increase in instructors' sense of total classroom community is associated with a gain of 0.32 on students' sense of connectedness scores.

The results of the Chi-squared test ($\chi^2 = 46.69$, $df = 7$, $p < 0.001$) show that variation across classes still exists for students' sense of connectedness after sampling errors were removed. However, the value of χ^2 was dramatically reduced from $\chi^2 = 233.20$ to $\chi^2 = 46.69$. Furthermore, when calculating the random effects, the fully

conditional model explained an improvement of 0.67 over the unconditional model. The proportion of variation explained by level 2 variables is based on equation 6:

$$R^2 = \tau\ (ucond) - \tau\ (cond) / \tau\ (ucond) = 0.06 - 0.02 / 0.06 = .67 \quad (6)$$

In other words, 67% of student sense of connectedness can be explained by adding level 2 variables. This is a good indication that class-level variables responsible for the variation in student sense of connectedness were identified.

Learning

All level one variables were included in the unconditional model: gender, repeat instructor, campus living, sophomore, junior, and senior. Results of the level 1 partially conditional model for learning are shown in Table 15. Presented in structural format, the Level 1 partially conditional model is shown in equation 7:

$$LEARN_{ij} = \beta_{0j} + \beta_{1j}*(GENDER_{ij}) + \beta_{2j}*(REPEAT_{ij}) + \beta_{3j}*(LIVES\_ON\_CAMPUS_{ij}) + \beta_{4j}*(SOPHOMORE_{ij}) + \beta_{5j}*(JUNIOR_{ij}) + \beta_{6j}*(SENIOR) + r_{ij} \quad (7)$$

On average, Repeat Instructor was significantly and positively related to student sense of learning ($\gamma = 0.12$, $p = 0.005$) with a small effect size (effect size = 0.18). This result indicates that students who had instructors before taking the class reported 0.12 higher scores on measures of learning than students who had not had the instructor previously. Junior ($\gamma = -0.10$, $p = 0.02$) and senior status ($\gamma = -0.21$, $p < 0.001$) both had significantly negative, small and moderate effects on learning compared with freshmen (effect sizes, .18 and .38 respectively). Juniors reported .10 lower scores on measures of learning than freshman, and seniors reported .21 lower scores. Taken as a whole, these findings indicate that student-level variables accounted for approximately 4% of the

within-class variance in connectedness in classes. This was determined by calculating the effect size using equation 8.

$$R^2 = \sigma^2 \text{ (uncond)} - (\sigma^2 \text{ (cond)} / \sigma^2 \text{ (uncond)}) = 0.24 - (0.23 / 0.24) = 0.04 \quad (8)$$

Table 15

Hierarchical Linear Modeling Results of the Partially Conditional Model (Level 1) for Learning

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Student-level variable				
Intercept	2.82	0.04	62.91	<0.001*
Gender	0.06	0.03	1.90	0.06
Repeat Instructor	0.12	0.04	3.03	0.005*
Campus Living	-0.08	0.04	-1.76	0.09
Sophomore	<0.001	0.04	0.007	0.99
Junior	-0.10	0.04	-2.44	0.02*
Senior	-0.21	0.05	-4.44	<0.001*

* $p < 0.05$

Next, level 2 predictor variables (instructor characteristics, instructional methods, and instructors' SoC) were included into the level 1 partially conditional model to determine variables responsible for the variation in students' sense of learning between classes. The fully conditional model included all the level 1 variables and the following level 2 variables: instructor gender, years teaching, the 5 factor PIPS, instructor connectedness and learning, hard/pure, and soft/pure. The 5 factor PIPS was included into the model because it yielded stronger effect sizes than the 2 factor PIPS. Instructor sense of Learning and Connectedness were included over the Total Classroom

Community construct since Connectedness had a greater effect size over Total Classroom Community. The fully conditional model for Learning is shown in equation 9:

$$LEARN = \gamma_{00} + \gamma_{01}*(GENDER\_I_j) + \gamma_{02}*(YRS\_TEACH_j) + \gamma_{03}*(F1_j) + \gamma_{04}*(F2_j) + \gamma_{05}*(F3) + \gamma_{06}*(F4) + \gamma_{07}*(F5) + \gamma_{08}*(CONNECT\_I_j) + \gamma_{09}*(LEARN\_I_j) + \gamma_{010}*(HARDPURE_j) + \gamma_{011}*(SOFTPURE_j) + \gamma_{10}*(GENDER\_S) + \gamma_{20}*(REPEAT) + \gamma_{30}*(LIVES\_ON\_CAMPUS) + \gamma_{40}*(SOPHOMORE) + \gamma_{50}*(JUNIOR) + \gamma_{60}*(SENIOR) + u_{0j} + u_{1j}*(GENDER\_S_{ij}) + u_{2j}*(REPEAT_{ij}) + u_{3j}*(LIVES\_ON\_CAMPUS_{ij}) + u_{4j}*(SOPHOMORE_{ij}) + + u_{5j}*(JUNIOR_{ij}) + u_{6j}*(SENIOR_{ij}) + r_{ij} \quad (9)$$

See Table 16 for the results of the fully conditional model for Learning. The descriptions following the table explain the results of the fully conditional model based on each research question.

Table 16

Hierarchical Linear Modeling (HLM) Results of the Fully Conditional Model for Learning

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Intercept	2.82	0.03	87.07	<0.001*
Student-level variable				
Gender (student)	0.06	0.03	1.90	0.07
Repeat Instructor	0.12	0.04	2.94	0.006*
Campus Living	-0.08	0.04	-1.77	0.09
Sophomore	-.004	0.04	-0.12	0.91
Junior	-0.11	0.04	-2.43	0.02*
Senior	-0.20	0.04	-4.43	<0.001*
Class-level variable				
Gender (Instructor)	0.01	0.07	0.17	0.86
Years Teaching	0.003	0.005	0.64	0.53
F1: Student-Student Interactions	0.03	0.04	0.65	0.52
F2: Content Delivery	-0.16	0.06	-2.46	0.02*
F3: Formative Assessment	-0.10	0.06	-1.74	0.09

Table 16 – continued

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
F4: Student-Content Engagement	-0.09	0.06	-1.39	0.18
F5: Summative Assessment	-0.05	0.04	-1.29	0.21
Connectedness (Instructor)	0.23	0.09	2.44	0.02*
Learning (Instructor)	-0.06	0.10	-0.63	0.54
Hard/Pure	-0.04	0.09	-0.46	0.65
Soft/Pure	-0.14	0.08	-1.69	0.10
Random Effects	**Variance**	***df***	**Chi-Square**	***p***
Between-class variability (intercept)	0.43	6	90.69	<0.001*
Within-class variability (intercept)	0.23			
Proportion of variance explained improvement of fully conditional model over unconditional model	.33			

* $p < 0.05$

Instructor characteristics. The third research question asked whether instructor characteristics, instructor gender, years teaching, and discipline, had an influence on students' perceptions of SoC. None of the predictor variables for instructor characteristics were statistically significant, indicating that instructor gender, years teaching, and discipline were not associated with student sense of learning.

Instructional methods. Research question four addressed the impact of instructional methods upon students' SoC. As previously mentioned, prior to using HLM, items from the Postsecondary Instructional Practices (PIPS) were collapsed, and Cronbach's alphas were calculated. New variables were created for the Post-secondary Instructor Practices Survey (PIPS) for the two and five factor models. Table 14 provides further information about the reliability analysis for each construct.

The two and five factor PIPS were added to the fully conditional models separately to determine which contributed to the best model fit. For Learning, the five factor PIPS yielded a higher effect size and was included into the model. One of the five factors had a significantly negative, small effect on students' sense of learning. Factor 2, Content Delivery ($\gamma = -0.18$, $p < 0.001$), was negatively related to student sense of connectedness indicating that when an instructor's score on Content Delivery increased, students' perceptions of learning decreased (effect size = 0.29).

Instructor perceptions of SoC. Instructor perceptions of SoC, Connectedness, Learning, and Total Classroom Community, were also added to the fully conditional model. The fifth research question addresses the influence of instructor perceptions of SoC on students' perceptions of SoC. Instructor perceptions of Total Classroom Community was isolated in an independent analysis since it was formed as a variable by combining the Connectedness and Learning variables. Connectedness and Learning were included into the fully conditional model since Connectedness had a greater effect size than Total Classroom Community. Instructor sense of connectedness ($\gamma = 0.23$, $p = 0.02$) had a significantly positive, moderate effect size on students' sense of learning (effect size = 0.42). This result indicates that one unit increase in instructors' sense of connectedness is associated with a gain of 0.23 on students' sense of learning scores.

The results of the Chi-squared test ($\chi^2 = 90.69$, $df = 6$, $p < 0.001$) show that variation across classes still exists for students' sense of learning after sampling errors were removed. However, the value of χ^2 was reduced from $\chi^2 = 258.55$ to $\chi^2 = 90.69$ indicating that variation across classes was determined. Furthermore, when calculating the random effects, the fully conditional model explained an improvement of 0.33 over

the unconditional model. The proportion of variation explained by level 2 variables is based on equation 10:

$$R^2 = \tau\ (ucond) - (\tau\ (cond) / \tau\ (ucond)) = 0.06 - (0.04 / 0.06) = .33 \quad (10)$$

In other words, 33% of student sense of learning can be explained by adding level 2 variables. This is an indication that class-level variables responsible for the variation in student sense of learning were identified.

Total classroom community

All level one variables were included in the unconditional model: gender, repeat instructor, campus living, sophomore, junior, and senior. Results of the level 1 partially conditional model are shown in Table 17. Presented in structural format, the Level 1 partially conditional model is shown in equation 11:

$$TOTAL_{ij} = \beta_{0j} + \beta_{1j}*(GENDER_{ij}) + \beta_{2j}*(REPEAT_{ij}) + \beta_{3j}*(LIVES\_ON\_CAMPUS_{ij}) + \beta_{4j}*(SOPHOMORE_{ij}) + \beta_{5j}*(JUNIOR_{ij}) + \beta_{6j}*(SENIOR) + r_{ij} \quad (11)$$

Repeat Instructor was significantly and positively related to student sense of connectedness ($\gamma = 0.12$, $p = 0.002$) with a small effect size (effect size = .24). This result indicates that students who had instructors prior to taking the class reported 0.12 higher scores on measures of connectedness. Junior status ($\gamma = -0.12$, $p = 0.01$) and senior status ($\gamma = -0.24$, $p < 0.001$) both had a significantly negative, small and moderate effects on total classroom community compared with freshmen (effect sizes; .24 and .49 respectively). These results indicate that juniors and seniors reported .12 and .26 lower scores on measures of connectedness than freshman. Taken as a whole, these findings indicate that student-level variables accounted for approximately 5% of the within-class

variance in connectedness in classes. This was determined by calculating the effect size using equation 12.

$$R^2 = \sigma^2 \text{ (uncond)} - (\sigma^2 \text{ (cond)} / \sigma^2 \text{ (uncond)}) = 0.19 - (0.18 / 0.19) = 0.05 \quad (12)$$

Table 17

Hierarchical Linear Modeling Results of the Partially Conditional Model (Level 1) for Total Classroom Community

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Student-level variable				
Intercept	2.65	0.04	66.98	<0.001*
Gender	0.06	0.03	1.94	0.06
Repeat Instructor	0.12	0.03	3.44	0.002*
Campus Living	-0.05	0.05	-1.20	0.24
Sophomore	-0.04	0.04	-1.01	0.32
Junior	-0.12	0.04	-2.69	0.01*
Senior	-0.24	0.04	-5.66	<0.001*

* $p < 0.05$

Next, level 2 predictor variables (instructor characteristics, instructional methods, and instructors' SoC) were included into the level 1 partially conditional model to determine variables responsible for the variation in students' sense of total classroom community between classes. The fully conditional model included all the level 1 variables and the following level 2 variables: instructor gender, years teaching, the 5 factor PIPS, instructor total classroom community, hard/pure, and soft/pure. The 5 factor PIPS was included into the model for Connectedness because it yielded stronger effect sizes than the 2 factor PIPS. Instructor sense of Total Classroom Community was included over the Learning and Connectedness constructs since Total Classroom

Community had a greater effect size. The fully conditional model is shown in equation 13:

$$TOTAL = \gamma_{00} + \gamma_{01}*(GENDER\_I_j) + \gamma_{02}*(YRS\_TEACH_j) + \gamma_{03}*(F1_j) + \gamma_{04}*(F2_j) + \gamma_{05}*(F3) + \gamma_{06}*(F4) + \gamma_{07}*(F5) + \gamma_{08}*(TOTAL\_INSTRUCTOR_j) + \gamma_{09}*(HARDPURE_j) + \gamma_{010}*(SOFTPURE_j) + \gamma_{10}*(GENDER\_S) + \gamma_{20}*(REPEAT) + \gamma_{30}*(LIVES\_ON\_CAMPUS) + \gamma_{40}*(SOPHOMORE) + \gamma_{50}*(JUNIOR) + \gamma_{60}*(SENIOR) + u_{0j} + u_{1j}*(GENDER\_S_{ij}) + u_{2j}*(REPEAT_{ij}) + u_{3j}*(LIVES\_ON\_CAMPUS_{ij}) + u_{4j}*(SOPHOMORE_{ij}) + u_{5j}*(JUNIOR_{ij}) + u_{6j}*(SENIOR_{ij}) + r_{ij} \quad (13)$$

See Table 18 for the results of the fully conditional model for Total Classroom Community. The descriptions following the table explain the results of the fully conditional model based on each research question.

Table 18

Hierarchical Linear Modeling (HLM) Results of the Fully Conditional Model for Total Classroom Community

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Intercept	2.66	0.02	114.50	<0.001*
Student-level variable				
Gender (student)	0.06	0.03	1.74	0.09
Repeat Instructor	0.10	0.05	1.94	0.06
Campus Living	-0.03	0.05	-0.52	0.60
Sophomore	-0.06	0.05	-1.26	0.22
Junior	-0.11	0.06	-1.89	0.06
Senior	-0.26	0.06	-4.08	<0.001*
Class-level variable				
Gender (Instructor)	0.07	0.05	1.47	0.15
Years Teaching	0.003	0.003	0.89	0.38
F1: Student-Student Interactions	0.05	0.03	2.14	0.04*
F2: Content Delivery	-0.17	0.04	-3.75	<0.001*
F3: Formative Assessment	-0.05	0.04	-1.28	0.21
F4: Student-Content Engagement	-0.16	0.05	-3.35	0.003*
F5: Summative Assessment	-0.03	0.02	-1.46	0.16

Table 18 – continued

Fixed Effects	Coefficient	*SE*	T-Ratio	*p*
Class-level variable				
Total Classroom Community (Instructor)	0.26	0.05	5.54	<0.001*
Hard/Pure	-0.08	0.06	-1.22	0.23
Soft/Pure	-0.14	0.06	-2.31	0.03*
Random Effects	**Variance**	***df***	**Chi-Square**	***p***
Between-class variability (intercept)	0.02	7	54.90	<0.001*
Within-class variability (intercept)	0.18			
Proportion of variance explained improvement of conditional model over unconditional model	0.60			

* $p < 0.05$

Instructor characteristics. The third research question asked whether instructor characteristics, instructor gender, years teaching, and discipline, had an influence on students' perceptions of SoC. None of the predictor variables for instructor characteristics had a significant effect on Total Classroom Community. Therefore, instructor characteristics cannot be associated with student sense of total classroom community

Instructional methods. Research question four addressed the impact of instructional methods upon students' SoC. Prior to using HLM, items from the Postsecondary Instructional Practices (PIPS) were collapsed, and Cronbach's alphas were calculated. New variables were created for the Post-secondary Instructor Practices Survey (PIPS) for the two and five factor models. Table 14 provides further information about the reliability analysis for each construct.

The two and five factor PIPS were added to the fully conditional models separately to determine which contributed to the best model fit. For Total Classroom Community, the five factor PIPS yielded a higher effect size and was included into the

model. Two of the five factors had significantly negative, moderate effects on students' sense of total classroom connectedness. Factor 2, Content Delivery ($\gamma = -0.17$, $p < 0.001$), was negatively related to student sense of total classroom community indicating that when an instructor's score on Content Delivery increased, students' perceptions of total classroom community decreased (effect size = 0.43). Similarly, Factor 4, Student-Content Engagement ($\gamma = -0.16$, $p = 0.003$), revealed that one unit increase in Student-Content Engagement was associated with a 0.16 decrease in student sense of connectedness (effect size = .33). Factor 1, Student-Student Engagement ($\gamma = 0.05$, $p = 0.04$), however, had a significantly positive, small effect on total classroom community (effect size = 0.10). Every one increase in Student-Student Engagement was associated with a 0.05 increase in students' perceptions of total classroom community.

Instructor perceptions of SoC. Instructor perceptions of SoC, Connectedness, Learning, and Total Classroom Community, were also added to the fully conditional model. The fifth research question addresses the influence of instructor perceptions of SoC on students' perceptions of SoC. Instructor perceptions of Total Classroom Community was isolated in an independent analysis since it was formed as a variable by combining the Connectedness and Learning variables. Total Classroom Community was included into the conditional model since it had a greater impact on the effect size of the final model. Instructor Total Classroom Community ($\gamma = 0.26$, $p < 0.001$) had a significantly positive, large effect size on students' sense of connectedness (effect size = 0.53). This result indicates that one unit increase in instructors' sense of total classroom community is associated with a gain of 0.26 on students' sense of total classroom community scores.

The results of the Chi-squared test ($\chi^2 = 54.90$, $df = 7$, $p < 0.001$) show that variation across classes still exists for students' sense of total classroom community after sampling errors were removed. However, the value of χ^2 was dramatically reduced from $\chi^2 = 262.44$ to $\chi^2 = 54.90$ indicating that variation across classes was detected. Furthermore, when calculating the random effects, the fully conditional model explained an improvement of 0.60 over the unconditional model. The proportion of variation explained by level 2 variables is based on equation 14:

$$R^2 = \tau\ (ucond) - (\tau\ (cond) / \tau\ (ucond)) = 0.05 - (0.02 / 0.05) = .60 \quad (14)$$

In other words, 60% of Total Classroom Community can be explained by adding level 2 variables. This is a good indication that class-level variables responsible for the variation in student sense of total classroom community were identified.

Chapter IV Summary

Chapter IV provided a detailed analysis of the results obtained through the CCS and PIPS surveys administered to investigate students' perceptions of SoC in a traditional classroom in higher education. Frequencies, descriptive statistics, correlation, regression, and a two-level HLM were employed to address the five research questions for this study. Chapter V will explain how these results relate to the literature and offer recommendations for instructors to increase students' SoC in the traditional higher education classroom.

CHAPTER V

DISCUSSION

The aim of the present study was to determine whether student and instructor characteristics and instructional methods are predictors of student SoC. The last research question was of particular interest: To what extent, if any, do instructor perceptions of SoC influence students' perceptions of SoC? To answer the research questions, a dataset including student and instructor survey data were built and analyzed from a sample of three postsecondary institutions, 36 instructors, and 891 students in a Midwestern state. I built a series of nested models to examine the relationships between student and class level variables, including the unconditional and fully conditional models for the three student constructs for SoC: Connectedness, Learning, and Total Classroom Community. A two-level HLM model with students nested within classes was the primary statistical technique to build these models. This study has its strength in using a large sample with good power, a variety of variables at the student and class levels, and a statistical method that utilizes the nested data structure. This chapter covers key findings from the HLM analyses, implications for educators in postsecondary institutions, and recommendations for further research.

Summary of Major Results

Both student-level and class-level variables were analyzed to determine effects on students' SoC. In order to run the single level regression on student characteristics and the HLM on class level variables, I began the analysis comparing mean scores between students and instructors. The first research question of the study asks whether there is a difference between instructor and student perceptions of SoC. There were noticeable instructor and student mean differences within classes. After running independent t-tests

and ANOVAs on the complete data set, I recognized the need to investigate differences between instructor and students' perceptions of SoC further, particularly at a classroom level.

The second research question asks about the influence of student characteristics (gender, class level, campus living, repeat instructor) on students' perceptions of SoC. A single level regression was an appropriate statistical technique to determine relationships between student characteristics and student SoC. Since a single level regression is the same as running an HLM at level 1, I used the findings from the HLM to inform my conclusions for the second research question. The sections below include findings for research question two.

Even though most of the variation in student SoC lies within classes, there is sufficient variation between classes to conclude that class-level factors can impact student SoC. 18% of the total variance in student sense of connectedness lies between classes; 20% and 21% of total variation in student sense of learning and total classroom community lie between classes respectively. According to Shen et al. (2012), "research on school effects suggest that the variability at the individual level (among students or among teachers) is usually much larger than at the organizational level (among classrooms or among schools)" (p. 221). Therefore, the intraclass correlations for all three constructs of SoC are within an appropriate range to determine class-level effects. The following sections are organized according to the student SoC outcome variables: Connectedness, Learning, and Total Classroom Community, in order to discuss findings for research questions two through five.

Connectedness

The major findings from level-one of the HLM model revealed that class level has a moderate association with student sense of connectedness (with a moderate effect size). More specifically, compared with freshman, seniors have less sense of connectedness. Being a sophomore or junior did not reveal significant differences in connectedness than being a freshman.

Although the Chi-Square ($\chi^2 = 46.69$, $p < .001$) shows that there is more variance that can be explained between classes, the fully conditional model for Connectedness yielded the greatest effect size of the three outcome variables for student SoC ($R^2 = .67$). This indicates that the level-two variables included in the model for connectedness explained a large portion of the variance between classes. Instructor gender, or being a female instructor, demonstrates a significant positive association with student sense of connectedness (with a small effect size). Two of the factors from the five-factor PIPS, Content Delivery and Student-Content Engagement, were significant in the fully conditional model and revealed a moderate negative association with student sense of connectedness (with moderate effect sizes). This finding shows that students feel less connected when instructors utilize instructional practices that promote note-taking and are driven by content.

Perhaps one of the most interesting findings in this study is the strong positive association between instructor sense of total classroom community and student sense of connectedness (with a large effect size). This indicates that when an instructor has a greater sense of total classroom community, students' have a higher sense of connectedness.

Learning

Level one variables that were significant in the HLM model for Learning were Repeat Instructor and Class Level. Repeat Instructor had a small positive association with Learning, indicating that when a student has had an instructor previously, the student's sense of learning is higher. Both juniors and seniors have negative associations with Learning compared with freshmen (with small and moderate effect sizes). Seniors, in particular, have a lower sense of learning than freshmen.

Compared with the Connectedness and Total Classroom Community outcome variables, the fully conditional model for Learning had the smallest effect size ($R^2 = .33$). Therefore, the level-two variables included in the model explained 33% of the variance in Learning between classes. Two predicator variables are significant in the model: Content Delivery and Instructor Connectedness. Content Delivery demonstrates a small negative association with student sense of learning (with a small effect size), suggesting that when instructors use more instructor-centered practices such as note-taking, students' sense of learning decreases. Another interesting finding in this study is the increase in student sense of learning when an instructor has a greater sense of connectedness. The final model demonstrates a moderate association between Learning and Instructor Connectedness (with a moderate effect size).

Total Classroom Community

Only one student-level variable is significant in the level-one HLM model for Total Classroom Community. Seniors have a negative association with Total Classroom Community compared with freshmen (with a moderate effect size). Connectedness and Learning make the Total Classroom Community construct; therefore, this finding is not

surprising. Senior class level is also significantly negatively associated with freshmen status in the Connectedness and Learning final models.

Two class-level variables emerged as significant in the Total Classroom Community final model that do not appear in the other fully conditional models. Content Delivery and Student-Content Engagement are significant in the final model as well as in the previous models; however, Student-Student Engagement is significant in the Total Classroom Community model but is not significant in the Connectedness or Learning final models. Student-Student Engagement demonstrates a positive association with Total Classroom Community with a small effect size. Although this finding makes practical sense, it is still a surprise since it did not emerge in the other final models.

Another predictor variable that surfaced in the final model for Total Classroom Community is the Biglan category, Soft/Pure. The Biglan categories in the HLM models, Hard/Pure and Soft/Pure, are compared with the Soft/Applied category. Therefore, the negative association between Soft/Pure and Soft/Applied reveals that students in a Soft/Applied course, such as Education, experience a greater sense of Total Classroom Community than students in a Soft/Pure course, such as English or Philosophy.

The driving research question in this dissertation asks if instructor perceptions of SoC influence students' perceptions of SoC. Perhaps the greatest finding of this study is the strong positive association between instructor Total Classroom Community and student Total Classroom Community (effect size = .53), which reveals that when instructors' have a higher SoC, students' SoC increases.

Relationship of Results to Existing Studies

Most of the research on student SoC in postsecondary classrooms focuses on student-level variables, and there has been very little research on the impact of instructor-

level variables on students' SoC, particularly measuring instructor perceptions on SoC (Kay et al., 2011). Considering instructors' perspectives is especially important when thinking about ways perception impacts instructors' approaches to teaching and learning. According to Prosser and Trigwell (1997), "if we are to improve the quality of teaching and learning in higher education we will need to take account of the perceptions teachers have of their teaching context" (p. 25). This study contributes to the research on SoC; more specifically, it reveals new insight into instructors' perceptions of SoC and the impact instructors' perceptions may have on students' perceptions of SoC.

I found that the instructor characteristic, gender, is associated with student sense of connectedness. More specifically, students report higher measures of connectedness with female instructors. Although instructor gender has a small effect size, research from existing research supports the impact of gender on students' perceptions. According to a study conducted by Nelson Laird et al. (2011), "students perceived female instructors to be more sensitive and considerate of student ideas whereas male instructors were believed to be more knowledgeable" (p. 262). They also found that female instructors have a facilitator or delegator approach "that emphasizes relating to students as a guide, consultant, or resource as opposed to transmitting knowledge, setting goals, and providing feedback" (Nelson Laird et al., 2011, p. 262). Perhaps this finding explains why students' sense of connectedness increases with a female instructor. Basow et al. (2013) found that female faculty are ranked higher on faculty-student interactions. This also supports my finding that students have a higher sense of connectedness with female instructors.

My study concludes that instructors' perceptions of connectedness and total classroom community strongly impact students' perceptions of learning and sense of

classroom community. This finding supports the research of Kay et al. (2011) who explored professors' perceptions of classroom community through a multiple case study identifying instructors' beliefs about their role in creating classroom community. Based on interviews with 16 award-winning professors, Kay et al. (2011) concluded that there are triadic interactions in the classroom among "the affective, social/relational, and cognitive dimensions of classroom social interactions" (p. 242). The professors in the study recognized the importance of social and cognitive implications in the classroom; therefore, their perceptions had an impact on their approach to enhance social interactions in the classroom and create classroom community.

My study also finds that when an instructor has a higher sense of connectedness, an important construct of SoC, students have a higher perception of learning. Several studies support this finding. Research has shown that sense of community is associated with increased student academic achievement and motivation (Dawson, 2006; Freeman et al., 2007; Hirschy & Wilson, 2002; Rovai, 2002b; Summers & Svinicki, 2007; Tinto, 1997; Velasquez et al., 2011; Wendt & Rockinson-Szapkiw, 2015). Hirschy and Wilson (2002) found that students who reported the most beneficial class experiences were students who perceived high levels of faculty concern. Since instructor "caring" is an important part of student SoC (Summers et al., 2009), perhaps instructors with high levels of concern also have a higher sense of connectedness with their students.

Specific instructional methods reveal lower levels of students' perceptions of SoC. For example, Content Delivery, a construct of the five-factor PIPS, is negatively associated with students' SoC in all three final models: Connectedness, Learning, and Total Classroom Community. Upon further inspection of the survey items for Content Delivery, and Instructor-Centered Practice, two of the four items emphasize that students

take notes. For example, item P01 states, “I guide my students through major topics as they listen and take notes” (Walter et al., 2016, p. 5). Research supports the finding that learner-centered approaches emphasize active engagement in the learning context. Tinto (1997) states, “student learning is enhanced when students are actively involved in learning and when they are placed in situations in which they have to share learning in some positive, connected manner” (p. 601). According to Wang (2007), “Collaborative learning, based on sociocultural learning theories, provides learners with more effective learning opportunities. Students learn in a community-of-learners environment, where they act as community members” (p. 150). These findings may also explain why students’ perceptions of total classroom community in my study are slightly positively associated with the PIPS construct, Student-Student Interactions, which emphasizes a learner-centered approach.

Implications for Practice

This study contributes to educational research and provides considerations for instructional practices. First, instructor perceptions of SoC matter when considering sense of community in a postsecondary traditional classroom. Studying instructor perceptions as indicators of student SoC should inform instructional practices. According to Prosser and Trigwell (1997), “if we are to improve the quality of teaching and learning in higher education we will need to take account of the perceptions teachers have of their teaching context” (p. 25). Therefore, considering instructors’ perspectives is particularly important when thinking about how perception can influence instructors’ actions. Considering instructors’ perspectives may take a variety of forms. For example, instructors could use the PIPS to reflect on their instructional practices as a way to consider their perceptions of learning and community in the classroom. The idea of

instructors' perceptions and the impact on SoC should also impact how educators and researchers view learning in higher education. Since instructor sense of connectedness predicts student sense of learning, educators and researchers should emphasize the importance of the role of the instructor in the classroom. The instructor can impact the classroom environment and has a vital role in creating a safe space for students to learn by connecting with them.

Not only should we consider how instructors perceive SoC, we also need to help instructors recognize that classroom community is an effective instructional factor. "In order for students to have opportunities to build or experience community, college and university instructors must be willing to consider the utility of classroom community as an instructional variable" (Kay et al., 2011, p. 231). Instructors must learn the importance of classroom community and its impact on learning. "The classroom setting has the potential to become a site of community itself. As students and faculty develop relationships over time through interaction and common goals, social forces emerge that either facilitate or impede learning" (Hirschy & Wlson, 2002, p. 87). Faculty who direct Centers for Teaching and Learning or lead Faculty Development are in a unique position to promote strategies that increase classroom community. If SoC is foundational to increased student learning and motivation, faculty developers can design opportunities for instructors to learn collaborative learning strategies to bring into their own classrooms. For example, instructors could learn discussion strategies such as the Discussion Web, Think-Pair-Share, or Jigsaw Activity that increase student interaction. Faculty developers could also utilize the PIPS as a self-reflection tool to encourage faculty to consider what instructional practices they are using and why they are using those particular practices. This could launch a discussion on ways to improve note-taking

and lecture, or ways to utilize classroom discussion without wasting instructional time. Furthermore, faculty developers could successfully build SoC among instructors by modeling effective collaborative learning approaches in workshops and seminars.

Finally, university administrators should also be interested in ways faculty promote SoC in the classroom. If freshman experience a greater degree of SoC than seniors, for example, administrators should promote ways for faculty to increase SoC as a way to retain underclassmen. As a way to emphasize the value of SoC, administrators could include questions on instructor evaluations that relate specifically to SoC. Adding questions about SoC would allow administrators to determine faculty who are achieving SoC among students; those faculty could coach and help other faculty learn how to effectively build community in their classrooms.

Limitations and Recommendations for Future Research

There are limitations to this study. Generalization is a key delimitation to this study since the sample was drawn from only three institutions in a single state in the Midwest. Therefore, the sample may not be generalizable to instructors and students in institutions from other states. Also, the instructor participants were selected from institutions accessible to me. However, matching students directly with their instructors has not been included in other studies of SoC in traditional postsecondary classrooms. Therefore, this study provides an important approach to understanding the relationship between student and instructor perceptions of SoC. Furthermore, the response rates from instructors and students was very high (75.8%), which lowered the risk of non-response bias and increased the possibility that the survey results were a better representative of the target population.

Another limitation to my study is the limitation of the data. Although I ran a three-level HLM model initially, data at the institutional level did not yield enough power since only three institutions were included in the study. Additional findings at an institutional level would have informed this study. Future studies could draw from large and small institutions to determine whether the size of the institution is a predictor of student SoC. Private and public is another variable to consider when studying SoC, particularly private schools with a religious affiliation. Do students who attend schools with a religious affiliation have a stronger SoC than students who attend public schools? A longitudinal study could include Division I institutions whose basketball teams make the NCAA basketball tournament and measure students' SoC before and after March Madness to determine if institutional pride predicts student SoC in the classroom.

Students' perceptions are frequently considered in studies regarding sense of community (Frymier, 1993; Summers & Svinicki, 2007; Weaver & Qi, 2005) since students' insights contribute to understanding teaching and learning in the classroom. However, few studies have focused on instructor perspectives of SoC. Therefore, more research should focus on instructor perceptions of SoC to inform educators on effective ways to enhance SoC in the classroom. Since instructor and student participants' perceptions of SoC have not been compared in previous studies, further research could involve a more in-depth, qualitative look at reasons for student and instructor alignment of SoC as discovered in this study. Further research could also explore the impact of instructor intentions regarding SoC. For example, when instructors assess their teaching practices with an intention to increase classroom community, do those intentions have an impact on SoC in the classroom?

Another direction for research could focus on instructor characteristics such as ethnicity and background as they relate with instructor and student perceptions of SoC. When the experiences and background of the instructor are significantly different than students, do instructor and student perceptions of SoC align or misalign? Another possible instructor characteristic to explore when studying SoC is personality type. Do certain personality types promote SoC more than other types? What personality types are more likely to use student-centered instructional practices; and do those instructors have a higher perception of SoC?

I would also like to suggest further research on student SES and ethnicity in relation to student perceptions of SoC. As mentioned in Chapter II, more students are entering colleges and universities, and the students who are entering reflect a more diverse population. Hirschy and Wilson (2002) suggest that "a nonhierarchical mutually supportive classroom dynamic that supports differences" (p. 95) should include good practices that benefit students from a variety of backgrounds. Therefore, future research could explore diverse groups of students and their perceptions of SoC in order to inform educators on best practices to support and teach students from a variety of backgrounds.

Another possibility for future research is to explore differences in class level experiences among students' perceptions of SoC. In my study, seniors have significant negative associations with SoC compared with freshmen in all three final models. Why do seniors have such a different perceived experience in the classroom community than freshmen? Do other contributing factors explain the significant difference between students who are beginning college and students near the end of college? Furthermore, why does SoC decrease as students get older, and does that decrease in SoC impact retention?

REFERENCES

Ashar, H., & Skenes, R. (1993). Can Tinto's student departure model be applied to nontraditional students? *Adult Education Quarterly, 43*(2), 90-100. doi: 10.1177/0741713693043002003

Astin, A. (1991). The changing American college student: Implications for educational policy and practice. *Higher Education, 22*(2), 129-143. URL: http://www.jstor.org/stable/3447248

Astin, A. (1993, October). *Higher education and the concept of community.* Paper presented at The Fifteenth David Dodds Henry Lectures in Higher Education, Urbana, IL.

Atkinson, M. P., Buck, A. R., & Hunt, A. N. (2009). Sociology of the college classroom: Applying sociological theory at the classroom level. *Teaching Sociology, 37*(3), 233-244.

Baker-Eveleth, L. J., Chung, Y., Daniel, M., & O'Neill, M. (2011). Developing a community of practice through learning climate, leader support and leader interaction. *American Journal of Business Education, 4*(2), 33-40.

Barczyk, C. C., & Duncan, D. G. (2013). Facebook in higher education courses: An analysis of students' attitudes, community of practice, and classroom community. *International Business and Management, 6*(1), 1(11).

Barr, R. B., & Tagg, J. (1995). Teaching to learning: A new paradigm for undergraduate Education. *Change, 27*(6), 12-25.

Basow, S. A. (2000). Best and worst professors: Gender patterns in students' choices. *Sex Roles, 43*(5/6), 407-417.

Basow, S. A., Codos, S., & Martin, J. L. (2013). The effects of professors' race and gender on student evaluations and performance. *College Student Journal, 47*(2), 352-363. Retrieved from http://libproxy.library.wmich.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ofs&AN=88413465&site=ehost-live

Basow, S. A., Phelan, J. E., & Capotosto, L. (2006). Gender patterns in college students' choices of their best and worst professors. *Psychology of Women Quarterly, 30*, 25-35.

Bergom, I., Wright, M. C., Brown, M. K., & Brooks, M. (2011). Promoting college student development through collaborative learning: A case study of "hevruta". *About Campus, 15*(6), 19-25. doi: 10.1002/abc.20044

Biglan, A. (1973). Relationships between subject matter characteristics and the structure and output of university departments. *Journal of Applied Psychology, 57*, 204-213.

Booker, K. C. (2008). The role of instructors and peers in establishing classroom community. *Journal of Instructional Psychology, 35*(1). Retrieved from http://find.galegroup.com.libproxy.library.wmich.edu/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tableD=T002&prodld=EAIM&docld=A178218782&source=gale&userGroupName=Iom_wmichu&version=1.0

Boyer, E. L. (1990, January). *In search of community.* Paper presented at the Annual Meeting of the American Council on Education, Washington DC.

Brown, J. D. (1997). Questions and answers about language testing statistics: Skewness and kurtosis. Shiken: JALT Testing and Evaluation SIG Newsletter, 1(1). Pp. 20-

23. Retrieved from http//www.jalt.org/test/bro_1.htm

Brown, R. E. (2001). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks, 5*(2), 18-35.

Brown, C. & McIlroy, K. (2011). Group work in healthcare students' education: What do we think we are doing? *Assessment & Evaluation in Higher Education, 36*(6), 687-699. doi: 10.1080/02602938.2010.483275

Budge, K. & Cowlishaw, K. (2012, November). Student and teacher perceptions of learning and teaching: A case study. *Journal of Further and Higher Education, 36*(4), 549-565. doi: 10.1080/0309877X.2011.643775

Burdett, J. (2007). Degrees of separation – balancing intervention and independence in group work assignments. *The Australian Educational Researcher, 34*(1), 55-71.

Cabrera, A. F., Crissman, J. L., Bernal, E. M., Nora, A., Terenzini, P. T., & Pascarella, E. T. (2002). Collaborative learning: Its impact on college students' development and diversity. *Journal of College Student Development, 43*(1), 20-34.

Catalano, G. D. & Catalano, K. (1999, January). Transformation: From teacher-centered to student-centered engineering education. *Journal of Engineering Education, 88*(1), 59-64. doi: 10.1002/j.2168-9830.1999.tb00412.x

Chavis, D. M., & Pretty, G. M. H., (1999). Sense of community: Advances in measurement and application. *Journal of Community Psychology, 27*(6), 635-642.

Chen, B. H., & Chiou, H. (2014). Learning style, sense of community and learning effectiveness in hybrid learning environment. *Interactive Learning Environments, 22*(4), 485-496. doi:10.1080/10494820.2012.680971

Ciani, K. D., Middleton, M. J., Summers, J. J., & Sheldon, K. M. (2010). Buffering against performance classroom goal structures: The importance of autonomy support and classroom community. *Contemporary Educational Psychology, 35*(1), 88-99.

Colbeck, C. L., Cabrera, A. F., & Marine, R. J. (2002, April). *Faculty motivation to use alternative teaching methods.* Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

Colbeck, C. L., Campbell, S. E., & Bjorklund, S. A. (2000). Grouping in the dark: What college students learn from group projects. *The Journal of Higher Education, 71*(1), 60-83. Retrieved from http://www.jstor.org/stable/2649282

Cranmer, S. (2006). Enhancing graduate employability: Best intentions and mixed outcomes. *Studies in Higher Education, 31*(2), 169-184.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

D'Andrea, V. & Gosling, D. (2005, August). *Improving teaching and learning in higher education: A critical approach*. New York, NY: McGraw-Hill Professional Publishing. Retrieved from http://site.ebrary.com.libproxy.library.wmich.edu/lib/wmichlib/detail.action?docID=10161304

Dawson, S. (2006). A study of the relationship between student communication interaction and sense of community. *Internet and Higher Education, 9*, 153-162. doi: 10.1016/j.iheduc.2006.06.007

Deale, C. S. & White, B. J. (2012). Hospitality students' and instructors' perceptions of a sense of community and learning in online classes: Do they see eye to eye? *Journal of Hospitality & Tourism Education, 24*(2-3), 5-11. doi: 10.1080/10963758.2012.10696664

Fowler, F. J. (2009). *Survey Research Methods* (4th ed.). Thousand Oaks, CA: Sage.

Freeman, T. M., Anderman, L. H., & Jensen, J. M. (2007). A sense of belonging in college freshmen at the classroom and campus levels. *The Journal of Experimental Education, 75*(3), 203-220.

Frymier, A. B. (1993, November). *The impact of teacher immediacy on students' motivation over the course of a semester*. Paper presented at the Annual Meeting of the Speech Communication Association, Miami Beach, FL.

Gale, A. J., Martin, K., & Duffey, M. A. (2014). The burnout phenomenon: A comparative study of student attitudes toward collaborative learning and sustainability. *Journal of Interior Design, 39*(1), 17-31.

Gamson, Z. F. (1994). Collaborative learning comes of age, *Change*, *46*(5), 44-49.

Gitterman, A. (2004). Interactive andragogy: Principles, methods, and skills. *Journal of Teaching in Social Work, 24*(3-4), 95-112. doi: 10.1300/J067v24n03_07

Gottschall, H. & García-Bayonas, M. (2008). Student attitudes towards group work among undergraduates in business administration, education and mathematics. *Educational Research Quarterly, 32*(1), 3-28.

Green, N. E., & Fink, L. S. (2010). Teaching (dis)abled: Reflections on teaching, learning, power, and classroom community. *English Journal, 100*(2), 86-92. Retrieved from http://partneraccess.oclc.org.libproxy.library.wmich.edu/wcpa/servlet/Search?wca

pi=1& wcpartner=proquesta&wcautho=100141360&wcissn=0013-8274&wcdoctype=ser

Harris, B. A. (2001). The power of creating a spiritual learning community. *Adult Learning, 12*(3), 22.

Hew, K. F., & Cheng, W. S. (2003). Models to evaluate online learning communities of asynchronous discussion forums. *Australian Journal of Educational Technology, 19*(2), 241-259.

Hill, J. L. (1996). Psychological sense of community: Suggestions for future research. *Journal of Community Psychology, 24*(4), 431-438.

Hirschy, A. S., & Wilson, M. E. (2002). The sociology of the classroom and its influence on student learning. *Peabody Journal of Education, 77*(3), 85-100. doi: 10.1207S15327930PJE7703_5

Hofmann, D. A. (1997). An overview of the logic and rationale of hierarchical linear models. Journal of Management, 23(6), 723-744. doi: 10.1177/014920639702300602

Johnson, D. W., & Johnson, R. T., (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher, 38*(5), 365-379. doi: 10.3102/0013189X09339057

Johnson, D. W., & Johnson, R. T., & Smith, K. A. (1991). *Cooperative learning: Increasing college faculty instructional productivity. (*ASHE-ERIC Higher Education Report No. 4). Washington, DC: The George Washington University, School of Education and Human Development.

Kay, D., Summers, J, & Svinicki, M. (2011). Conceptualizations of classroom community in higher education: Insights from award winning professors. *Journal of Ethnographic & Qualitative Research, 5*, 230-234.

Kember, D., Ho, A., & Hong, C. (2010). Characterizing a teaching and learning environment capable of motivating student learning. *Learning Environmental Research, 13,* 14-57. doi: 10.1007/s10984-009-9065-8

Kember, D., Leung, D. Y. P., & Ma, R. S. F. (2007). Characterizing learning environments capable of nurturing generic capabilities in higher education. *Research in Higher Education, 48*(5), 609-632. doi: 10.1007/s11162-006-9037-0

Keppel, G. & Wickens, T. D. (2004). *Design and analysis: A researcher's handbook* (4th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Kuh, G. (2001). Assessing what really matters to student learning inside the National Survey of Student Engagement. *Change: The Magazine of Higher Learning, 33*(3), 10-17. doi: 10.1080/00091380109601795

Maguire, S. & Edmondson, S. (2001). Student evaluation and assessment of group projects. *Journal of Geography in Higher Education, 25*(2), 209-217. doi: 10.1080/03098260120067664

McInnerney, J. M., & Roberts, T. S. (2004). Online learning: Social interaction and the creation of a sense of community. *Educational Technology & Society*, *7*(3), 73-81. Retrieved from ISSN 1436-4522 (online) and 1176-3647 (print)

McKinney, J. P., McKinney, K. G., Franiuk, R., & Schweitzer, J. (2006). The college classroom as a community: Impact on student attitudes and learning. *College Teaching*, *54*(3), 281- 284.

McMillan, D. W. (1996). Sense of community. *Journal of Community Psychology*, *24*(4), 315-325.

McMillan, D. W., & Chavis, D. (1986). Sense of community: A definition and theory. *Journal of Community Psychology, 14*(1), 6-23.

Modell, H. I., DeMiero, F. G., & Rose, L. (2009). In pursuit of a holistic learning environment: The impact of music in the medical physiology classroom. *Advances in Physiology Education, 33*, 37-45. doi: 10.1152/advan.90149.2008.

Muffo, J. A. & Langston IV, I. W. (1981). Biglan's dimensions: Are the perceptions empirically based? *Research in Higher Education, 15*(2), 141-159.

Nelson Laird, T. F., Garver, A. K., & Niskodé-Dossett, A. S. (2011). Gender gaps in collegiate teaching style: Variations by course characteristics. *Research in Higher Education, 52*, 261-277. doi: 10.1007/s11162-010-9193-0

Nelson Laird, T. F., McCormick, A. C., & Chamberlain, T. A. (2008). Effective educational practices and essential learning outcomes in general education courses: Differences by discipline. *AAC&U 2008 Integrative Designs for General Education and Assessment*, 4–7. Boston, MA: Association of American Colleges and Universities

New Detroit: The Coalition. (2003). *A progress report: School improvement in the Detroit Public Schools*. East Lansing, MI: Michigan State University Urban Programs and the Department of Family and Child Ecology. Retrieved from http://www.newdetroit.org/docs/yd/DPS_Progress_Report_Oct2003.pdf

Nixon, D. H., Marcelle-Coney, D., Torres-Greggory, M., Huntley, E., Jacques, C., Pasquet, M., & Ravachi, R. (2010). Creating community: Offering a liberation pedagogical model to facilitate diversity conversations in MFT graduate

classrooms. *Journal of Marital and Family Therapy*, *36*(2), 197-211. Retrieved from http://partneraccess.oclc.org.libproxy.library.wmich.edu/wcpa/servlet/Search?wcapi=1& wcpartner=proquesta&wcautho+100141360&wcissn=0194-472X&wcdoctype=ser

Perkins, D. D., Florin, P., Rich, R. C., Wandersman, A., & Chavis, D. (1990). Participation and the social and physical environment of residential blocks: Crime and community context. *American Journal of Community Psychology*, *24*, 83-115.

Perumal, J. (2008). Student resistance and teacher authority: The demands and dynamics of collaborative learning. *Journal of Curriculum Studies, 40*(3), 381-398. doi:10.1080/00220270701724570

Pike, G. R., Kuh, G. D., & McCormick, A. C. (2011). An investigation of the contingent relationships between learning community participation and student engagement. *Research in Higher Education, 52*(3), 300-322. doi: 10.1007/s11162-010-9192-1

Prosser, M. & Trigwell, K. (1997). Relations between perceptions of the teaching environment and approaches to teaching. *British Journal of Educational Psychology, 67*, 25-35

Prosser, M. & Trigwell, K. (2014, June). Qualitative variation in approaches to university teaching and learning in large first-year classes. *Higher Education*, *67*(6), 783-795. doi: 10.1007/s10734-013-9690-0

Raudenbush, S., Bryk, A., Cheong, Y. F., Congdon, R., & du Toit, M. (2011). *HLM7: Linear and Nonlinear Modeling.* Lincolnwood, IL: Scientific Software International, Inc.

Response Rates. (n.d.). Retrieved from http://facultyinnovate.utexas.edu/sites/default/files/response_rates.pdf

Ritter, C., Polnick, B., Fink II, R., & Oescher, J. (2010). Classroom learning communities in educational leadership: A comparison study of three delivery options. *Internet and Higher Education, 13*, 96-100. doi: 10.1016/j.iheduc.2009.11.005

Robinson, C. F., & Kakela, P. J. (2006). Creating a space to learn: A classroom of fun, interaction, and trust. *College Teaching, 54*(1), 202-206.

Rosenthal, R., & Rosnow, R. L. (1984). Essentials of behavioral research: Methods and data analysis. New York, NY: McGraw-Hill.

Rovia, A. P. (2001). Building classroom community at a distance: A case study. *Educational Technology Research and Development Journal, 49*(4), 39-50.

Rovia, A. P. (2002a). Development of an instrument to measure classroom community. *Internet and Higher Education, 5*, 197-211.

Rovai, A. P. (2002b). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *Internet and Higher Education, 5*, 319-332.

Rovai, A. P. & Jordan, H. (2004). Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Review of Research in Open and Distance Learning, 5*(2), 1-13.

Rovai, A. P., & Wighting, M. J. (2005). Feelings of alienation and community among higher education students in a virtual classroom. *Internet and Higher Education, 8*, 97-110. doi: 10.1016/j.iheduc.2005.03.001

Rovai, A. P., & Gallien, L. B. (2005). Learning and sense of community: A comparative analysis of African american and caucasian online graduate students. *The Journal of Negro Education, 74*(1), 53-62.

Rovai, A. P., Gallien, L. B., & Wighting, M. J. (2005). Cultural and interpersonal factors affecting African american academic performance in higher education: A review and synthesis of the research literature. *Journal of Negro Education, 74*(4), 359-370.

Rovai, A. P., Wighting, M. J., & Lucking, R. (2004). The classroom and school community inventory: Development, refinement, and validation of a self-report measure for educational research. *The Internet and Higher Education, 7*(4), 263-280. doi:10.1016/j.iheduc.2004.09.001

Smith, K. A. (2011, October). *Cooperative learning: Lessons and insights from thirty years of championing a research-based innovative practice.* Paper presented at the 41st ASEE/IEEE Frontiers in Education Conference, Rapid City, SD.

Solimeno, A., Mebane, M. E., Tomai, M., & Francescato, D. (2008). The influence of students and teachers characteristics on the efficacy of face-to-face and computer supported collaborative learning. *Computers & Education, 51*(1), 109-128. doi: 10.1016/j.compedu.2007.04.003

Stes, A., De Maeyer, S., Gijbels, D., & Van Petegem, P. (2012). Instructional development for teachers in higher education: Effects on students' perceptions of the teaching-learning environment. *British Journal of Educational Psychology, 82*, 398-419. doi: 10.1111/j.2044-8279.2011.02032.x

Summers, J. J., Bergin, D. A., & Cole, J. S. (2009). Examining the relationships among collaborative learning, autonomy support, and student incivility in undergraduate classrooms. *Learning and Individual Differences, 19*(2), 293-298. doi: 10.1016/j.lindif.2008.09.006

Summers, J. J., Beretvas, S. N., Sviniscki, M. D., & Gorin, J. S. (2005). Evaluating collaborative learning and community. *The Journal of Experimental Education, 73*(3), 165-188.

Summers, J. J., & Sviniscki, M. D. (2007). Investigating classroom community in higher education. *Learning and Individual Differences, 17*, 55-67. doi:10.1016/j.lindif.2007.01.006

Talò, C., Mannarini, T., & Rochira, A. (2014). Sense of community and community participation: A meta-analytic review. *Social Indicators Research, 117*(1), 1-28. doi: 10.1007/s11205-013-0347-2

Tanner, D. (2012). *Using statistics to make educational decisions.* Los Angeles, CA: SAGE Publications, Inc.

Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. *The Journal of Higher Education, 68*(6), 599-623. Retrieved from http://www.jstor.org/stable/2959965

Trigwell, K. & Prosser, M. (1991, October). Improving the quality of student learning: The influence of learning context and student approaches to learning on learning outcomes. *Higher Education, 22*(3), 251-266. Retrieved from http://www.jstor.org/stable/3447175

Trigwell, K., Prosser, M., & Waterhouse, F. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education, 37*, 57-70.

Umbach, P. D., & Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education, 46*(2), 153-184. doi: 10.1007/s11162-004-1598-1

Vaccaro, A., Daly-Cano, M., & Newman, B. M. (2015). A sense of belonging among college students with disabilities: An emergent theoretical model. *Journal of College Student Development, 55*(7), 670-686. doi: 10.1353/csd.2015.0072

Van den Bossche, P., Gijselaers, W. H., Segers, M., & Kirschner, P. A. (2006). Social and cognitive factors driving teamwork in collaborative learning environments: Team learning beliefs and behaviors. *Small Group Research, 37,* 490-521. doi:10.1177/1046496406292938

VanderStaay, S. L., Faxon, B. A., Meishchen, J. E., Kolesnikov, K. T., & Ruppel, A. D. (2009). Close to the heart: Teacher authority in a classroom community. *College Composition and Communication, 61*(2), W262-W282. Retrieved from http://partneraccess.oclc.org.libproxy.library.wmich.edu/wcpa/servlet/Search?wcapi=1&wcpartner=proquesta&wcautho=1001413608&wcissn=0010-096X&wcdoctype=ser

van Teijlingen, E. R. & Hundley, V. (2001). The importance of pilot studies. *Social Research Update, 35*.

Velasquez, N. F., Wilkerson, J. W., & Misch, M. B. (2011). Using "off-topic" presentations to engage students and create a sense of community in the classroom. *Journal of Applied Research in Higher Education, 3*(2), 97-106. doi: 10.1108/17581181111198647

Ventimiglia, L. M. (1994). Cooperative learning at the college level. *Thought and Action, 9*(2), 5-30.

Vogt, C. M., Hocevar, D., & Hagedorn, L. S. (2007, May/June). A social cognitive construct validation: Determining women's and men's success in engineering programs. *The Journal of Higher Education, 78*(3), 337-364. doi: 10.1353/jhe.2007.0019

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Walker, A. J. (1996, July). Cooperative learning in the college classroom. *Family Relations, 45*(3), 327-335. Retrieved from http://www.jstor.org/stable/585505

Walker, G. B., Daniels, S. E., & Emborg, J. (2008, October). Tackling the tangle of environmental conflict: Complexity, controversy, and collaborative learning. *Emergence: Complexity and Organization, 10*(4), 17-27.

Walter, E., Beach, A., Henderson, C., & Williams, C. (2014, October). *Describing instructional practice and climate: Two new instruments.* Paper presented at the Transforming Institutions: 21st Century Undergraduate STEM Education Conference, Indianapolis, IN.

Walter, E., Henderson, C., Beach, A., & Williams, C. (2016, Winter). Introducing the postsecondary instructional practices survey (PIPS): A concise, interdisciplinary, and easy-to-score survey. *CBE – Life Sciences Education, 15*(53), pp. 1-11.

Wang, L. (2007). Sociocultural learning theories and information literacy teaching activities in higher education. *Reference & User Services Quarterly*, *47*(2), 149-158. Retrieved from http://partneraccess.oclc.org.libproxy.library.wmich.edu/wcpa/servlet/Search?wcapi=1&wcpartner=proquesta&wcautho=100141360&wcissn=1094-9054&wcdoctype=ser

Weaver, R. R., & Qi, J. (2005). Classroom organization and participation: College students' perceptions. *The Journal of Higher Education, 76*(5), 570-601. doi: 10.1353/jhe.2005.0038

Wendt, J. L., & Rockinson-Szapkiw, A. J. (2015). The effect of online collaboration on adolescent sense of community in eighth-grade physical science. *Journal of Science Education and Technology, 24*(5), 671-683. doi: 10.1007/s10956-051-9556-6

Woltman, H., Feldstain, A., MacKay, J. C., & Rocchi, M. (2012). An introduction to hierarchical linear modeling. *Tutorials in Quantitative Methods for Psychology*, *8(1),* 52-69. doi: 10.20982/tqmp.08.1.p052

Appendix A

Email to Potential Participants

Hello _____,

I hope you are doing well and enjoying teaching at ____. I began as the division chair this year and am working on my dissertation - life is busy but good.

I am emailing to find out if you would be willing to let me come to your classroom in March or April to let me give a short, 20 question questionnaire to your students. I would only need 15 minutes of class time to explain the study, review the consent form, and give the survey. There is also a questionnaire for instructors that includes 44 questions, but that can be taken on your own time.

This study will examine the interaction of student and instructor variables about teaching and learning. I thought of you because you have a good rapport with students and do an especially good job of engaging them in learning.

I may also email Matt (last name) to see if I could come to his classroom, but I thought I'd start with you.

--
Laurie Burgess | Division Chair
Assistant Professor of Teacher Education

Cornerstone University
1001 E. Beltline Ave. NE
laurie.burgess@cornerstone.edu
616.949.5300 ext. 1949

Appendix B

Permission to use Instruments

Subject Line: Permission to use modified CCS

Hi Laurie

What an interesting dissertation topic area.

You are free to cite our paper (we're glad you found it useful for your dissertation).

We (my coauthor, Dr. Deale) actually got permission from the author of the full scale (Dr. Alfred Rovai (alfrrov@regent.edu) to use the modified scale you see in our paper.

Please research his full scale and contact him for permission to use the modified scale too. He will also be very interested in your dissertation topic I'm sure!

Again, good luck with your work in this important area!

Barbara Jo

Barbara Jo White, PhD
Associate Professor of Information Systems
Department of Acct., Fin., Info Sys., and Econ.
College of Business, Western Carolina University
whiteb@email.wcu.edu; 828-227-7193

Subject Line: Permission to use modified CCS

Hi Laurie.

I echo Barbara Jo's comments.

I agree that this is an interesting dissertation topic area.

As Barbara Jo noted, you are free to cite our paper (and yes--we are glad you found it useful for your own dissertation).

And do note that we received permission from the author of the full scale (Dr. Alfred Rovai (alfrrov@regent.edu) to use the modified scale you saw in our paper.

Please see his research on his full scale and contact him for permission to use the modified scale, too.

Thanks for reaching out to us and best wishes to you on an interesting, meaningful dissertation.

Best regards,

Cynthia

P.S. I think you need the following article--plus see the reference list in our article

Rovai, A. P. (2002). Development of an instrument to measure classroom community. Internet and Higher Education, 5, 197−211. (ERIC Document Reproduction Service No. EJ663068) Available online at http://dx.doi. org/10.1016/S1096-7516(02)00102-1

Cynthia S. Deale, Ph.D.
Professor
School of Hospitality Leadership
College of Business
East Carolina University
Mail: C/0 Rivers 148, Mailstop 505
Office: 313W Rivers
Greenville, North Carolina U.S.A. 27858
ohalloranc@ecu.edu
252-737-4195/cell: 828-550-0341

Subject Line: Instructors' Perceptions of Sense of Community Question

Good afternoon,

You have permission to use the CCS for your research. Make sure you cite the Internet & Higher Education as the source document.

Best wishes,

Fred Rovai

www.alfredrovai.com

Appendix C

Classroom Community Scale for Students

Student Questionnaire

☐ **By checking this box, I agree to participate in this study. My questions have been answered to my satisfaction, and I have been given a copy of the consent form.**

Thank you for taking part in this study. The information collected from this survey will be used solely by the researcher. Any published findings will be anonymous and participants' confidentiality will be protected.

Student Information

1. Gender - Please select only one of the following:
   - Male
   - Female

2. Class Level - Please select only one of the following:
   - Freshman
   - Sophomore
   - Junior
   - Senior
   - Other: _____

3. Have you ever taken a course with this instructor before?
   - Yes
   - No

4. Do you live on campus or commute?
   - Live on campus
   - Commute

Instructions: Please read each statement carefully and check the circle that comes closest to matching your feelings regarding the course you are currently taking. There are no correct or incorrect responses. Please respond to all statements. The survey should take about five minutes to take.

1. **I feel that students in this course care about each other.**
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

2. I feel that I am encouraged to ask questions.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

3. I feel connected to others in this course.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

4. I feel that it is hard to get help when I have a question.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

5. I do not feel a spirit of community.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

6. I feel that I receive timely feedback.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

7. I feel that this course is like a family.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

8. **I feel uneasy exposing gaps in my understanding.**
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

9. **I feel isolated in this course.**
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

10. **I feel reluctant to speak openly.**
    - Strongly agree
    - Agree
    - Neutral
    - Disagree
    - Strongly disagree

11. **I trust others in this course.**
    - Strongly agree
    - Agree
    - Neutral
    - Disagree
    - Strongly disagree

12. **I feel that this course results in only modest learning.**
    - Strongly agree
    - Agree
    - Neutral
    - Disagree
    - Strongly disagree

13. **I feel that I can rely on others in this course.**
    - Strongly agree
    - Agree
    - Neutral
    - Disagree
    - Strongly disagree

14. I feel that other students do not help me learn.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

15. I feel that members of this course depend on me.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

16. I feel that I am given ample opportunities to learn.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

17. I feel uncertain about others in this course.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

18. I feel that my educational needs are not being met.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

19. I feel confident that others will support me.
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

20. I feel that this course does not promote a desire to learn.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Please comment on any of the questions above and offer explanations:

Appendix D

Classroom Community Scale and Postsecondary Instructional Practices Survey for Instructors

Instructor Questionnaire

☐ **By checking this box, I agree to participate in this study. My questions have been answered to my satisfaction, and I have been given a copy of the consent form.**

Thank you for taking part in this study. The information collected from this survey will be used solely by the researcher. Any published findings will be anonymous and participants' confidentiality will be protected.

Instructor Information

1. Course Title: _____

2. Number of students enrolled in this course: _____

3. Gender**:** _____

4. Number of years you have been teaching: _____

Instructions: Please read each statement carefully and check the circle that comes closest to matching your feelings regarding the course you are currently teaching. There are no correct or incorrect responses. Please respond to all statements.

1. **I feel that students in this course care about each other.**
   - o Strongly agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly disagree

2. **Students feel encouraged to ask questions.**
   - o Strongly agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly disagree

3. **I feel connected to students in this course.**
   - o Strongly agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly disagree

4. **I feel that it is easy for students to get help from me when they have questions.**
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

5. **I do not feel a spirit of community.**
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

6. **I feel that I give students timely feedback.**
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

7. **I feel that this course is like a family.**
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

8. **Students feel uneasy exposing gaps in their understanding.**
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

9. **Students feel isolated in this course.**
- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

10. Students feel reluctant to speak openly.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

11. Members trust each other in this course.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

12. Students feel that this course results in only modest learning.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

13. Members feel that they can rely on others in this course.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

14. The students feel that other students do not help them learn.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

15. I feel that members of this course depend on me.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

16. **Students are given ample opportunities to learn.**
- o Strongly agree
- o Agree
- o Neutral
- o Disagree
- o Strongly disagree

17. **Students feel uncertain about others in this course.**
- o Strongly agree
- o Agree
- o Neutral
- o Disagree
- o Strongly disagree

18. **I think that students feel their educational needs are being met.**
- o Strongly agree
- o Agree
- o Neutral
- o Disagree
- o Strongly disagree

19. **Students feel confident that others will support them.**
- o Strongly agree
- o Agree
- o Neutral
- o Disagree
- o Strongly disagree

20. **I think students feel that this course promotes a desire to learn.**
- o Strongly agree
- o Agree
- o Neutral
- o Disagree
- o Strongly disagree

Please comment on any of the questions above and offer explanations:

Instructions: Please read each statement and then indicate the degree to which the statement is descriptive of your teaching. There are no correct or incorrect answers. The purpose of the survey is to understand how you teach, not to evaluate your teaching.

	Not at all descriptive of my teaching	Minimally descriptive of my teaching	Somewhat descriptive of my teaching	Mostly descriptive of my teaching	Very descriptive of my teaching
1. I guide students through major topics as they listen and take notes.	0	1	2	3	4
2. I design activities that connect course content to my students' lives and future work.	0	1	2	3	4
3. My syllabus contains the specific topics that will be covered in every class session.	0	1	2	3	4
4. I provide students with immediate feedback on their work during class (e.g., student response systems, short quizzes).	0	1	2	3	4
5. I structure my course with the assumption that most of the students have little useful knowledge of the topics.	0	1	2	3	4
6. I use student assessment results to guide the direction of my instruction during the semester.	0	1	2	3	4
7. I ask my students to respond to questions during class time.	0	1	2	3	4
8. I use student questions and comments to determine the focus and direction of classroom discussion.	0	1	2	3	4

9. I have students use a variety of means (models, drawings, graphs, symbols, simulations, etc.) to represent phenomena.	0	1	2	3	4
10. I structure class so that students explore or discuss their understanding of new concepts before formal instruction.	0	1	2	3	4
11. My class sessions are structured to give students a good set of notes.	0	1	2	3	4
12. I structure class so that students regularly talk with one another about course concepts.	0	1	2	3	4
13. I structure class so that students constructively criticize one another's ideas.	0	1	2	3	4
14. I structure class so that students discuss the difficulties they have with this subject with other students.	0	1	2	3	4
15. I require students to work together in small groups.	0	1	2	3	4
16. I structure problems so that students consider multiple approaches to finding a solution.	0	1	2	3	4
17. I provide time for students to reflect about the processes they use to solve problems.	0	1	2	3	4
18. I give students frequent assignments worth a small portion of their grade.	0	1	2	3	4

19. I require students to make connections between related ideas or concepts when completing assignments.	0	1	2	3	4
20. I provide feedback on student assignments without assigning a formal grade.	0	1	2	3	4
21. My test questions focus on important facts and definitions from the course.	0	1	2	3	4
22. My test questions require student to apply course concepts to unfamiliar situations.	0	1	2	3	4
23. My test questions contain well-defined problems with one correct solution.	0	1	2	3	4
24. I use a grading curve as needed to adjust student scores.	0	1	2	3	4

Please comment on any of the statements above and offer explanations:

Appendix E

Approval Letters from the Human Subjects IRB

CU-IRB Approval Request Form:
Research with Human or Animal Participants

Approved CU-IRB Date: 10/19/16

Title of Research: SENSE OF COMMUNITY IN POSTSECONDARY TRADITIONAL CLASSROOMS: HOW INSTRUCTOR PERCEPTIONS IMPACT STUDENT PERCEPTIONS

Date research will begin: October 2016 Expected completion date: November 2016

If proposal for external funding: None

Agency: _____ Deadline: _____

Department chair's signature, acknowledging awareness of study: Sharon Kruse

CU-IRB training is required of all investigators prior to review of the CU-IRB Approval Request Form.

All investigators, including advisor, students, and non-faculty staff, are required to complete IRB training. Training is available at http://ohrp-ed.od.nih.gov/CBTs/Assurance/login.asp After login, read each page and click "continue" until you reach the Table of Contents. Choose Module 2. Once training is completed you will receive a certificate and it must be forward to the CU-IRB Chair.

X All investigators have completed required CU-IRB training and a copy of the certificate is sent to Director of Institutional Research.

Name of Investigator(s): Laurie Burgess Department: Teacher Education at Cornerstone University

☐ Student ☑ Faculty ☐ Other _____.

Phone: (616)780-7007 Date: 9/30/16 Email: laurie.k.burgess@wmich.edu

FOR RESEARCH CONDUCTED BY STUDENTS OR NON-FACULTY STAFF: This research involving human or animal participants, if approved, will be under the direct supervision of the following faculty advisor (considered the principle investigator):

Faculty Advisor: Andrea Beach, Ph.D., Chair

Department: Education Leadership, Research, Technology at Western Michigan University

Phone: (269)387-1725 Date: 9/30/16 Email: andrea.beach@wmich.edu

x Human Subjects Research Animal Research (Also Complete Question10)

Department of Sociology and Social Work

Spoelhof Center
3201 Burton St SE
Grand Rapids, MI 49546-4388

Calvin COLLEGE 1876

March 9, 2017

Laurie Burgess
Educational Leadership
Western Michigan University

Dear Laurie,

Your proposal for your project "Sense of community in post-secondary traditional classrooms: How instructor perceptions impact student perceptions" has been reviewed. The Calvin College Institutional Review Board has approved the proposal. It is document number 17-008. Please refer to this number in all future correspondence.

All research for this study must be conducted according to the proposal that was approved by the IRB. Any modification of this research project as described in the proposal must be submitted to the IRB for review and approval prior to implementation.

The approval is good for one year. Federal regulations require that ongoing research must be reviewed by the IRB at least once a year. A request for renewal must be submitted if the project will continue past that date.

Please retain a copy of your NIH certificate demonstrating that you have completed the web-based course "Protecting Human Research Participants." This certificate is valid for three years.

Best wishes as you carry out this research.

Sincerely,

Kristen R. Alford

Kristen R. Alford, PhD, LLMSW, MPH
Institutional Review Board Chair
Calvin College
Phone: 616-526-7732
E-mail: kadmir42@calvin.edu

WESTERN MICHIGAN UNIVERSITY

Human Subjects Institutional Review Board

Date: March 28, 2017

To: Andrea Beach, Principal Investigator
Laurie Burgess, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 17-01-27

This letter will serve as confirmation that the changes to your research project titled "Sense of Community in Postsecondary Traditional Classrooms: How Instructor Perceptions Impact Student Perceptions" requested in your memo received March 27, 2017 (to revise the subject recruitment to seek a minimum of 30 classes with 20 or more students in each class and to revise the number of subjects wanted to complete the study from 930 to 840-930 subjects) have been approved by the Human Subjects Institutional Review Board.

The conditions and the duration of this approval are specified in the Policies of Western Michigan University.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: **January 30, 2018**

Appendix F

Informed Consent Form

Consent Form

Title of Study: Sense of Community in Postsecondary Traditional Classrooms: How Instructor Perceptions Impact Student Perceptions
Researcher: Laurie Burgess
Advisor: Andrea Beach, PhD
Institution: Western Michigan University Department of Educational Leadership, Research, & Technology, College of Education

You are invited to participate in a research study that will investigate instructor and student perceptions of community in postsecondary classrooms. This study will be used by Laurie Burgess, the researcher, on her dissertation to fulfill the requirements of the PhD in the Educational Leadership program at Western Michigan University.
This consent form is intended to outline the purpose of the study, the participants, the time commitment involved, and other relevant information to inform individuals' decisions to participate. Please read this form carefully. Thank you for your consideration.

Purpose of this study:
This study will take place during March and April, 2017 and will examine student and instructor perceptions of sense of community (SOC) in the postsecondary traditional classroom. Furthermore, this study will determine whether there is a relationship between student and instructor perceptions of community and instructional methods.
Participants in this study:
Participants eligible for this study are full-time instructors and students within their courses who will be drawn from undergraduate courses from colleges and universities located in the Midwest.
Time commitment and involvement for participants:
This study will require participants to complete a 5 to10 minute survey during class. The survey includes questions regarding learning and connectedness that participants feel in their current course. The reading level for this questionnaire is approximately 6th grade.
Risks of participating in this study and how they will be minimized:
There are no potential risks to participants according to the researcher's knowledge. Participants will forfeit a period of time during class for the study. Participant and institution names will not be used in any dissemination of data so there is minimal chance for disclosure of confidential information.
Benefits of participating in this study:
Although there are no direct benefits to participants, the results of this study will support better practices in teaching and learning in higher education. Research shows that sense of community increases students' learning; therefore, it is important for instructors to utilize ways that facilitate classroom community in order to effectively support student learning.
Cost or compensation to participate in this study:
There are no costs or compensation for taking part in this study.
Information collected during this study:
Information collected during this study will be used by the researcher to better understand instructor and student perceptions of community in postsecondary classrooms. The data

will only be used and seen by the researcher in order to analyze and draw conclusions related to the specific research study.

Option to stop participation:

Participants, at any time, can choose to stop participating in the study. Individuals will not suffer any prejudice or penalty to stop. Furthermore, participants will experience NO consequences academically or personally if they choose to withdraw from the study.

Consent to participate:

If you have any questions regarding this study, please contact Laurie Burgess at (616)780-7007 or Andrea Beach, PhD at (616)402-9111.

You may also contact the Chair, Human Subjects Institutional Review Board (616)387-8293 or the Vice President for Research (616)387-8298 if questions or problems arise during the course of the study.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

Appendix G

Classroom Script

Script for Classroom Announcement

Introduction:

"Thank you for allowing me to come to your class. My name is Laurie Burgess, and I am a doctoral student at Western Michigan University.

The reason I am here is to invite you to take part in a study I am doing for my dissertation. More specifically, the goal of my research is to better understand the interaction of student and instructor variables on teaching and learning.

The form that you have in front of you is a Consent Document that explains important information about the study intended to help you decide whether or not you would like to participate.

Please read the form carefully."

(students read form)

Survey Instructions:

"By completing the survey, you are providing consent that I can use the information you provide for research. Remember, the data will only be used and seen by me in order to analyze and draw conclusions related to the specific research study.

(the link to the survey and access code are displayed on the consent form)

In order to access the survey, you may use any device that has internet access. Your specific classroom code is _____. After you type in this code, you may begin the survey. At the end, please click "submit".

Thank you for considering participation and for your time."

Appendix H

Crosswalk Table

Crosswalk Table

Research Question	Instrument	Constructs	Number of Items in each Construct	Statistical Procedure
R1. To what extent is there a difference between instructor and students' perceptions of SoC?	Modified CCS	<u>Instructor SoC</u>		Independent Samples *t* test
		Learning	*n*=10 (C02, C04, C06, C08, C10, C12, C14, C16, C18, C20)	
		Connectedness	*n*=10 (C01, C03, C05, C07, C09, C11, C13, C15, C17, C19)	
		Total Classroom Community	*n=20 (*C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20)	
	CCS	<u>Student SoC</u>		
		Learning	*n*=10 (C02, C04, C06, C08, C10, C12, C14, C16, C18, C20)	
		Connectedness	*n*=10 (C01, C03, C05, C07, C09, C11, C13, C15, C17, C19)	
		Total Classroom Community	*n=20 (*C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20)	

R2. What is the influence, if any, of student characteristics (gender, class level) on students' perceptions of SOC?	CCS	Gender	*n*=1	Single Level Regression
		Class level	*n*=4 (freshman, sophomore, junior, senior)	
		Repeat Instructor	*n*=1	
		Campus Living	*n*=1	
		<u>Student SoC</u>		
		Learning	*n*=10	
		Connectedness	*n*=10	
		Total Classroom Community	*n*=20	
R3. What is the influence, if any, of instructor characteristics (gender, years teaching) on students' perceptions of SoC?	Modified CCS	Gender	*n*=1	Two-level Hierarchical Linear Modeling (HLM)
		Years teaching	*n*=1	
		Discipline	*n=1*	
		<u>Student SoC</u>		
		Learning	*n*=10	
		Connectedness	*n*=10	
		Total Classroom Community	*n*=20	
R4. What is the influence, if any, of instructional methods on students' perceptions of SoC?	CCS	<u>Student SoC</u>		Two-level HLM
		Learning	*n*=10	
		Connectedness	*n*=10	
		Total Classroom Community	*n*=20	
	PIPS (2F)	F1: Student-Centered Practice	*n*=15 (P02, P04, P06, P07, PO8, P09, P10, P12, P13, P14, P15, P16, P18, P19, P20)	
		F2: Instructor-Centered Practice	*n*=9 (P01, P03, P05, P11, P17, P21, P22, P23, P24)	

	PIPS (5F)	F1: Student-Student Engagement	*n*=6 (P10, P12, P13, P14, P15, P19)	
		F2: Content Delivery	*n*=4 (P01, P03, P05, P11)	
		F3: Formative Assessment	*n*=5 (P04, P06, P08, P18, P20)	
		F4: Student-Content Engagement	*n*=5 (P02, P07, P09, P16, P17)	
		F5: Summative Assessment	*n*=4 (P21, P22, P23, P24)	
R5. What influence, if any, do instructor perceptions of SoC influence students' perceptions of SoC?	Modified CCS	<u>Instructor SoC</u>	*n*=20	Two-level HLM
		F1: Learning	*n*=10	
		F2: Connectedness	*n*=10	
	CCS	<u>Student SoC</u>		
		Learning	*n*=10 (C02, C04, C06, C08, C10, C12, C14, C16, C18, C20)	
		Connectedness	*n*=10 (C01, C03, C05, C07, C09, C11, C13, C15, C17, C19)	
		Total Classroom Community	*n=20 (*C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20)	

Key: SoC=Sense of Community; CCS=Classroom Community Scale; Modified CCS=Modified Classroom Community Scale; PIPS=Postsecondary Instructional Practices Survey; 5F=5-Factor model; 2F=2-Factor model; P=PIPS item; C=CCS item; MC=Modified CCS item

Appendix I

Correlation Matrix

Pearson Correlations between the Outcome Variables and Student Predictor Variables (N = 891)

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Gender	--								
2. Repeat Instructor	0.12**	--							
3. Campus Living	0.10**	-0.06*	--						
4. Dual Enrolled	-0.05	-0.03	-0.12**	--					
5. Freshman	0.04	-0.22**	0.30**	-0.06	--				
6. Sophomore	0.06*	-0.05	0.20**	-0.06*	-0.37**	--			
7. Junior							--		
8. Senior	-0.03	0.20**	-0.30**	-0.04	-0.24**	-0.27**		--	
9. Fifth Year	0.04*	0.04	-0.07*	<-0.01	-0.05	-0.06*		-0.04	--
10. Connectedness	0.10**	0.20**	<0.01	-0.02	-0.03	0.01		-0.08**	0.10**
11. Learning	0.10**	0.20**	-0.08*	0.05	-0.08*	0.05		-0.03	0.06*
12. Total Classroom Community	0.12**	0.21**	-0,04	0.02	-0.06*	0.03		-0.06*	0.09**

** p < .01
* p < .05

Appendix J

Descriptive Statistics of Students for the Classroom Community Scale Subscales Items and Total Classroom Community

Descriptive Statistics of Students for the CCS Subscales Items and Total Classroom Community

Item		*M*	*Mdn*	*SD*
Connectedness				
1.	I feel that students in this course care about each other.	2.58	2.72	.75
3.	I feel connected to others in this course.	2.55	2.60	.87
5.	*I do not feel a spirit of community.	2.72	2.78	.89
7.	I feel that this course is like a family.	1.71	1.66	.94
9.	*I feel isolated in this course.	2.89	3.00	.84
11.	I trust others in this course.	2.78	2.81	.69
13.	I feel that I can rely on others in this course.	2.63	2.83	.83
15.	I feel that members of this course depend on me.	1.61	1.59	.95
17.	*I feel uncertain about others in this course.	2.54	2.72	.84
19.	I feel confident that others will support me.	2.67	2.86	.76
Learning				
2.	I feel that I am encouraged to ask questions.	3.13	3.05	.81
4.	*I feel that it is hard to get help with I have a question.	3.09	3.18	.80
6.	I feel that I receive timely feedback.	2.94	3.00	.79
8.	*I feel uneasy exposing gaps in my understanding.	2.33	2.37	.95
10.	*I feel reluctant to speak openly.	2.57	2.79	.98
12.	*I feel that this course results in only modest learning.	2.29	2.35	.99
14.	*I feel that other students do not help me learn.	2.72	2.93	.85
16.	I feel that I am given ample opportunities to learn.	3.03	3.00	.71
18.	*I feel that my educational needs are not being met.	2.96	3.08	.88
20.	*I feel that this course does not promote a desire to learn.	3.05	3.01	.90
Total Classroom Community		52.85	53.77	9.73

Rovai, A. P. (2002a);*Items were reverse coded, n = 891

Appendix K

Descriptive Statistics of Instructors for the Classroom Community Scale Subscales Items and Total Classroom Community

Descriptive Statistics of Instructors for the CCS Subscales Items and Total Classroom Community

Item		*M*	*Mdn*	*SD*
Connectedness				
1.	I feel that students in this course care about each other.	2.94	2.97	.63
3.	I feel connected to students in this course.	2.89	3.00	.95
5.	*I do not feel a spirit of community.	2.83	2.93	.81
7.	I feel that this course is like a family.	1.94	2.00	1.04
9.	*Students feel isolated in this course.	2.86	2.86	.76
11.	Members trust each other in this course.	2.69	2.74	.71
13.	Members feel that they can rely on others in this course.	2.61	2.63	.68
15.	I feel that members of this course depend on me.	3.22	3.23	.48
17.	*Students feel uncertain about others in this course.	2.31	2.38	.88
19.	Students feel confident that others will support them.	2.93	2.90	.64
Learning				
2.	Students feel encouraged to ask questions.	3.14	3.18	.63
4.	I feel that it is easy for students to get help from me when they have questions.	3.22	3.24	.59
6.	I feel that I give students timely feedback.	2.83	3.00	1.02
8.	*Students feel uneasy exposing gaps in their understanding.	2.00	2.09	.59
10.	*Students feel reluctant to speak openly.	2.36	2.48	1.15
12.	*Students feel that this course results in only modest learning.	2.31	2.32	1.06
14.	*Students feel that other students do not help them learn.	2.69	2.71	.71
16.	Students are given ample opportunities to learn.	3.42	3.46	.64
18.	I think that students feel their educational needs are being met.	2.83	2.87	.65
20.	I think students feel that this course promotes a desire to learn.	2.75	2.77	.73
Total Classroom Community		54.77	54.60	9.54

Rovai, A. P. (2002a);*Items were reverse coded, $n = 36$

Appendix L

Descriptive Statistics of Instructors for the Postsecondary Instructional Practices Survey Items by Construct and Category

Descriptive Statistics for the Postsecondary Instructional Practices Survey Items by Construct and Category

Item	*M*	*Mdn*	*SD*
Category. Instructor-Centered Practice **Construct.** Content Delivery			
1. I guide students through major topics as they listen and take notes.	2.17	2.00	1.05
3. My syllabus contains the specific topics that will be covered in every class session.	3.39	4.00	.96
5. I structure my course with the assumption that most of the students have little knowledge of the topics.	1.58	1.00	1.18
11. My class sessions are structured to give students a good set of notes.	2.14	2.00	1.07
Category. Instructor-Centered Practice **Construct.** Summative Assessment			
21. My test questions focus on important facts and definitions from the course.	2.08	2.00	1.31
22. My test questions require students to apply course concepts to unfamiliar situations.	3.39	2.00	1.24
23. My test questions contain well-defined problems with one correct solution.	1.64	2.00	1.26
24. I adjust student scores (e.g., curve) when necessary to reflect a proper distribution of grades.	1.47	2.00	1.44
Category. Student-Centered Practice **Construct.** Student-Student Interactions			
10. I structure class so that students explore or discuss their understanding of new concepts before formal instruction.	1.61	2.00	1.22
12. I structure class so that students regularly talk with one another about course concepts.	2.69	3.00	1.11
13. I structure class so that students constructively criticize one another's ideas.	1.56	1.50	1.22
14. I structure class so that students discuss the difficulties they have with this subject with other students.	1.64	1.00	1.09
15. I require students to work together in small groups.	2.89	3.00	1.19
19. I require students to make connections between related ideas or concepts when completing assignments.	2.92	3.00	.93
Category. Student-Centered Practice **Construct.** Student-Content Interaction			
2. I design activities that connect course content to my students' lives and future work.	3.03	3.00	.81
7. I frequently ask students to respond to questions during class time.	3.31	3.00	.74
9. I have students use a variety of means (models, drawings, graphs, symbols, simulations, etc.) to represent phenomena.	1.69	2.00	1.16
16. I structure problems so that students consider multiple approaches to finding a solution.	2.08	2.00	1.01
17. I provide time for students to reflect about the processes they use to	1.86	2.00	1.01

solve problems.

Category. Student-Centered Practice **Construct.** Formative Assessment			
4. I provide students with immediate feedback on their work during class (e.g., student response systems, short quizzes, etc.).	1.72	1.00	1.40
6. I use student assessment results to guide the direction of my instruction during the semester.	2.31	2.00	.85
8. I use student questions and comments to determine the focus and direction of classroom discussion.	2.53	2.00	1.00
18. I give students frequent assignments worth a small portion of their grade.	2.67	3.00	1.17
20. I provide feedback on student assignments without assigning a formal grade.	1.00	1.00	.79

Walter, Beach, Henderson, & Williams (2014), $n = 36$