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VARIABLES ASSOCIATED WITH SENSE OF COMMUNITY IN ONLINE AND
ON-GROUND CLINICAL DOCTORATE EDUCATION

by

Tracy A. Chapman

A DISSERTATION

Presented to the Faculty of
The Graduate College at the University of Nebraska
In Partial Fulfillment of Requirements
For the Degree of Doctor of Philosophy

Major: Educational Studies
(Internet-Based Education)

Under the Supervision of Professor Allen Steckelberg

Lincoln, Nebraska

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VARIABLES ASSOCIATED WITH SENSE OF COMMUNITY IN ONLINE AND
ON-GROUND CLINICAL DOCTORATE EDUCATION

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University of Nebraska, 2012

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This study examined classroom community, as measured by the Classroom Community Scale (Rovai, 2002c), among online and on-ground students ($N = 386$) enrolled in Doctor of Pharmacy or Doctor of Occupational Therapy courses. Multiple regression analysis identified variables (student and course variables) shown to significantly predict the presence of community among students. Results revealed the set of predictor variables are different for each sub-group of students. Community among on-ground students was predicted by the amount of small group work used in a course, the course's primary type of learning outcome (affective or cognitive), and the students' self-reported estimated grade. For online students, community was best predicted by the students' year in the program, estimated grade in the course, gender and age. Outcomes for pharmacy students illustrated the amount of small group work used in a course and the type of learning outcome (affective or cognitive) primarily used in the course predict the degree to which students' feel a sense of community. Community among occupational therapy students was predicted by the type of learning outcome (affective or cognitive) primarily used in the course and the students' estimated grades.

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DEDICATION

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CHAPTER 1: INTRODUCTION

Current Landscape of Online Education in the United States

Online education in United States post-secondary institutions continues to expand (Allen & Seaman, 2011; McCarthy & Samors, 2009). For the tenth straight year, the annual survey of online education in the United States conducted by the Sloan Foundation found the higher education enrollment growth rate in online courses far outpaced that of campus-based courses (Allen & Seaman, 2011). The most recent report by the Sloan Foundation shows enrollment in online courses is expanding at a rate approximately ten times that of higher education in general. Thirty-one percent of all post secondary students are taking at least one online course. While acknowledging the rapid growth of online education cannot continue forever, Allen and Seaman (2011) hypothesize the growth of online education will continue into the foreseeable future.

Although online education has become part of the fabric of higher education, it continues to face some considerable challenges. The United States Department of Education (USDoE) continues to increase its scrutiny of online education and formulate regulations designed to assure online education programming is of sound quality. Differences in attrition rates between online and face-to-face students are one area of particular interest. Student persistence in online courses is believed to be negatively impacted by feelings of isolation and disconnectedness, in other words a lack of community (Conrad & Donaldson, 2004; Haythornthwaithe, Kazmer, Robins & Shoemaker, 2000; Kazmer, 2004; McPherson & Nunes, 2004; Rovai, 2003). To assist in

mitigating this higher dropout rate, it is important to foster feelings of community among the students (Ashar & Skenes, 1993; Tinto, 2000, Vann & Hinton, 1994; Walker, 2008).

In addition to increased regulatory scrutiny and lower rates of student persistence, online education and higher education in general face the added challenges presented by the current fiscal climate. Budget cuts in post secondary institutions due to the current economic downturn present administrators with a shrinking pool of resources to address a myriad of institutional needs (Basken, 2011; Biemiller, 2011; National Association of State Budget Officers, 2011). As a result, institutions have an obligation to make data-driven decisions to assure optimal use of resources. This includes support resources for online education to address low persistence rates and to help develop community among online students.

Sense of Community

McMillan & Chavis (1986) defined community 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” (p. 9). The importance of developing a sense of community among learners has been explicated in many studies (Akyol & Garrison, 2008; Beldarrain, 2006; Boettchner & Conrad, 2004; Rovai, 2002a, 2002b, 2003; Shea, 2006; Shea, Li & Pickett, 2006). Current researchers suggest a sense of community among online learners plays a role in academic success and student persistence (Shea, 2006; Shea, Li & Pickett, 2006; Walker, 2008). Investigation of community among online learners includes two key bodies of work, one underpinned

by the Community of Inquiry framework and the other by the notion of Classroom Community.

Garrison, Anderson, and Archer's (2000) Community of Inquiry (CoI) provides a theoretical framework to examine community in online courses. Based on the notion that a sense of community is associated with students' perception that learning has occurred, the CoI framework is intended to represent all elements of community, not just the social aspect which has been the primary focus of early studies of community in online education. Garrison et al. (2000) postulate community develops as a result of the intersection of social presence, cognitive presence, and teaching presence. The juxtaposition of the three presences is represented in Figure 1.1.

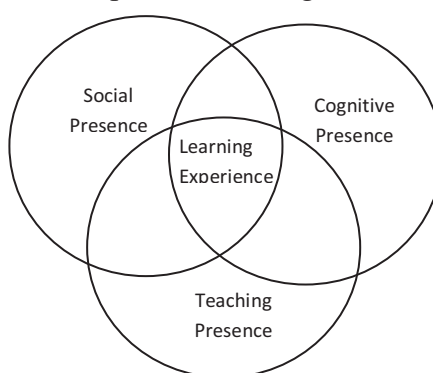


Figure.1.1 Community of Inquiry (COI). The three components of the Community of Inquiry theoretical framework.

Community in online courses was also examined by Rovai (2002a, 2002b, 2002c, 2003). His Classroom Community Scale (CCS) was developed to provide consistency and validity to the study of community in online learning environments. Rovai (2002b) posits classroom community consists of four dimensions; spirit, trust, interaction, and commonality of expectation and goals (learning). Spirit encompasses feelings of

friendship, cohesion and bonding among learners. The dimension of trust includes a feeling among members of the community that they can rely on each other; they have confidence in other members (credibility). Interaction addresses communications for the purpose of advancing learning as well as building relationships. The notion of common expectations is related to the degree to which community members' attitudes demonstrate their dedication to a common purpose. Figure 1.2 illustrates the four dimensions of Rovai's Classroom Community model as well as the components of each dimension.

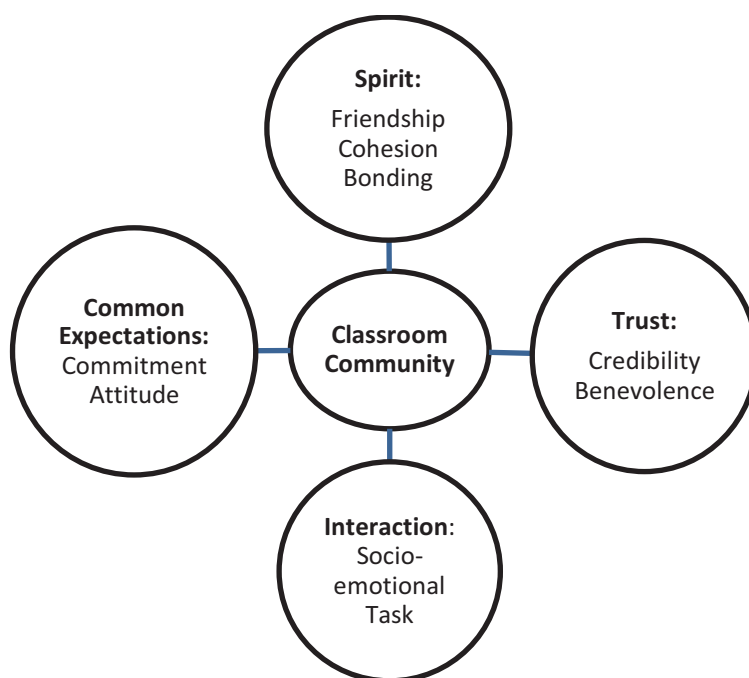


Figure 1.2. Dimensions of Classroom Community. The four dimensions of the Classroom Community framework and the major components of each dimension.

Purpose of Study

Although the study of community in online courses receives a substantial amount of attention in educational research literature, several investigators call for more focused examination of this topic (Bentz, 2010; Conrad, 2005; Lear, Ansorge, Steckelberg, 2010; Liu, Magjuka, Bonk, & Lee, 2007; Rovai 2001; Salas, Kosarzycki, Burke, Fiore, & Stone, 2002; Tsai, Kim, Liu, Goggins, Kumalasari, & Laffey, 2008). Specifically, they note the need for discipline-specific exploration. Furthermore, much of the current research lacks a comparison of community between online and on-ground learning environments. While the notion of community among face-to-face students is well documented in educational literature, and the importance of community in online environments has been investigated to some depth, few studies exist in which community in the two learning environments are compared (Bentz, 2010).

The purpose of this study was to identify student characteristics and course characteristics related to sense of community in clinical doctorate courses at a private university in the Midwestern United States in which all students are taking a full-time course load. The study was designed to answer the question, “What student characteristic variables and course characteristic variables are associated with sense of community within the context of courses contained in a doctor of occupational therapy and a doctor of pharmacy program?”

The intent of this study was to contribute to the body of research addressing effective administrative practices for health sciences educational programming. The researcher sought to synthesize findings in order to identify variables which can be used by

administrators responsible for health science education courses to proactively identify courses which should receive priority attention to help advance sense of community. The ability to proactively identify courses at risk of low community will assist administrators in making informed resource allocation decisions.

Illustration of Variables

Independent variables for this study were classified as course characteristics or student characteristics. Course characteristics included (1) the amount of small group work used in a course, (2) the primary type of learning outcomes in a course (affective or cognitive), (3) the percentage of students in a course receiving a grade of D or F, and (4) the mean score for the student self-report of the difficulty of the course subject matter. Student characteristics included (1) pathway in which the student is enrolled (campus or distance), (2) the student's current year within the program of study (first, second, or third), (3) the estimated average number of hours the student was employed each week during the semester, (4) the student's current course grade as estimated by the student, (5) student's gender, and (6) student's age.

The dependent variable for this study was Rovai's Classroom Community Scale (CCS) score which is designed to measure sense of community in a learning environment. The 20-item instrument generated an overall classroom community score as well as sub-scores for connectedness and learning. According to Rovai (2002c) the connectedness score represents "feeling of the community of students regarding their connectedness, cohesion, spirit, trust and interdependence" (p. 206). The learning

subscale of the CCS instrument provides a score related to “feelings of community members regarding interaction with each other as they pursue the construction of understanding and the degree to which members share values and beliefs concerning the extent to which their educational goals and expectations are being satisfied” (p. 206).

Table 1.1 lists the variables used in this study.

Table 1.1 Independent and Dependent Variables

Independent Variables	Dependent Variables
<u>Course Characteristics</u> Amount of small group work Learning outcome type Number of Ds and Fs Difficulty of the subject matter	(Measure) Sense of classroom community as measured by the Classroom Community Scale
<u>Student Characteristics</u> Pathway enrollment Year in the program Number of hours employed Course grade Gender Age	

Methods

This quantitative, non-experimental, correlation study identified variables appearing to be related to sense of classroom community for online and on-ground

students. Participants included students enrolled in select courses during the first, second and third years of two health sciences clinical doctorate programs. The first three years of the programs were selected because the didactic course work occurs during these years. During the fourth and final year in each program students spend the vast majority of their time on clinical rotations. During clinical rotations students are completing program requirements in an environment very different from the classroom. They are placed in a variety of clinical settings and work closely, either one-on-one or in very small groups, with a licensed clinician to perform many of functions of a licensed health care professional. Therefore, to help assure students are responding to the survey based on their experience in similar educational environments (classroom), only students in the first three years of the programs were invited to participate.

Data were collected from online and on-ground students via an anonymous web-based survey. The sample size for the study was 654 students enrolled in six courses.

The survey included Rovai's Classroom Community Scale items, plus an additional six items related to the student characteristics and one item (difficulty of subject matter) related to the course characteristics. Data for the remaining course characteristic variables were collected from the following sources:

- Amount of small group work used in the course – course syllabus
- Primary type of learning outcomes in the course – course syllabus
- Percentage of students in the course receiving a grade of D or F at the time of the survey – Office of Academic and Student Affairs

The Classroom Community Scale is a valid instrument to measure students' sense of community (Rovai, 2002c) and has been cited in several scholarly publications (Baturay & Bay, 2010; Dawson, 2008; Lear et al., 2010; Ni, & Aust, 2008; Rovai, 2003; Rovai & Jordan, 2004; Rovai & Ponton, 2005; Shea, 2006; Smith, 2008).

All students in the programs included in the study are issued tablet PC computers upon entering their program; it is assumed students used these computers to complete the survey. Therefore, the number of technical issues encountered by participants when attempting to complete the survey was likely minimal.

To answer the research questions, "Are student variables within the given set related to sense of classroom community?" and "Are course variables within the given set related to sense of classroom community?" simple correlations were computed between each variable and the Classroom Community Scale rating. The relative impact of course and student characteristics on overall sense of classroom community was determined through the use of multiple regression analysis.

Target Audience for the Study

The primary audience for this study is administrators working in higher education health sciences programs. Knowledge of the variables impacting students' sense of community within the context of health sciences education will provide a foundation which can be used to assist in structuring programs and allocating resources to optimize community building among students and between students and faculty members.

Significance of Study

The maturation of online education calls for research of variables impacting the success of distance education (Arbaugh & Benbunan-Fich, 2007). The uncertainty about effective educational practices in the relatively new educational environment of online learning requires further investigation by the research community (McCarthy & Samors, 2009; Shea, 2006; Swan, 2002). Specifically, new knowledge is needed to understand how to foster the social aspects of learning in the online environment (Tsai et al., 2008). Higher dropout rates among online learners demands further investigation of this growing aspect of the educational landscape (Brown, 2001; Chyung, 2001; Tyler-Smith, 2006).

Researchers emphasize the importance of method over media in researching online education. Best practices in course design and pedagogy, including evidence-based practices in the use of multimedia, are advocated (Clark & Meyer, 2011; Garrison & Arbaugh, 2007; Rovai, 2002a; Tsai et al., 2008). Furthermore, others suggest specific factors impacting the ability to build sense of community among students warrant further investigation (Conrad, 2005; Liu et al., 2007; Rovai, 2001, 2002a; Tsai et al. 2008). Examination of demographic factors such as age and gender is advocated by some researchers. (Rovai, 2001, 2002a; Tsai et al., 2008). The interaction of course or subject-specific factors such as the length of the course and course content (Rovai, 2001, 2002a; Tsai et al., 2008) on sense of community and student learning merits further investigation (Wallace, 2003). The significance of course-specific factors is also emphasized by Shulman (2002) in his discussion of the importance of learning community and professional education. He asserts that in addition to the intellectual aspects, professional

education must also socialize students to the profession. Preparing students to work within the norms of a profession, to recognize and adopt the manner in which those within the profession think and act, can be advanced by building a sense of community among learners. The vast majority of current literature explores sense of community in online graduate courses with part-time adult learners as the study participants. The lack of information about community among full-time, online students and students enrolled in professional education programs is evidence that additional research in this area is warranted. Moreover, as noted by Bentz (2010), few studies have explored sense of community by comparing online and distance courses. Furthermore, investigation of community as related to students' grades and year within a program of study is extremely limited. In reporting the results of a study conducted jointly by the Association of Public and Land-grant Universities and the Sloan Foundation, McCarthy & Samors (2009) challenged educators and administrators to (1) either provide the data to counter the perception that online education is of inferior quality or, (2) if the perception is indeed the reality, then take the steps necessary to improve this rapidly growing facet of education.

This study provided a unique examination of an important construct of education, sense of community, from the perspective of full-time online and on-ground students enrolled in courses within professional programs taught simultaneously by the same instructor, with the same learning goals and objectives, and using the same learning materials.

Limitations of Study

Limitations within this study are related to sampling technique, unidentified variables, potential lack of thoughtful responses by students, the unique context of the programs in the study, and the number of courses included in the study.

This study employed non-probability convenience sampling for participant selection. As a result, sampling error cannot be determined and the findings may not be generalizable to other populations.

The study outcomes may be impacted by unidentified variables influencing students' responses to the CCS survey items. These outcomes may include:

- Students' potential feeling of aggravation about completing the survey
- A lack of confidence in the confidentiality of survey responses on the part of students
- Students' feelings or emotions unrelated to the course on the day the survey is completed
- Varying prerequisite knowledge or aptitude for particular subjects that may influence students' self report of level of difficulty of the subject matter
- The fact that the students in years two and three of the program may have been taking courses together since year one.

The survey was administered after spring break. Students were asked to consider activities and events from the beginning of the semester until the date of the survey.

Therefore, students' recollections may not be accurate.

The study involved only full-time students enrolled in one of two professional programs with a prescribed, lock step curriculum; this limits the generalizability of results to other educational settings.

Six courses were included in the study; therefore generalizability of the course characteristics results may be limited.

Assumptions of Study

Assumptions for this study include:

- Students responded honestly to the CCS, student characteristic survey items and the level of difficulty course characteristic survey item.
- Students understood the CCS survey items and were able to make clear delineations of their feelings in order to use the response scale.
- Students were able to limit their responses to the survey items to their thoughts about the course involved in the study.

Definition of Terms

Campus pathway. The campus pathway for each program consists of all of the on-ground courses in the program and is the pathway in which the on-ground students enroll.

Class. The group of students entering the doctor of occupational therapy or doctor of physical therapy program each fall term.

Distance pathway. The distance pathway for each program consists of all of the online courses in the program and is the pathway in which the online students enroll.

On-ground course. An on-ground course is defined as a course that is offered such that students assemble in a physical classroom at specific dates and times on the physical campus.

On-ground student. On-ground students are students enrolled in the campus pathway and therefore are taking on-ground courses.

Online course. The definition for an online course used in this study is from the Higher Learning Commission (2011). Online courses are defined as “those in which all or the vast majority (75% or more) of the instruction and interaction occurs via electronic communication or equivalent mechanisms, with the faculty and students physically separated from each other” (p. 1). The online courses are offered within the Distance pathway.

Online student. Online students are students enrolled in the distance pathway and who take all of their courses online; they are physically separated from the instructor.

Pathway. Each program participating in the study is comprised of two pathways, distance and campus. Each program has a single accreditation process which accredits the entire program, including both pathways. The distance and campus pathways are not reviewed or accredited separately.

CHAPTER II: REVIEW OF LITERATURE

This study of variables associated with sense of classroom community in online health sciences courses was framed by relevant literature in several areas including (a) community, (b) learning community, and (c) learning community and online students. Rovai's classroom community framework serves as the theoretical framework for this study.

Community

The term community can refer to geography or the quality of a human relationship. McMillan and Chavis (1986) note that historically, communities were dependent upon the geographical location of members. Functional communities, requiring geographic proximity of community members, were formed to meet basic needs such as food, clothing, shelter, education, or health care. Having group members in close, or relatively close, proximity to each other supported and promoted productivity and social order. As these basic needs were met, development of communities focused on human relationships occurred (Westheimer & Kahne, 1993). These communities are defined by a "sense" or feeling rather than a tangible entity (Brook & Oliver, 2002). Centered on interpersonal relationships and personal fulfillment, these relational communities rely on various forms of communication to build group cohesiveness rather than physical proximity (Westheimer & Kahne, 1993).

Research in psychological sense of community spans several decades. Seymour Sarason's work in community psychology during the 1970s resulted in publication of *The*

Psychological Sense of Community: Prospects for a Community Psychology (Sarason, 1974). Acknowledging psychological sense of community is difficult to define, Sarason (1974) suggests it is “the sense that one was part of a readily available, mutually supportive network of relationship upon which one could depend and as a result of which one did not experience sustained feelings of loneliness that impel one to actions or to adopting a style of living masking anxiety and setting the stage for later and more destructive anguish” (p.1). Occasional relationships, such as when family and friends are geographically separated, exacerbate feelings of lack of community (Sarason, 1974). Building on the work of Sarason, McMillan and Chavis (1986) defined community and identified four key tenets which underpin the development of community.

The term community can be geographically based such as a neighborhood, town, or city (Gusfield, 1975 as cited in McMillan and Chavis, 1986), or relational, “a result of interaction and deliberation by people brought together by similar interests and common goals” (Westheimer & Kahne, 1993). McMillan and Chavis’ theory of sense of community encompasses both aspects of community.

According to McMillan and Chavis (1986), community 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” (p.9). The four elements of community initially suggested by McMillan and Chavis (1986) include membership, influence, reinforcement, and shared emotional connection. The first element, membership, encompasses the notion of boundaries,

emotional safety, a sense of belonging and identification, personal investment, and a common symbol system. The interplay of these attributes defines “who is part of the community and who is not” (p.11). McMillan and Chavis characterize the second element, influence, as “a sense of mattering, of making a difference to a group and of the group mattering to its members” (p.9). Influence works in two directions. An individual is attracted to a group if she has some influence over the group’s activities. On the other hand, a group must be able to exert influence over its members in order to obtain cohesiveness and therefore group sustainability. Reinforcement or integration and fulfillment of needs, the third element, refers to “the feeling that members’ needs will be met by the resources reviewed through their membership in the group” (p.9). Individuals associate with a group because they feel it will serve their needs. The fourth and final element of community proposed by McMillan and Chavis is shared emotional connection, “the commitment and belief that members have shared and will share history, common places, time together, and similar experiences” (p.9).

Building on the work of McMillan and Chavis, the Sense of Community Index (SCI) was developed to determine the relative influence of each element of community on an individual’s sense of community (Chavis, Hogge, McMillan, & Wandersman, 1986). Data gathered using the SCI demonstrated an overall sense of community could be predicted using McMillan and Chavis’ four elements of community.

Reflecting on 20 years of literature and experience related to sense of community, McMillan proposed a revised and rearranged set of dimensions for community

(McMillan, 1996). Replacing membership with spirit, influence with trust, reinforcement with trade/interaction, and shared emotional connection with art/learning, McMillan describes his revised notion 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).

Spirit

Similar to the dimension of membership, spirit encompasses the notion of boundaries to distinguish community members from nonmembers. McMillan’s (1996) updated notion of community refers to a “spark of friendship” (p. 315) which results in a feeling of connectedness to others. A feeling of community grows with a sense of emotional safety, when members can be honest in discussing their feelings with others and can be themselves. In order for this to occur, community members must exhibit empathy, understanding and caring. Boundaries contribute to emotional safety by distinguishing appropriate content for group discourse as well as the time and place for the group to be a group (McMillan, 1996). A sense of belonging also contributes to spirit. Individuals are attracted to a community when they believe they will be welcome, when they believe they belong in a community. This faith of belonging to a community must be validated via community acceptance in order for individuals to feel a sense of attachment to the community. However, new community members must be tested to ascertain their degree of commitment and loyalty to the community, their willingness to exert the time and effort required to be a supportive and effective community member

(McMillan, 1996). Conversely, members can reasonably expect support from the community in return. The degree to which a community member is accepted by the group is a factor of a member's investment in the group, up to a limit. If a member is asked to do more than he is able, humility resulting from the visibility of the member's inadequacy may result in decreased attachment to the community.

Trust

Sense of community begins with a spark and is nurtured by the presence of boundaries, emotional safety, and sense of belonging. The sustainability of a community beyond the initial spark depends upon the presence of an authority structure. Trust is developed when the authority structure has order, decision-making capability, authority based in principle rather than person, and group norms that allow members and authority to influence each other reciprocally (McMillan, 1996). Order, the presence of community norms or rules, sets the stage for development of trust. When a sense of order is present, the environment is predictable, and members know what they can expect from each other. To maintain a sense of order and allow a community to make decisions and process information, an individual or individuals must have authority over others in the community. Those vested with this authority must base their decisions on advancing the interests of the community, not self-interest. Trust is further cultivated when power differentials are kept to a minimum and influence, not coercion, is employed by community leaders. Group cohesion is promoted in an atmosphere of the exchange of power. Decision makers influence community members and community members exert influence over decision makers concurrently.

Trade

A social economy begins to develop in communities in which spirit is alive and well and a trusted authority structure is in place (McMillan, 1996). Strong communities contain an ongoing bargaining process created as members realize how they can help each other as well as the community as a whole. The numerous rewards community members realize from these exchanges serve to strengthen the community. McMillan (1996) suggests the rewards are innumerable and may include status, competence, or success, with protection from shame being the most valued reward. Community members' initial search for shared traits with other members begins the process of bonding; identification of commonalities with other members results in feelings that it is safe to be oneself. As groups mature and cohesion is solidified, members are able to engage in disagreements, to begin to look for not only similarities but also differences with other members. Identification of variances among members' needs and resources sets the stage for trading within the group. Critical to the successful development of trade is the continued protection from shame among group members. Initially, members build a foundation upon which trade will occur by sharing feelings they have in common and sharing positive feelings about each other. With the underpinning of safety and understanding of each other established, members can begin to engage in discourse, debate, and offer differences of opinion. McMillan (1996) cautions that trade in the community must be fair. Early trading may involve keeping a balance sheet of some type to assure the fairness of trades. In strong communities score keeping fades away and fairness in trading becomes a community norm.

Art

McMillan (1996) suggests the combination of spirit, trust and trade creates a community's shared history which becomes the story of the community. Art expresses this story and represents the community's values and traditions in symbols (rites, images, myths, rituals, ceremonies, etc.). Experiences that are shared among community members, have a dramatic impact, and represent the community's transcendent values are those typically selected to be represented by art (McMillan, 1996). Art outlives community members and therefore closes the loop of the four elements of community which depend on and reinforce each other.

The advent of computer-mediated communication and affordability of personal computers led to a decrease in reliance of geographical proximity for community formation (Putnam, 2000). Ironically, some feel that the very electronic communication tools that lessen the dependence on geographic location for community formation have led to a weakened sense of community (Etzioni, 1993; Kreijns, Kirschner, & Jochems, 2003; Putnam, 2000). Due to a variety of factors, including the rapid development of and ubiquitous access to technology and mass media, the population in the United States is less empathetic and less willing to unite in communities (Putnam, 2000). Given the exponential growth of technology-facilitated online education, the notion that technology and lack of physical proximity negatively impact community has significant implications for communities within the context of education. The importance of community to the educational enterprise is explored in the following section of this literature review.

Learning Communities

Learning communities are typically recognized as a subset of community, as a specific type of community. As such, a learning community is concerned with employing the constructs of community to foster learning and to recognize and support the notion that knowledge is socially constructed and occurs through interactions between individuals working collaboratively in intellectual pursuits with learning as the intended outcome (Angelo, 1999; Chickering & Gamson, 1987; Cross, 1998; Schön, 1995; Shulman, 1999; Tinto, 1995; Visser, 2003; Whipple, 1987).

The social nature of learning was recognized by John Dewey more than a century ago in his advocacy for students to become part of a social community in which the study of disciplines are not isolated, but connected to each other and to the ‘real world’ (Dewey, 1909). The importance of interaction in learning is advanced by the work of learning theorists such as Bruner, Vygotsy, and Piaget. Bruner viewed active participation of learners a critical element in their ability to make meaning out of course content (Harasim, 2012). The critical nature of moving beyond the simple imparting of information to including social interaction as a means to help students learn from others is supported by Vygotsky’s zone of proximal development. Vygotsky suggested a difference exists between the problem solving ability of a student working alone and when working in collaboration with someone more advanced (Chaiklin, 2003). Piaget also believed in the importance of connecting learners to each other, but unlike Vygotsky, suggested the learners be equal partners in collaborating to construct knowledge (Harasim, 2012). Encompassing the beliefs advanced by learning theorists, Shulman

(1999) campaigns for placing education in a social context, “Learning is least useful when it is private and hidden; it is most powerful when it becomes public and communal. Learning flourishes when we take what we think we know and offer it as community property among fellow learners so that it can be tested, examined, challenged, and improved before we internalize it” (p. 12). Furthermore, Shulman (2002) notes the importance of learning communities within the context of education to prepare students to enter a profession, stating “learning to be a professional isn't a purely intellectual endeavor. To become a professional, one must learn not only to think in certain ways but also to perform particular skills, and to practice or act in ways consistent with the norms, values, and conventions of the profession” (p.39).

Meiklejohn's Experimental College at the University of Wisconsin in the 1920s was the advent of a formal recognition of learning communities in higher education (Smith, 2001). Alexander Meiklejohn, an educational leader in the early part of the 20th century, believed an interdisciplinary, general education was critical to “preparing students for democratic citizenship” (p.2). Observing a trend in higher education of increased emphasis on research and specialization of academic departments, and a division of the curriculum into increasing smaller units of specialization, Meiklejohn became concerned that general education would go by the wayside. In response he began the Experimental College which focused on interdisciplinary, team taught curricula. Designed to intentionally develop community among students and faculty, the Experimental College's pedagogy was underpinned by active learning and application of

theory. Instructors served as facilitators rather than the traditional role of lecturers in front of a classroom.

Low enrollment and the significant dichotomy between the educational structure of the Experiential College and the prevailing context of higher education at the time resulted in lack of support for Meiklejohn's experiment (Smith, 2001). Consequently, the Experimental College did not last long. However, it set the stage for a re-emergence of interest in learning communities in the 1960s.

Spawned by rapid growth in higher education enrollment, learning community structures were adopted by some institutions as a means of making the learning experience more personal and meaningful. Similar to the Experimental College, traditional institutional organization structures presented significant barriers to the success of the 1960s learning community movement (Smith, 2003). Although many of the initiatives did not survive, mainstream education began adopting some of the learning community constructs, including active learning, student-centered learning, interdisciplinary programming, and increased relevance of curricula (Smith, 2001). The establishment of the Washington Center for Undergraduate Studies at Evergreen State College as a national advocate for the use of learning community structures, coupled with significant research demonstrating the effectiveness of holistic, integrated learning experiences, led to a resurgence of interest in learning communities during the mid to late 1980s. Broader adoption of learning community pedagogies (service learning, assessment, inquiry-based learning, etc.), support from some key leaders and scholars as

well as granting institutions, and increased public scrutiny of higher education effectiveness have coalesced to provide continued support and advocacy for the formation of learning communities (Cross, 1998; Hill, 1985; Smith, 2001).

No single structure is required for a learning community to be recognized as such (Cross, 1999; Hill, 1985; Smith, 1991; Tinto, 2003). The most basic structure occurs when a group of students are intentionally scheduled to take a block of courses together (Tinto, 2003). Although dimensions of community vary from setting to setting (Hill, 1996) and evolve over time (Brower & Dettinger, 1998), in general, learning communities are arranged to facilitate shared knowledge (structuring courses such that students engage in an interdisciplinary learning experience), shared knowing (constructing knowledge together such that all community members' perspectives and knowledge is part of the learning process), and shared responsibility (students are responsible to each other and mutually dependent in the learning process) (Tinto, 2003).

The concept of a learning community has evolved throughout its periodic emergence in higher education throughout the last century. The contemporary perspective of learning community is one in which learners have a shared sense of purpose and work together to achieve their goals. Learning communities are found in a variety of educational settings, including professional schools and colleges, in which communities help advance, not only cognitive aspects of learning, but socialization to the profession. Additionally, the recent rapid growth of online education has been accompanied by interest in learning communities among online learners.

Learning Community and Online Learners

According to Palloff and Pratt (2007), an online learning community “allows for mutual exploration of ideas, a safe place to reflect on and develop those ideas, and a collaborative, supportive approach to academic work” (p. 26). The concept that community is not geographically dependent, that community can develop through activities people do together regardless of physical location (Westheimer & Kahne, 1993), supports the contention that community can develop in online learning environments. Due to the relationship between sense of community and online student success, the growth of online learning has been accompanied by a keen interest in identifying effective strategies to develop learning communities in the online classroom environment. The literature in this area documents the importance of learning communities in online education, offers frameworks for examining and describing such communities, and discusses factors impacting the development of a sense of community among online learners.

Importance of Community in Online Education

The exponential growth of online courses and programs over the past decade has been accompanied by increased scrutiny of distance education by regulatory agencies and the public (DiRamio & Wolverton, 2006). Recent regulatory changes found in the Higher Education Opportunity Act (HEOA) of 2008 (United States Department of Education, 2008) include increased accountability for online programs. Examples include:

- Mandates for documented processes to verify the identity of distance students accompanied by warnings that requirements in this area are expected to become more stringent.
- Requirements for institutions to document how they calculate credit hours for online courses.
- Documentation requirements to determine the last day of attendance for students dropping an online course, documentation must include evidence of academic engagement within the course, not just logging into the course web site.
- Requirements for institutions offering online courses to register with each state in which they are doing business, including identifying the various individual state definitions of doing business.
- Gainful employment regulations requiring institutions to show there is a market for its online program graduates.

Contrary to the evidence that online students are engaged (National Survey of Student Engagement, 2009) and achieve learning outcomes at least as well as students in on-ground courses (Means, Toyama, Murphy, Bakia, & Jones, 2009), online education continues to be viewed as inherently inferior to traditional face-to-face education (Allen & Seaman, 2011; McCarthy & Samors, 2009). Primary areas of concern regarding online education are student retention and quality of the learning experience (Liu et al., 2007).

Parity of learning outcomes for on-ground and online learners can be used as one quality indicator for online programs. This aspect of online education has been

extensively examined, with most study results indicating no significant differences in outcomes (Caywood & Duckett, 2003; Hale, Mirakian, & Day, 2009; Johnson, Aragon, Shaik, & Palma-Rivas, 2000; McLaren, 2004; Summers, Waigandt, & Whittaker, 2005; Tallent-Runnels et al., 2006). Perhaps the most widely known of such efforts to compare online and face-to-face student outcomes is the work of Russell (2001) in the “No Significant Difference Phenomenon,” a compilation of 355 reports and studies which indicate no significant difference in learning outcomes between distance and face-to-face delivery of education. A meta-analysis of web-based and classroom instruction effectiveness supports Russell’s work (Sitzman, Kraiger, Stewart, & Wisher, 2006). An examination of 96 studies demonstrated no differences in teaching effectiveness for declarative knowledge and procedural knowledge when the same instructional methods were used, suggesting the instructional method rather than the instructional venue (classroom or online) impacts learning outcomes. However, significant differences between online and face-to-face education in the area of student attrition rates have been documented by several researchers (Ashar & Skenes, 1993; Bernard et al., 2004; Carey, 2001; Carr, 2000; O’Brien & Renner, 2002; Rovai, 2003).

In addition to learning outcomes, structuring online courses and programs to intentionally engage students and create communities of learners is recognized as a hallmark of quality online education (Quality Matters, 2011; Shelton, 2010). Students in online courses report feeling a sense of isolation (Conrad & Donaldson, 2004; Haythornthwaithe, Kazmer, Robins, & Shoemaker, 2000; Kazmer, 2004; McPherson & Nunes, 2004; Twigg, 1997) and tend to drop out at a higher rate than those in face-to-face

settings (Chyung, 2001). Dropout rates for online learners have been reported to be as high as twice that of traditional students, with studies reporting attrition rates between 20%-50% (Ashar & Skenes, 1993; Carr, 2000; O'Brien & Renner, 2002). In fact, students' experiences in the initial weeks of an online class are a major predictor of whether they will continue in the course or enroll in other online courses (Haythornthwaite et al., 2005). Students who feel a sense of community, feel connected to other learners and to the instructors, feel supported and able to honestly express their thoughts and opinions are more likely to complete the course or program of study (Tinto, 2000, Vann & Hinton, 1994; Ashar & Skenes, 1993, Walker, 2008). Greater flow of information exchange with other students, experiencing a higher level of feeling supported, a higher commitment to achieving course outcomes, and generally a better sense of well being are reported by students who feel a sense of community (Conrad, 2005; Rovai, 2002b). Tsai et al. (2008) found sense of community to be a direct predictor of satisfaction with online learning. Sense of community has been positively correlated with students' perceived cognitive learning (Rovai, 2001; Sadara, Robertson, Song, & Midon, 2009) and the success of online students (Gunawardena & Zittle, 1997; Palloff & Pratt, 2007). Benbunan-Fich and Hiltz (2003) found online students' active participation, motivation, and collaboration to be significant predictors of online students' perceived learning. Baturay and Bay's (2010) work examining the use of problem-based learning strategies and community suggest that increased interaction among students results in increased student achievement.

Frameworks for Learning Community in Online Courses

Several frameworks exist for explaining and examining community in online learning settings. Chief among these are the Community of Inquiry (CoI) framework advanced by Garrison, Anderson, and Archer (2000) and Rovai's (2002b) Classroom Community Scale (CCS).

Community of inquiry framework. Comprised of three interlocking elements, social presence, teaching presence, and cognitive presence, Garrison & Arbaugh (2007) state the Community of Inquiry (CoI) was developed as a means to define a theoretical framework to “provide order and parsimony to the complexities of online learning” (p. 158). Each of the three presences contained in the CoI framework includes multiple categories (Garrison & Arbaugh, 2007). Affective expression, open communication, and group cohesion fall within the realm of social presence. Cognitive presence is described as a four phase model which includes a triggering event, exploration, integration – meaning construction, and resolution. Teaching presence encompasses instructional design and organization, facilitating discourse, and direct instruction. Based on the notion that a sense of community is associated with perceived learning, Garrison et al., (2000) sought to develop a model representing all elements of community, not just social presence which had been the primary focus of early studies of community in online education.

Classroom community. The framework advanced by Rovai (2002b) is focused around the notion of classroom community. Many definitions for classroom community

are found in the literature and most definitions contain several common elements, including trust building; connection of spirit; sense of belonging, membership, support; and a sharing of the educational journey (Shea, Li, Swan, & Pickett, 2005).

Encompassing these elements commonly attributed to classroom community, and building on McMillan and Chavis' (1986) definition of community, Rovai (2001) proposed a definition of classroom community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, that they have duties and obligations to each other and to the school, and that they possess shared expectations that members' educational needs will be met through their commitment to shared goals" (p. 34). Accordingly, he suggests four dimensions can be used to define classroom community: spirit, trust, interaction, and commonality of expectations and goals (Rovai, 2002b).

The dimension of spirit encompasses recognition of membership in a community, feelings of acceptance and belonging, and a feeling of group identity and bonding among learners (Rovai, 2001, 2002b). Learners who feel they are part of a group, and who are connected with each other look forward to spending time together and are able to nurture, as well as challenge, each other. Lack of spirit can result in low student involvement leading to feelings of isolation, loneliness, low self-esteem and motivation, and eventually high drop-out rates.

The second dimension of community advanced by Rovai (2002b), trust, represents community members' willingness to rely on each other. Learners feel safe and

therefore are willing to speak candidly, to expose gaps in their learning with the expectation that other members will respond with supportive feedback and assistance. Trust includes the notion of credibility; learners are able to rely on the word of other community members. Benevolence, also a component of trust, is the expectation that community members genuinely care about the welfare of each other, are ready and willing to assist others in the learning process. Without trust, students are hesitant to engage with each other, discourse among students is minimal, the classroom and the learning experiences become teacher centered, and learners miss opportunities to work together to gain new perspectives and construct common understandings of the course concepts.

Rovai (2002b) suggests interaction as the third dimension of community with the caution that interaction is not inherently a positive goal. Both the quantity and quality of the interaction must be considered. Task-driven and socio-emotional types of interaction must be incorporated to assure an effective impact on community development. Task driven interaction generally takes place as students respond to assignments, posting responses to discussion postings or peer assessments. Conversely, socio-emotional interaction is initiated by the learner. Building relationships among learners, this type of interaction typically involves self disclosure and empathetic messages. Increased self-disclosure tends to be reciprocated by others; thereby students get to know each other better and increase their mutual support of community members.

The fourth and final dimension of classroom community suggested by Rovai (2002b) is common expectations among learners. In other words, community members value learning and expect learning will occur. In a classroom community, the learners accept that the group's purpose is learning. They believe their learning needs will be satisfied, their knowledge will be enhanced, and they will develop a deep understanding of the concepts contained in the course by actively participating in a community.

Rovai's notion of classroom community aligns with Dewey and others position that learning occurs through interactions between individuals working collaboratively (discussed on pages 22-23 of this literature review). Rovai suggests that levels of interaction and collaboration are related to the existence of classroom community; higher levels of community are related to higher levels of interaction and collaboration (Rovai, 2001).

These two frameworks, CoI and CCS, have several elements in common and agree that building a feeling of community among online learners requires intentional planning and skilled facilitation by the course instructor. Both are recognized in the literature as valid measures of community. Rovai's Classroom Community Scale was used as the theoretical underpinning for this study due to its high degree of alignment with commonly accepted dimensions of learning community, namely shared knowledge, shared knowing, and shared responsibility.

Key Factors Affecting Community in Online Courses

The four dimensions of classroom community advocated by Rovai, spirit, trust, interaction, and common expectations, are influenced and supported by many factors explicated by researchers in the field of online learning. These factors can be categorized as transactional distance, social presence, social equality, small group activities, group facilitation, teaching style and learning stage, and community size (Rovai, 2002b).

As Conrad (2005) notes, “Community grows, it is not made or given. Neither course designers, administrators, nor instructors can give a sense of community to learners” (p.17). However, the factors that set the stage for the development of a community can be intentionally arranged to promote the creation of this essential underpinning of the learning environment. A discussion of these factors as described by Rovai (2002b) follows.

Transactional Distance. Moore (as cited in Chen, 2001) describes transactional distance as the psychological and communication space between learners and instructors. He suggests the amount of transactional distance is different for each person and can be managed by both the instructor and the learner. The amount of structure or control exerted by the instructor impacts transactional distance, increased control results in increased feelings of distance and lessening of feelings of community. Learners are able to manage feelings of distance through the use of dialog; increases in dialog result in lessening feelings of distance and increasing sense of community. Directed facilitation of discourse is one means by which transactional distance can be managed (Garrison et al.,

2000; Shea, 2006). The instructor must find the right balance of providing structure and promoting interaction (Shannon, 2002). Behaviors that draw students into discussions, keep students on track, diagnose and correct misperceptions and help students identify areas of consensus are viewed as strong contributors to building a sense of community (Rovai, 2002b; Shea, 2006). Although the need for instructors to provide structure and purpose to the design of learner-learner interaction is recognized, too much structure leads to decreased dialog and therefore an increase in the feelings of distance and isolation (Conrad, 2005; Rovai, 2002a). The positive correlation of frequency of discussion posting throughout the duration of a course and sense of community alludes to the relationship between flow of information and development of community (Conrad, 2005; Rovai, 2001; Tsai et al., 2008). However, interaction overload can result in reduced feeling of community (Palloff & Pratt, 2007). Effective instructional design and organization can help assure appropriate levels of interaction as well as clarity of expectations, and thus impact learning community development (Falvo & Solloway, 2004; Garrison et al., 2000; Shannon, 2002; Shea, 2006; Vealé, 2009). Design elements which advance community development include a clear and consistent course structure and organization (Swan, 2002; Vealé, 2009), establishing unambiguous expectations (Rovai, 2002a; Vealé, 2009), providing students exemplars to guide the accomplishment of learning tasks including communications (Abedin, Daneshgar, & D'Ambra, 2010; Ko & Rossen, 2010; Rovai, 2002a), and including learner participation as a graded component of the course (Ko & Rossen, 2010; Rovai 2002b). Vealé (2009) found transactional distance was impacted by students' transition to the online learning

environment; their level of computer skills, comfort with the technology used in the course, and difficulties faced taking an online course as compared to a face-to-face course. Furthermore, environmental factors may have an effect on transactional distance (Vealé, 2009). These factors include distractions posed by a student's environment (e.g., work or family obligations), level of Internet access, ineffective use of hyperlinks within the course, and ineffective use of technologies in the course.

Social Presence. This factor of community refers to the sense of being together and with others (Lehman & Conceição, 2010), the ability of learners and instructors to feel socially and emotionally connected, to project themselves as 'real' (Rourke, Anderson, Garrison, & Archer, 2001). Social presence does not naturally occur in the online classroom; it must be intentionally nurtured and supported (Liu et al., 2007; Paloff and Pratt, 2007; Rovai, 2002b). A sense of cohesion or feeling of being connected to other learners and the instructor has a major influence on students' sense of community (Abedin, Daneshgar, & D'Ambra, 2010; DiRamio & Wolverson, 2006; Vealé, 2009). The use of socio-emotional interactions such as empathetic messages, encouraging, self-disclosure and discussing individual backgrounds and interests serve to foster the feeling of connectedness (Ko & Rossen, 2010; Paloff & Pratt, 2007). Energetic, responsive, frequent and constructive feedback from instructors contributes to the sense of social presence (Conrad, 2005; Rovai, 2002a; Swan, 2002; Swan, & Shih, 2005). Students' awareness of others members' activities promotes a sense of community, the ability of students to see the 'footprints' of others within the course (Abedin, Daneshgar, & D'Ambra, 2010; Laffey, Lin, & Lin, 2006; Rovai, 2002b). Tsai et al. (2008) hypothesize

students' perception of a communication tool's usefulness directly impacts their sense of community.

Social Equality. Instructors of online courses must assure all learners have an equal opportunity to contribute to course discussions and other course activities (Rovai, 2002b). Differences in male and female communication styles can threaten the formation of classroom community. Males are more likely to use an independent (impersonal, assertive, authoritative) voice and therefore alienate other learners, resulting in reduced participation levels (Abedin, Daneshgar, & D'Ambra, 2010; Rovai, 2002b). The majority of females use a connected (supportive, helpful) voice, suggesting they prefer to learn in an environment in which cooperation is valued more than competition (Abedin, Daneshgar, & D'Ambra, 2010; Rovai, 2002b). Instructors must establish expectations of respect of differing views, and may at times need to have private conversations with aggressive students to manage their course participation.

Small Group Activities. Establishing small groups of learners provides opportunities for all to be meaningfully engaged in course activities (Ko & Rossen, 2010; Palloff & Pratt, 2007; Rovai, 2002b). Working in smaller groups helps students form connections with each other, encourages interdependence among group members and thereby promotes a sense of community (Aragon, 2003; Conrad, 2005; Rogers & Lea, 2005). As noted in the previous discussion of transactional distance, although structure can decrease sense of community, some degree of structure is needed, such as assigning specific tasks and establishing timelines (Ko & Rossen, 2010; Rovai 2002b).

Group Facilitation. The ability to facilitate group interactions, to encourage and inspire learners to interact, is critical to the formation of classroom community. Two aspects of group facilitation, those related to the task of the group and those related to building and maintaining the group itself, are needed to effectively form groups and therefore advance classroom community (Rovai, 2002b). Task-focused facilitation requires the instructor to exhibit humility, allowing the students' voices to be heard as they seek to construct knowledge. 'From sage on the stage to guide on the side,' an oft repeated phrase describing the shifting instructor role in the move to the online classroom, exemplifies the group task facilitation role (Paloff & Pratt, 2007; Rovai, 2002b). The instructor's role in building and maintaining the group is described by Rovai (2002b) as the ability to "alter or to maintain the group's way of working, to strengthen, regulate, and perpetuate the group as a group" (p. 9). As the group facilitator, an instructor is advised to help students gradually transition into the online environment (Conrad, 2005; Conrad & Donaldson, 2004; Ko & Rossen, 2010; Ludwig-Hardman & Dunlap, 2003; Rovai, 2002a). This transition should be carefully and intentionally designed as an essential component of the online courses (McInnerney & Roberts, 2004).

Teaching Style and Learning Stage. This factor addresses the match between an instructor's teaching style (degree of authoritarianism and directiveness versus learner-centered teaching style) and learning stage (the degree to which learners are self-directed). A mismatch between teaching style and learning stage results in lower sense of community (Rovai, 2002b). Although a perfect match is not likely to occur between each learner and instructor, striving to identify learner's placement on the continuum from

dependent to self-directed learner, and employing an appropriate teaching style to match the learner's stage will promote community development (Lepper & Chabay, 1985 as cited in Rovai 2002b). Designing learning activities such that students are provided with a graduated introduction to working collaboratively online can assist with the alignment of teaching style and learning stage. Conrad and Donaldson's (2004) Phases of Engagement outlines the roles of learner and instructor as they evolve during a course. Beginning with instructor-directed activities (instructor as the social negotiator) and students working independently as the newcomers, student dyads are then formed (students as cooperators) with the instructor providing learning activities requiring critical thinking and sharing of ideas (instructor as structural engineer). Students then advance to collaborators and work in small groups to solve problems with the instructor serving as a facilitator. Finally students are initiators/partners, designing or leading activities; the instructor becomes a community member and challenges students to apply knowledge to new situations.

Community Size. The class appropriate size for online courses has been debated since the inception of online education (Ko and Rossen, 2010). Some researchers argue smaller class size results in better student achievement (McCarthy & Samors, 2009; Rovai, 2002b), while others suggest teaching strategies are more important than class size in determining student achievement, with the caveat that class size for online courses should generally be smaller than for the same course in a face-to-face setting (Ko & Rossen, 2010; Swan, 2002). In general, the literature suggests class sizes between 15-30

are optimal for online courses (Aragon, 2003; Hanna, Glowacki-Dudka, & Conceigao-Runlee, 2000; Palloff & Pratt, 2007; Rovai 2002a).

Demographics are not included as its own category in Rovai's seven factors impacting development of community. Some studies have found student demographics impact sense of community while others found the opposite to be true. Prior experience with online learning was found to result in increased interaction (Brown, 2001; Rovai, 2001). Conversely, neither gender, age, employment status, reason for taking the course, physical distance from campus, or previous online learning experience were found by Shea (2006) to significantly contribute to students' sense of community.

Summary

The continuing growth of online education, increased scrutiny by regulatory agencies and fiscal realities of shrinking budgets is well documented. The relationship between students' sense of community and achievement of educational outcomes is emphasized in the literature. Specifically noted is the importance of community in professional education. The vast majority of the research cited in this literature review examined either on-ground or online students, but did not compare sense of community between the two learning environments. The relationship between student demographics (such as age, gender, employment status, and experience with online education) and feelings of community is not clear; the literature provides conflicting information. Furthermore, minimal if any of the literature addresses investigation of community among full-time, online learners or the relationship of community to course grades,

difficulty of the subject matter, or type of course learning outcome (cognitive or affective).

A major role for administrators in higher education is to make resource allocation decisions in support of academic programs, a responsibility made increasingly difficult by the current fiscal constraints of shrinking budgets. In order to assure effective distribution of limited funds, decision makers must have accurate information that is relevant to the context of their educational programs. Therefore, an investigation of the variables noted in this summary, those for which the current literature does not provide sufficient information, was warranted.

CHAPTER III: METHODOLOGY

Introduction

A review of the literature demonstrates the importance of sense of community to the success of students enrolled in online courses (Benbunan-Fich & Hiltz, 2003; Conrad, 2005; Palloff & Pratt, 2007; Rovai, 2002b; Tinto, 2000; Tsai et al., 2008; Walker, 2008). Specifically, Tinto (2000) and Walker (2008) found students who feel a sense of community are less likely to feel isolated and are more likely to complete their course or program of study. Tsai et al. (2008) found sense of community to be a direct predictor of satisfaction with online learning. A positive correlation between sense of community and students' perceived cognitive learning was found by Benbunan-Fich and Hiltz (2003), Rovai (2001), and Sadera, Robertson, Song, & Midon (2009).

Researchers emphasize the importance of understanding variables which foster sense of community, and incorporating those variables into course design and pedagogy (Garrison & Arbaugh, 2007; Falvo & Solloway, 2004; Garrison et al., 2000; Shea, 2006; Tsai, 2008). The need for further research of the specific variables impacting the ability to build sense of community among students is noted by several investigators (Bentz, 2010; Conrad, 2005; Liu et al., 2007; Rovai, 2001, 2002a; Tsai et al., 2008).

Purpose

Sense of community in the context of health science education programs was explored in this study. The purpose of this study was to identify variables related to

sense of community in clinical doctorate courses in which students are taking a full-time course load at a private university in the Midwestern United States.

The findings of this study should be of value to those interested in the administrative aspect of educational programming, specifically administrators responsible for health science education courses. Synthesis of the findings will assist administrators in determining courses in which low sense of community is likely to exist and therefore provide administrators the opportunity to proactively intervene. Increased scrutiny of online courses and programs by regulatory agencies combined with the ongoing challenges of budget cuts and shrinking pools of financial resources highlights the importance of effective allocation of support resources. The ability to identify courses at risk of low community will assist administrators in making informed resource allocation decisions.

Methodology

The research methodology incorporated a quantitative, non-experimental, correlational design to identify variables which affect students' overall sense of community. Creswell (2005) notes that experimental research designs are used to "...establish a possible cause and effect relationship between the independent and dependent variable" (p. 283). The study sought to identify relationships between variables, not cause and effect; therefore a non-experimental design was selected. A specific type of non-experimental research design, correlational design, was used as it aligned with the purpose of the study. Correlational research is used to investigate the

relationship of two or more variables to see if they influence each other (Creswell, 2005).

Statistical assumptions were tested to ensure there is statistical conclusion validity.

Research Questions

The central research question for this study was, “What student characteristic variables and course characteristic variables are associated with sense of community?”

The central question was explicated by investigating the following sub-questions:

1. Are student variables within the given set related to sense of classroom community?
 - a. If so, which have a significant relationship to sense of community?
 - b. Are the variables with significant relationships to sense of community the same for online and on-ground students?
 - c. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Occupational Therapy program?
 - d. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Pharmacy program?
2. Are course variables within the given set related to sense of classroom community?
 - a. If so, which have a significant relationship to sense of community?
 - b. Are the variables with significant relationships to sense of community the same for online and on-ground students?

- c. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Occupational Therapy program?
 - d. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Pharmacy program?
3. What variables within the given set appear to have strongest relationship to sense of classroom community?
- a. Which appear to have strongest relationship to sense of classroom community for online students? For on-ground courses?
 - b. Which appear to have strongest relationship to sense of classroom community for students enrolled in a Doctor of Occupational Therapy program?
 - c. Which appear to have strongest relationship to sense of classroom community for students enrolled in a Doctor of Pharmacy program?

Variables

The independent variables selected for this study were classified as course characteristic variables and student characteristic variables. Course characteristic variables were (1) the amount of small group work used in the course, (2) the primary type of learning outcomes used in the course (affective or cognitive), (3) the percentage of students in the course receiving a grade of D or F, and (4) the average score of student self-report of the difficulty of the course subject matter.

The amount of small group work used in each course was determined by the number of small group assignments for each course. Based on prior knowledge about the structure of the courses which are part of the study, the investigator expected the number of small group assignments to range between one and six. The type of primary learning outcome for each course was either cognitive or affective. Cognitive learning outcomes are those which can be demonstrated by (1) knowledge recall, (2) comprehending or internalizing knowledge, (3) applying knowledge to new situations, (4) dissecting a concept and analyzing its component parts, (5) synthesizing information in a novel way in order to solve a problem, and (6) evaluating ideas or actions (Mager, 1999). Affective learning outcomes are exhibited by (1) a willingness to attend to learning stimuli, (2) active participation in learning activities including seeking out and enjoyment of these activities, (3) internalization of a set of specified values as evidenced by consistent demonstration of attitudes or appreciation consistent with the values, and (4) synthesis of conflicting values resulting in internalization of a set of values (Learning Taxonomy-Krathwohl's Affective Domain, n.d.). Percentage of students receiving a D or F was determined by using all final grades assigned in the course for the last five years. The time span of the last five years was selected as the Office of Academic and Student Affairs is able to access final grades for each course beginning in 2005. If the grading scale used to assign grades within a course had changed, the percentage of Ds or Fs was calculated using all final grades assigned in the course from the first semester in which the new grading scale was used. The average score of student self-report of the difficulty

of the course subject matter was calculated as an average of student Likert scale responses using a 4-point scale; 4= very difficult, 3= difficult, 2= easy, 1=very easy.

Student characteristic variables included (1) the pathway in which the student is enrolled (campus or distance), (2) the student's current year within the program of study (first, second, or third), (3) the estimated average number of hours the student was employed each week during the semester as reported by the student, (4) the student's current course grade as estimated by the student, (5) student's gender, and (6) student's age.

Several criteria were used to select these variables, including (1) identification of the variable in the literature as having a relationship to sense of community but little or no comparison between online and on-ground courses, (2) minimal or conflicting information found in the literature about the variable's relationship to students feelings of community, (3) data based on the variable that is typically accessible by administrators of online courses or programs.

The dependent variable for this study was Rovai's Classroom Community Scale (CCS) score which is designed to measure sense of community in a learning environment. The 20-item instrument generates an overall classroom community score as well as sub-scores for connectedness and learning (Rovai, 2002c). Appendix A contains a copy of the Classroom Community Scale instrument.

Subjects

The experimentally accessible population for this study was any full-time student (online and on-ground) enrolled in a course taught primarily by a single instructor which is part of a doctor of pharmacy or doctor of occupational therapy curriculum at the private, mid-sized university in the Midwestern United States at which the study was conducted. The sample population consisted of students (online and on-ground) enrolled in select courses in the first three years of either the doctor of occupational therapy program or the doctor of pharmacy program. The courses selected for the study were chosen because each is taught by one instructor. A non-probability convenience sample was used in this investigation due to its ready availability to the researcher.

Instructors of the courses selected for the study were asked to allow the researcher to survey the students in their course. Table 3.1 provides an overview of the study sample.

Table 3.1. Descriptors of Study Variables

Course Name	Program of study	Program Year	Learning Outcome Type	Online student enrollment	On-ground student enrollment
Pharmaceutics II: Sterile and Non-sterile Dosage Forms (PHA 327)	Doctor of Pharmacy	1	Cognitive	67	114
Foundations of Public Health (PHA 351)	Doctor of Pharmacy	2	Cognitive	74	111
Ethics in the Health Care Professions (PHA 456)	Doctor of Pharmacy	3	Affective	71	55
Introduction to Health Care Ethics (OTD 352)	Doctor of Occupational Therapy	1	Affective	9	46
Research Process II: Research Proposal (OTD 409)	Doctor of Occupational Therapy	2	Cognitive	10	43
Critical Analysis of Occupational Therapy Practice (OTD 541)	Doctor of Occupational Therapy	3	Affective	9	45

Conditions

This study identified variables which affect sense of classroom community among full-time, online and on-ground students enrolled in professional education programs, specifically a doctor of a pharmacy or doctor of occupational therapy program at a mid-sized university in the Midwestern United States. Each program offers two pathways, a campus pathway and a distance pathway.

The doctor of pharmacy program enrolls 115 students in the campus pathway each year and between 70-75 students in the distance pathway. Online students are located throughout the United States. All students in the program engage in three years of didactic course work and spend their fourth year on clinical rotations at sites throughout the United States. The program's curriculum includes 101 credit hours of didactic and lab-based courses which are taught in two, 15-week semesters each academic year, followed by 40 credit hours of clinical rotations. The curriculum is offered in a lock-step fashion in which all students, on-ground and online, in a given class take the same courses at the same time from the same instructors(s) during the first three years of the program. For example, all students who entered the program in the fall of 2011, and therefore are slated to graduate in May of 2015, will complete all of their classes together. The class sequence is prescribed by the curriculum. Each didactic semester includes 15 to 18 credit hours. Laboratory experiences are embedded throughout the curriculum for the on-ground students. Online students come to the campus each summer for five to ten days for laboratory experiences. No part-time students are admitted to the program.

The doctor of occupational therapy program enrolls 45 students in the campus pathway each year and 10 in the distance pathway. The distance pathway is facilitated through a partnership with a public university in another state. All online students are required to live within a few hours' driving distance of the public university's campus, which provides the facilities for the laboratory portions of the curriculum. All students in the program engage in six semesters of didactic course work. One credit hour of clinical rotations is included in each of the didactic semesters. The last two semesters of the program are primarily composed of clinical rotations, with one credit hour of seminar studies required for each of these semesters. The program's curriculum includes 93 credit hours of didactic and lab-based courses which are taught in 15-week semesters and 51 credit hours of clinical rotations. The program includes three terms each academic year. The curriculum is offered in a lock-step fashion in which all students, on-ground and online, in a given class take the same courses at the same time from the same instructors(s) during the first six semesters of the program. The class sequence is prescribed by the curriculum. Each semester includes 13-18 credit hours. Laboratory experiences are embedded throughout the curriculum for both the on-ground and online students. No part-time students are admitted to the program.

The online learning environment is based on the university's learning management system. Each course web site within the learning management system contains a variety of learning resources, including articles, instructor-generated study notes, PowerPoint presentations, and access to communication tools such as email, asynchronous discussion boards, and synchronous web conferencing. All lectures for on-

ground students are recorded using a commercial lecture capture solution. The recordings include audio from the classroom sound system, information shown through the classroom data projector, and a video of the instructor captured with a ceiling mounted video camera. These three data streams are automatically synchronized, sent to a streaming server, and links to the lectures are automatically posted in the course web site. Students are presented with three links for each recorded lecture; audio only, audio plus classroom data projector information (typically PowerPoint slides), and audio plus classroom data projector information plus video of the instructor. Links to the lectures are posted to the course web site usually within three hours of the conclusion of the on-campus lecture. Both on-ground and online students are given access to the online learning environment.

Online student interactions with instructors and with each other occur via web conferencing, e-mail, chat, instant messaging, discussion boards, phone calls, and in some cases via social networking tools. Frequency of interactions varies by course and instructor.

All students are provided with a tablet PC computer upon entering their program. The computer includes the Microsoft Office suite as well as other software needed for the program. All online students are required to have a high speed Internet connection at their home. Support for all of the technology used in the program, including the tablet PCs, is provided by an information technology support unit within the school offering the programs. A toll free number is available for online students to use whenever they need

to contact the School. Appendix B contains a description of the school and programs in which participants are enrolled.

Research Instrument Description

The Classroom Community Scale (CCS) instrument developed by Rovai (2002c) to measure students' perception of overall classroom community was used in data collection. This instrument was selected based on its ability to provide an overall sense of community score, its reliability and validity, and the instrument's recognition by other scholars as a meaningful measure of community as evidenced by citations in scholarly publications. A copy of the CCS is located in Appendix A.

The 20-item survey included 10 positively worded items and 10 negatively worded items. Statements such as the following were part of the CCS (Rovai, 2002c):

I feel connected to others in this course.

I feel reluctant to speak openly.

I feel that this course results in only modest learning.

I feel confident that others will support me.

A five point Likert scale of potential responses: strongly disagree, disagree, neutral, agree, and strongly agree, follow each survey item. Participants were asked to choose the response for each item that best reflected their feelings.

An additional six items were added after the CCS items to collect data for student characteristics; pathway enrollment, year in program, estimated average number of hours

employed per week during the semester, current course grade, gender, and age. One item was added to report data for one of the course characteristics, level of difficulty of the course material. Table 3.2 identifies the additional items and response options presented for each item. Completion time for the survey was expected to be 10 minutes.

Table 3.2: Additional Survey Items

Survey Item	Response Scale
Pathway enrollment	Distance, Campus
Year in Program	1st, 2nd, 3rd
Average number of hours employed per week this semester	Fill in the blank (whole numbers only)
Current grade in this course	A, B, C, D, F
Gender	Female, Male
Age	Fill in the blank
Difficulty of the subject matter	Very difficult, difficult, easy, very easy

Development of the CCS was based on applying McMillian and Chavis' (1986) four elements of community (spirit, trust, interaction, and learning) to a particular type of community, the classroom. Rovai (2002c) notes that three university professors of educational psychology evaluated the CCS instrument and rated the CCS items as "totally relevant to sense of community in a classroom setting" (p.204). The CCS has been cited in several scholarly publications (Dawson, 2008; Rovai, 2001, 2003; Rovai & Jordan, 2004; Shea, 2006; Smith, 2008) as being highly reliable and valid.

Initial field-testing of the CCS involved 375 students enrolled in 28 different courses. Inter-rater reliability of the CCS was measured by two internal consistency estimates which demonstrated excellent reliability (Rovai, 2002c). Cronbach's coefficient α for the entire Classroom Community Scale was .93. The equal-length split-half coefficient corrected by the Spearman–Brown prophecy formula was .91.

An analysis of CCS validity demonstrated high face as well as content and construct validities as reported in Rovai (2002c). High face validity indicates the instrument appears to measure what it intends to measure; in other words the items included in the CCS appear to be those needed to measure students' sense of classroom community. Content validity demonstrates the CCS encompasses all critical elements which together comprise feelings of classroom community among students. Construct validity, the extent to which a test measures the concept or construct that it is intended to measure, affirms the CCS actually provides a measure of students' sense of classroom community (the construct being measured).

CCS was shown to have a Flesch Reading Ease score of 68.4 on a 100 point scale, in which higher scores indicate ease of understanding. Furthermore, the CCS reflects a Flesch-Kincaid grade level score of 6.6. These scores indicate the reading level of the CCS items is appropriate for the study sample.

Data Collection

Dependent variables, student variables and a course variable data

The survey to collect data on dependent variables, student variables and one course variable was administered in March of 2012 using a web-based survey tool. The timeframe was chosen as it is typically a less busy time for students. The survey was administered after mid-term exams and before final exams; therefore the investigator believed students were more likely to take the time to respond to a survey. Furthermore, by this point in the semester students have had sufficient time to form opinions for the topics addressed within the Classroom Community Scale survey. The investigator verified via the Office of Academic and Student Affairs within the school housing the doctor of occupational therapy and the doctor of pharmacy programs that no exams or major projects are scheduled during the timeframe of the survey. To reduce sampling errors, study participants were identified using the class rosters available from the Office of Academic and Student Affairs. The roster information provided to the investigator included student name and email address. Email distribution lists for each class are maintained by the Office of Academic and Student Affairs. The Office ensures each student is listed only once and that the lists are confined to students of a particular class enrolled in a particular pathway (campus or distance).

Online and on-ground students were invited via email to participate in the web-based survey. A copy of the initial email invitation is located in Appendix C. The survey

remained open for two weeks. The students' University email accounts were used to send out invitations to participate in the study as well as for follow-up messages encouraging participation. The University email is the official mode of communication for the institution and is used by the School's faculty and administration daily to communicate to students. Students typically access their University email account multiple times per day; therefore, there was a high level of assurance students would see the email invitation to participate.

One week after the initial email invitation a second email invitation encouraging participation was sent. The follow-up email message was uploaded into the survey application which automatically generated the follow-up email messages. The same process was followed five days after the follow-up email message for a third email message. The content for both follow-up messages is included in Appendix C, along with the content for the initial email invitation.

The institution's electronic survey tool was used to deliver the web-based survey. Survey data were stored on a server in the institution's data center. The investigator's unique username and secure password were required to access the data. Access to the data was limited to the investigator.

All students participating in the survey have a school-issued tablet PC so technology access issues for the students were assumed to be minimal. No technology issues with the survey were reported to the investigator.

The investigator received an automatically generated notice for each email message that was not able to be delivered to a student's email account. The investigator was notified that the email invitation was not deliverable to five students due to the student's email Inbox being full. The investigator contacted each of these students via US Mail.

All inquiries from participants were addressed by the investigator. During the survey period students were able to contact the investigator via phone during normal business hours and were able to leave a voice mail message after hours. Students were also able to contact the principle investigator via email which was checked multiple times a day, during and after normal business hours, during the survey period.

The email invitation included a description of the survey purpose, a notification that participation is optional and that participants may withdraw from the study at any time, and a description of how anonymity of responses will be assured. Students wishing to participate were instructed to click on a link in the email message which took them to a page containing the Notice of Informed Consent. A copy of the Notice of Informed Consent is located in Appendix D.

Although the survey did not collect information protected by Federal or state regulations, nor did the data pose a risk to students, steps were taken to assure anonymity of the responses. The survey was set up for open participation; as such the survey did not collect any information which would allow the investigator to connect responses to a

specific participant. Internet Protocol (IP) addresses of respondents were not collected, nor any other electronic data that could track a response to a specific participant. The investigator believed assurance of anonymity increased the response rate and willingness of students to be honest in responding to survey items.

Two buttons appeared at the end of the Notice of Informed Consent. One button stated, “I wish to participate,” the other, “No thanks.” Students selecting the “I wish to participate” button were presented with the survey. Those selecting the “No thanks” button were presented with a page thanking them for their time and stating if they change their mind and wish to participate at a later time they can re-enter the survey using the link in the email invitation or by contacting the investigator. The investigator’s contact information appeared on the page. The ‘Thank You’ page for non-participants is located in Appendix E.

After submission of a completed survey a confirmation page appeared. The student could either save the page to their computer or print the page as evidence s/he completed the survey. A copy of the page could be redeemed for a flash drive. Students could save a copy of the page to their computer and send it to the investigator via email to redeem it for the flash drive. Alternately, students could print the confirmation page and mail it to the investigator following the instructions provided on the page. Only participants completing the entire survey received the confirmation page and therefore were eligible to receive a flash drive. The confirmation page did not provide any information which would allow the investigator to associate a participant name to survey

responses. Flash drives for campus students were placed in their individual mailboxes located within the school. Flash drives were mailed to distance students completing the survey and submitting a confirmation as evidence they completed the survey. A copy of the confirmation page is located in Appendix F.

This study was approved by the Creighton University Institutional Review Board and the University of Nebraska, Lincoln Institutional Review Board. Copies of the Institutional Review Boards approvals are included in Appendices G and H.

The electronic survey tool used for the study provided a dashboard to allow ongoing monitoring of survey responses, including number of completed surveys, number of surveys partially completed, and access to data from completed surveys as soon as they are completed. The investigator monitored the results and progress daily during the survey period.

Course Variables

Data for the course variables, with the exception of the subject difficulty course variable, were collected from university course data and course syllabi. The amount of small group work and primary type of learning outcomes used in the course data were obtained from course syllabi which the investigator requested from each instructor of courses included in the study. The percentage of students in each course receiving a grade of D or F was obtained from the Office of Academic and Student Affairs. As

previously noted, student self-report of difficulty of the subject matter was obtained from an item added to the CCS survey.

Ethical Considerations

A description of the ethical considerations relevant to this study and how each is addressed are described.

Risks to the participants: No known risks to the subject were present in the study. However, the Notice of Informed Consent included a statement acknowledging that there is the chance the subject may feel uncomfortable answering certain questions and states they are free to withdraw from study participation at any time. A copy of the Notice of Informed Consent is located in Appendix D.

Notification of study intent and optional participation: Subjects were notified in two ways that the study was for research purposes, specifically a dissertation project, and they had the choice of not participating. The email invitation sent to recruit participants stated the purpose of the study, including a statement that this was a dissertation research project and participation is optional. The content of the email invitation is located in Appendix C. This information was also contained in the Notice of Informed Consent.

Results Dissemination: The results of the study were made available to all faculty and students enrolled in the first three years of the Doctor of Occupational Therapy and Doctor of Pharmacy programs in the School of Pharmacy and Health Professions. An email was sent to all faculty and students in the first three years of the doctor of occupational therapy and doctor of pharmacy programs notifying them of the availability

of the results and inviting anyone interested in obtaining a copy of the results to notify the researcher by return email.

Anonymity: The Notice of Informed Consent explained how the anonymity of participants is protected.

Data Protection: The data were stored on a server in the institution's data center. Access to the data required the unique username and password only accessible to the researcher. During the data analysis phase the data were provided to an employee of the Nebraska Evaluation and Research (NEAR) Center at the University of Nebraska, Lincoln. The University of Nebraska, Lincoln employs individuals in the NEAR Center to assist with data analysis. The data for this study were anonymous and did not contain confidential or protected information; therefore, confidentiality of the data was not a concern. The data were maintained until completion of the dissertation defense; anticipated length of time records kept was six months from date of collection.

CHAPTER 4: FINDINGS

This investigator's intent was to identify variables related to feelings of community among students in clinical doctorate courses in which students are taking a full-time course load at a private university in the Midwestern United States. The answer to the following question was sought: "What student characteristic variables and what course characteristic variables are associated with sense of community?" Investigation of this central question was explicated by the following research questions.

1. Are student variables within the given set related to sense of classroom community?
 - d. If so, which have a significant relationship to sense of community?
 - e. Are the variables with significant relationships to sense of community the same for online and on-ground students?
 - f. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Occupational Therapy program?
 - g. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Pharmacy program?

4. Are course variables within the given set related to sense of classroom community?
 - a. If so, which have a significant relationship to sense of community?
 - b. Are the variables with significant relationships to sense of community the same for online and on-ground students?
 - c. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Occupational Therapy program?
 - d. Which show a significant relationship to sense of classroom community for students enrolled in a Doctor of Pharmacy program?
5. What variables within the given set appear to have strongest relationship to sense of classroom community?
 - a. Which appear to have the strongest relationship to sense of classroom community for online students? For on-ground students?
 - b. Which appear to have the strongest relationship to sense of classroom community for students enrolled in a Doctor of Occupational Therapy program?
 - c. Which appear to have the strongest relationship to sense of classroom community for students enrolled in a Doctor of Pharmacy program?

This chapter presents data addressing the reliability of the Classroom Community Scale as applied to this study. The demographic data is then addressed, followed by a reporting of the findings for each of the three research questions. Finally, an explanation of the analysis process for each question and the resulting statistical data will be reported.

Reliability of the Classroom Community Survey

Reliability tests were conducted on the Classroom Community Scale (CCS) to measure the instrument's internal consistency. Reliability tests are common in survey-based research and are important in determining consistency of a measure. Cronbach's alpha values at or above 0.70 typically are considered acceptable reliability coefficient values (Nunnally, 1978 as cited in Rovai, 2002c). Table 4.1 represents the CCS's reliability values as measured by alpha coefficients for this study as well as for similar prior research studies.

Table 4.1. Classroom Community Scale Reported Reliability Coefficients

Study	Cronbach's coefficient alpha
Chapman (2012)	.90
Dawson (2008)	.90
Rovai (2002c)	.93
Rovai & Wighting (2005)	.89
Shea (2006)	.93

Response Rate

The overall response rate for this survey was 59.02% (386 of 654). Among on-ground students 250 (60.39%) of the 414 students enrolled in the campus pathways responded. One hundred thirty-six of 240 (56.67%) online students responded. Pharmacy student response rate was 57.93% (285 of 492) and Occupational Therapy student response rate was 62.23% (101 out of 162).

Demographic Data

To better understand this sample population, demographic data were collected on all student participants. This data were computed for the total study sample and included pathway of enrollment (online or on-ground), year within the program of study, average number of hours working each week, current course grade, gender, and age. Overall percentages were reported for each possible response along with tables and figures to illustrate demographic data results.

Program (Pharmacy or Occupational Therapy)

Two hundred eighty-five (73.83%) of the participants were enrolled in the Doctor of Pharmacy program and 101 (26.17%) were enrolled in the Doctor of Occupational Therapy program (see Figure 4.1).

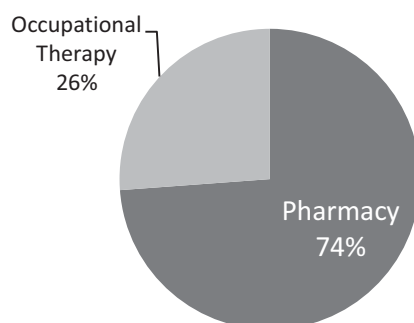


Figure 4.1. Demographic results: Percentage of participants in each program (Pharmacy or Occupational Therapy).

On-ground students accounted for 57.89% (165) of the pharmacy students, the remainder 42.11 % (120) were online students. Among occupational therapy students

84.16% (85) were on-ground students and 15.84% (16) were online. Table 4.2 summarizes these results.

Table 4.2. Distribution of Online and On-ground Students by Pathway

	Pathway		Total
	Campus	Distance	
Pharmacy students	57.89% (165)	42.11 % (120)	100% (285)
Occupational Therapy students	84.16% (85)	15.84% (16)	100% (101)
Total	(250)	(136)	(386)

Pathway of Enrollment (Campus or Distance)

Of the 386 participants, 136 (35.23%) were enrolled in a distance pathway and 250 (64.77%) were enrolled in a campus pathway (see Figure 4.2).

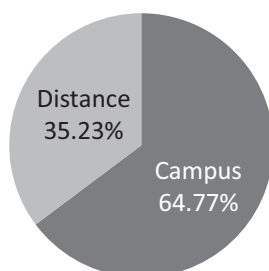


Figure 4.2. Demographic results: Percentage of participants in each pathway (Campus or Distance).

Further analysis of the distance participants indicates 16 (11.76%) were occupational therapy students and 120 (88.24%) were pharmacy students. Of the

students enrolled in the campus pathway 85 (34.00%) were occupational therapy students and 165 (66.00%) were pharmacy students. Table 4.3 summarizes these results.

Table 4.3. Distribution of Pharmacy and Occupational Therapy Students by Program

	Program		Total
	Pharmacy	Occupational Therapy	
Campus students	165 (57.89%)	85 (84.16%)	250 (100%)
Distance students	120 (42.11%)	16 (15.84%)	136 (100%)
Total	285 (100%)	101 (100%)	386

Year within the Program of Study

Regarding the students' current year in their program of study, 141 students (36.53%) reported being in Year 1, 135 (34.97%) reported being in Year 2, and 110 (28.50%) reported being in Year 3. A total frequency and percentage break down by year is represented in Figure 4.3.

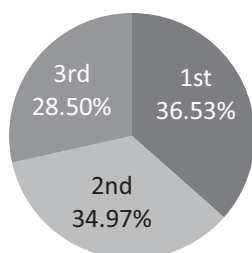


Figure 4.3. Demographic results: Percentage of participants in each year of their program of study.

Table 4.4 provides a summary of the pharmacy/occupational therapy student and on-ground/online student response distribution for each year of the program.

Table 4.4. Distribution of Online/On-Ground and Pharmacy/Occupational Therapy Students by Year

	Student		Program	
	Online	On-ground	Pharmacy	Occupational Therapy
1 st year	30.15% (41)	40.40% (101)	38.25% (109)	31.68% (32)
2 nd year	30.15% (41)	37.20% (93)	35.44% (101)	33.66% (34)
3 rd year	39.70% (54)	36.00% (91)	26.31% (75)	34.66% (35)

Average Number of Hours Employed Each Week

Students were asked to report the average number of hours they were employed each week during the current semester. Reporting used only whole numbers. Responses ranged from zero to 50 hours per week, with an average of all results reported equal to 12.78 hours. A frequency breakdown is represented in Figure 4.4.

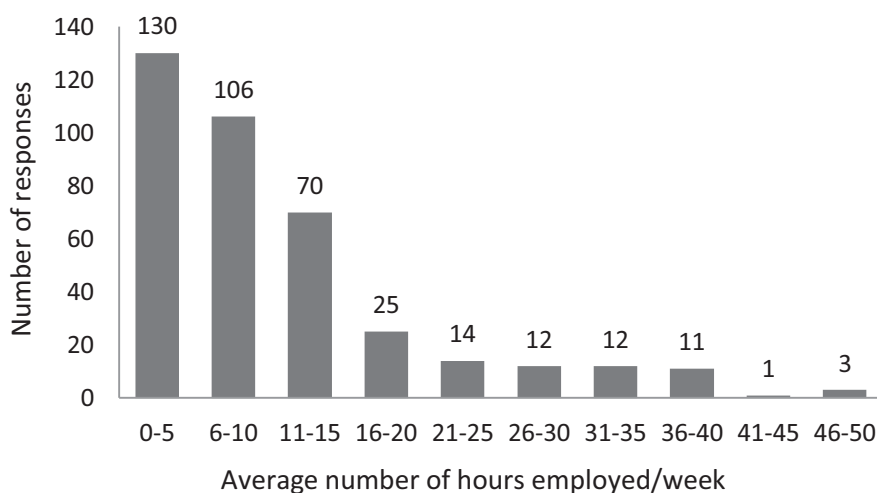


Figure 4.4. Demographic results: Average number of hours employed each week.

Table 4.5 provides descriptive statistical data for average hours employed per week for online/on-ground students as well as for pharmacy/occupational therapy students.

Table 4.5. Descriptive Statistics for Average Number of Hours Employed Per Week

	N	Mean	Standard Deviation	Range	
				Low	High
Online students	136	15.31	14.07	0	50
On-ground students	250	9.76	4.42	0	50
Pharmacy students	285	13.88	18.32	0	50
Occupational Therapy students	101	9.27	3.67	0	50
Entire student sample	386	15.09	11.44	0	50

Current Course Grade

Current course grade was self-reported by students as the grade they currently had in the course. Students unsure as to the grade they currently had were asked to estimate their current grade. Only letter grades were used (A, B, C, D, F). Results show 211 students (53.83%) reported having an A, 157 students (40.05%) reported having a B, 22 students (5.61%) reported having a C, 2 students (.51%) reported having a D, and zero students reported having an F. Figure 4.5 reports these results.

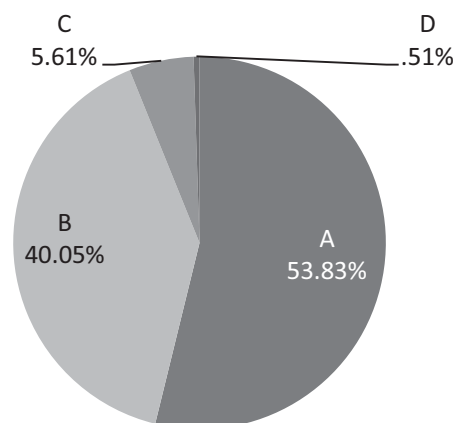


Figure 4.5. Demographic results: Participants' self report of current course grade.

Table 4.6 provides additional information on students' self reported estimated grade by breaking the grade distribution down for online/on-ground students and pharmacy/occupational therapy students.

Table 4.6. Distribution of Course Grades for Online/On-Ground and Pharmacy/Occupational Therapy Students

	Pathway		Program	
	Distance	Campus	Pharmacy	Occupational Therapy
A	64.72%(88)	49.20% (123)	58.25% (166)	42.58% (43)
B	31.62% (43)	43.20% (108)	34.74% (99)	53.46% (54)
C	3.66% (5)	6.80% (17)	6.31% (18)	3.96% (4)
D	0.00% (0)	0.80% (2)	0.70%(2)	0.00% (0)
F	0.00% (0)	0.00% (0)	0.00% (0)	0.00%(0)

Gender

With respect to gender, 117 students (30.63%) reported being male, while 265 (69.37%) reported being female. A total frequency and percentage breakdown by gender is represented in Figure 4.6.

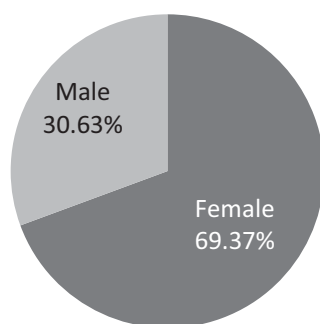


Figure 4.6. Demographic results: Percentage of participants for each gender type.

Among male students, 28.80% ($n=72$) report being on-ground students and 32.35% ($n=44$) report being online students. A total of 35.97% ($n=102$) of male students were enrolled in the pharmacy program and 13.86% ($n=14$) were occupational therapy students. Among female students 69.60% ($n=174$) were on-ground students and 66.91% ($n=91$) were online students. One hundred and seventy-eight (62.46%) were pharmacy students and 87 (86.14%) were occupational therapy students. Table 4.7 summarizes these results.

Table 4.7. Distribution of Online/On-Ground and Pharmacy/Occupational Therapy Students by Gender

	Pathway		Program	
	Distance	Campus	Pharmacy	Occupational Therapy
Female	66.91% (91)	69.60% (174)	62.46% (178)	86.14% (87)
Male	32.35% (44)	28.80% (72)	35.79% (102)	13.86% (14)
No report	0.74% (1)	1.60% (4)	1.75% (5)	0.00% (0)
Total	100% (136)	100% (250)	100% (285)	100% (101)

Age

Students were asked to report their current age as a whole number. The responses ranged from 20 to 54 with the overall average of all responses equal to 27 years of age.

Figure 4.7 provides a summary of these results.

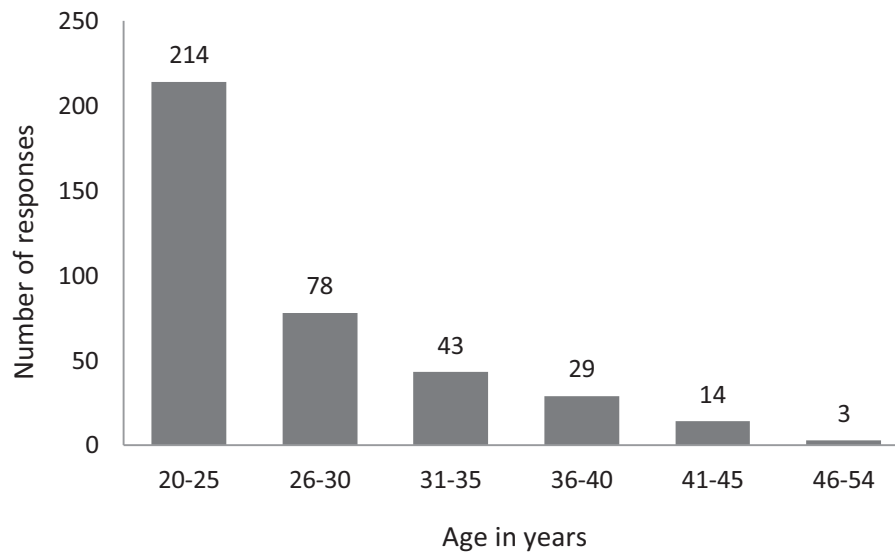


Figure 4.7. Demographic results: Number of participants' reported age for each age category.

Table 4.8 provides descriptive statistical data of age for online/on-ground students as well as for pharmacy/occupational therapy students.

Table 4.8. Descriptive Statistics for Students' Age in Years

	N	Mean	Standard Deviation	Range	
				Low	High
Distance pathway students	136	32.23	6.41	22	54
Campus pathway students	250	24.62	2.96	20	44
Pharmacy students	285	28.76	6.20	20	52
Occupational Therapy students	101	27.5	6.74	23	54

Demographic Data: Interpretation of Results

Analysis of the demographic data collected revealed that the majority (73.83%) of students participating in this study were enrolled in the pharmacy program. The proportion of pharmacy students to occupational therapy students to was approximately 4:1 (four pharmacy students for every occupational therapy student). The distribution of online and on-ground students among pharmacy participants was fairly even (57.89% on-ground and 42.11% online). However, among occupational therapy students the distribution was heavily skewed in favor of on-ground students (84.16% on-ground and 15.84% online).

Examining the allocation of participants between on-ground and online, one notices an approximately 3:1 ratio, 3 on-ground students for every online student. The

vast majority of the on-ground participants were pharmacy students (88.24%). The ratio of pharmacy to occupational therapy students among online students was about 2:1, two pharmacy students for every occupational therapy student (66.00% pharmacy to 34.00% occupational therapy).

The distribution of participants among the three years of the program was fairly even with approximately one-third of the students enrolled in each year of the program (1st year = 36.53%, 2nd year = 34.97%, 3rd year = 28.50%). This relatively equal allocation among the three years of the programs holds true when analyzed for pathway (online and on-ground) as well as program (pharmacy and occupational therapy).

The range for the average number of hours students were employed each week was reported as 0 to 50 with an average for all participants of 15.09 hours. Distance pathway students and pharmacy students reported the highest mean scores for average number of hours employed (15.31 and 13.88, respectively).

The vast majority (93.88%) of respondents reported a current grade of A or B. Online participant data showed an almost one-third /two-third split among As (64.72%) and Bs (31.62%) while on-ground student results were more evenly distributed (As = 49.20% and Bs = 42.20%). The A and B grade distribution between pharmacy and occupational therapy students illustrated a fairly even allocation for occupational therapy (As = 42.58% and Bs = 53.46%). Pharmacy results were slightly more uneven (As = 58.25% and Bs = 43.74%).

A little over two-thirds (69.37%) of the respondents were female. The proportion of male to female respondents was fairly consistent for the online students, on-ground

students and pharmacy students, indicating an approximate 3:1 ratio (3 females for every male). Occupational therapy student results were slightly more weighted in favor of females (86.14%).

Approximately two-thirds (61.14%) of the respondents were between the ages of 20-26, with an overall range of ages reported between 22 and 54. Online students reported the highest mean age score (32.23 years) and on-ground students the lowest mean age score (24.62) along with a standard deviation approximately half of that reported for distance pathway, pharmacy students, and occupational therapy students.

Classroom Community Scale Scores

Descriptive statistics were calculated for Classroom Community Scale scores for the entire sample of students as well as each sub-group. These statistics include mean score, standard deviation, and the range of scores and are presented in Table 4.9. Additionally, CCS mean scores and standard deviations from other studies are presented to provide comparative descriptive statistics.

Table 4.9. Descriptive Statistics for CCS Scores

	N	Mean	Standard Deviation	Range	
				Low	High
Online students	136	71.87	11.94	42	92
On-ground students	250	67.66	11.87	23	95
Pharmacy students	285	68.39	12.12	23	95
Occupational Therapy students	101	70.56	11.61	39	93
Entire student sample	386	68.96	12.01	23	95
Baturay & Bay, 2010	33	52.22	*	*	*
Dawson, 2008	464	47.5	11.00	*	*
Shea, 2006	2314	62.29	12.53	*	*

*Information not available

The CCS scores for this study ranged from 23 to 95 for the entire sample. The mean scores ranged from a high of 71.87 for online students to a low of 67.66 for on-ground students. CCS scores for individual participants could range from 20 to 100; responses for each item of the 20-item survey range from 1 to 5, with 1 being assigned to the least favorable option and 5 to the most favorable. The standard deviations for each group were similar; indicating the variability in scores among the groups was generally equal. CCS mean scores for other studies in which the CCS was used were lower than the mean scores in this study; however the standard deviations were similar.

Phase 1A: Confirm Student Variables Related to Sense of Community

Research question 1A asked, “Are student variables within the given set related to sense of classroom community?” The null hypotheses for this question stated, “The student variables are NOT related to sense of classroom community.” The alternative hypothesis stated, “The student variables ARE related to sense of classroom community.” This phase of the research study includes four sub-questions designed to identify:

1. Variables which have a significant relationship to sense of classroom community
2. Similarities or differences among online and on-ground students for variables found to have a significant relationship to community
3. Variables with significant relationships to feelings of classroom community for Doctor of Pharmacy and for Doctor of Occupational Therapy students.

Student variables examined in this phase of the study included pathway (online or on-ground), year in the program (1st, 2nd, 3rd), average number of hours employed each week during the semester (reported as a whole number), estimated grade in the course (A, B, C, D, F) gender (male or female), and age (reported as a whole number). Table 4.10 includes the coding scores assigned to student variables that were used in the SPSS analysis of the data.

Table 4.10. Coding Assigned to Student Variables for SPSS Analysis

Student variable	SPSS coding assignment
Pathway	
Campus	1
Distance	2
Year in the program	
1 st	1
2 nd	2
3 rd	3
Estimated grade in the course	
A	5
B	4
C	3
D	2
F	1
Gender	
Female	1
Male	2
Age – reported as a continuous variable	
Average hours employed/week - reported as a continuous variable	

The Classroom Community Scale (CCS) score was used to measure students' perception of overall classroom community. Scores for the CCS were computed by adding points assigned to survey items 1-20. Items were reverse-scored as needed such

that the least favorable option was assigned a value of 1 and the most favorable option was assigned a value of 5. Therefore, overall community scores for the entire survey could range from 20 to 100, with higher scores reflecting a stronger sense of classroom community.

The survey data were edited for completeness and duplication, then analyzed using the Statistical Package for Social Sciences (SPSSTM) data analysis software for Windows, Release Version 19.0, (© SPSS, Inc., 2011, Armonk, NY). The statistical analysis for this study was done in two phases. Each phase was progressive and matched the research questions posed. The level of significance for the study was $p < .05$. This level of significance was chosen as it is the level generally used in the literature.

Following is an explanation of the data analysis conducted to address Phase 1A of this study, including the central question as well as the sub-questions. Scatter plots were generated for student characteristic variables which had more than two possible values. Variables with only two possible values will always indicate a linear relationship and therefore a scatter plot does not provide any valuable information to the data analysis. Scatter plot diagrams were used to determine the direction (positive or negative) and form (linear or nonlinear) of the association between student variables and feeling of classroom community as measured by the Classroom Community Scale (CCS) score. Zero-order correlations were calculated to determine the degree of association between CCS scores and student variables. These types of correlations reflect the existence of a consistent, predictable association between the scores (Gravetter & Wallnau, 2009).

Coefficients of determination were generated and used to determine the proportion of variability in the CCS scores that can be explained by the student characteristic variables.

Student Variables Related to Sense of Community: Entire Sample

The purpose of data analysis in this phase was to find out which student variables have a significant relationship to sense of classroom community. This part of the data analysis included all participants, online and on-ground students, pharmacy and occupational therapy students.

The scatter plots (Figures 4.8 – 4.11) indicated positive linear associations exist between CCS scores and student characteristic variables of age, hours employed, estimated grade and year in the program. The variables of average hours employed and age were shown to have a less linear relationship to CCS scores than estimated grade and year in the program.

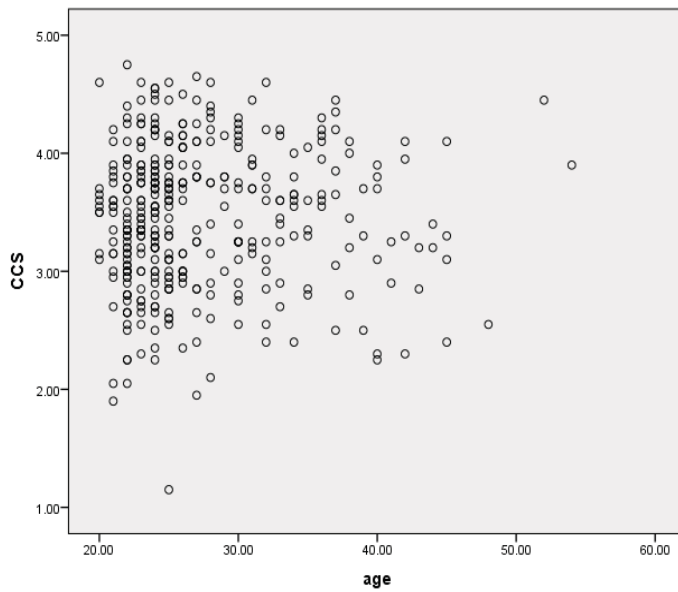


Figure 4.8. Distribution results ($N = 386$) for all students combined showing X (Age) variable and Y (CCS score) variable.

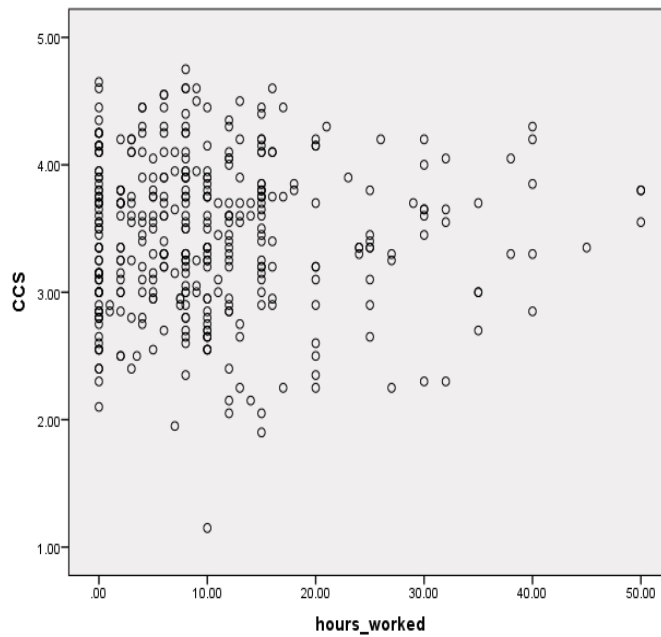


Figure 4.9. Distribution results ($N = 386$) for all students combined showing X (Hours Employed) variable and Y (CCS score) variable.

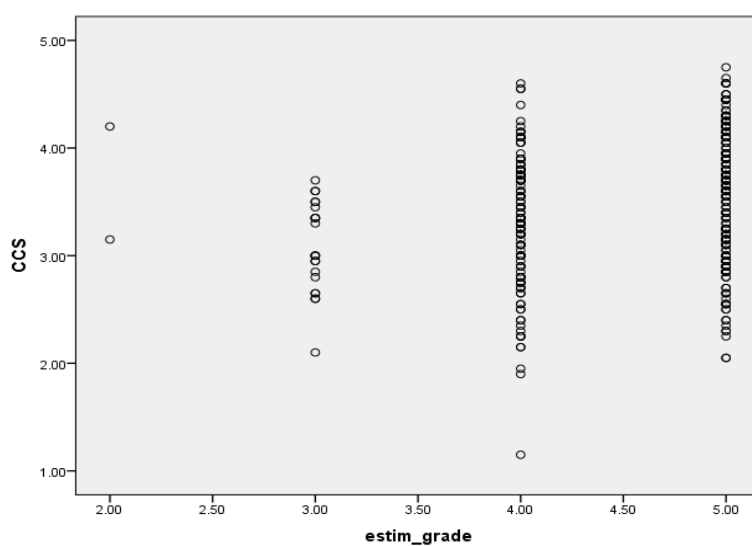


Figure 4.10. Distribution results ($N = 386$) for all students combined showing X (Estimated Grade) variable and Y (CCS score) variable.

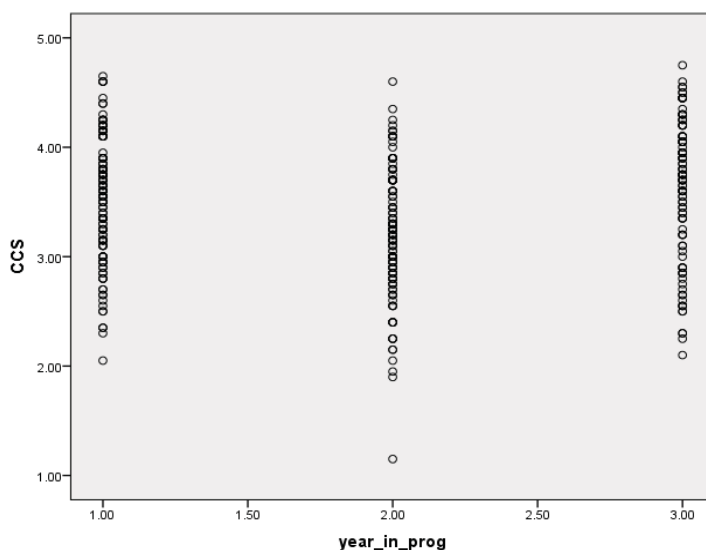


Figure 4.11. Distribution results ($N = 386$) for all students combined showing X (Year in the Program) variable and Y (CCS score) variable.

Zero-order correlations were calculated for each student variable and CCS scores.

These were examined to determine more specific information about the relationship between student variables and feelings of classroom community. The correlational

matrix presented in Table 4.11 and Table 4.12 includes the correlation coefficient for each student characteristics and the associated coefficient of determination.

Table 4.11. Correlation Matrix for Student Variables ($N = 386$) and CCS Score: Entire Sample

	1	2	3	4	5	6	7
1. CCS	1						
2. Pathway	.083	1					
3. Hours employed	.010	.240*	1				
4. Estimated grade	.218*	.125*	-.011	1			
5. Gender	.021	.049	.174*	.006	1		
6. Age	.018	.644*	.171*	.242*	.114*	1	
7. Year in the program	.087	.120*	.091	.174*	-.079	.179*	1

* $p < .05$

Table 4.12. Student Variables Coefficients of Determination for the Entire Sample ($N = 386$)

Student Characteristic Variable	r	r^2
Pathway enrollment	.083	.0069
Year in the program	.087	.0076
Number of hours employed	.010	.0001
Estimated course grade	.218*	.0475
Gender	.021	.0004
Age	.018	.0003

* $p < .05$

Estimated course grade was the most highly correlated ($r = .218$) and was the only student variable significantly related to the CCS scores. Although estimated course grade demonstrated the highest relationship to CCS scores of the student variables, it explained

only about 5% ($r^2 = .0475$) of the variability in the CCS scores. The significance of this correlation was likely due to sample size.

Similar coefficients were found for the variables of pathway enrollment and year in the program ($r = .083$ and $r = .087$, respectively) with each able to explain less than 1% ($r^2 = .0069$, $r^2 = .0076$) of the CCS scores. Gender, age, and number of hours employed ($r = .021$, $r = .018$, and $r = .010$, respectively) were found to be the least highly correlated to CCS scores.

Student Variables Related to Sense of Community: Online Students and On-ground Students

Similarities and differences in correlations for online and on-ground students were explored in this phase of the data analysis. Data for online students were examined first, followed by that for on-ground students. The conclusion of this section includes a comparison of the data from the two student groups.

Online student characteristics. The scatter plot diagrams for student variables of hours employed (Figure 4.12), estimated grade (Figure 4.13), age (Figure 4.14), and year in the program (Figure 4.15) are provided. A non-linear relationship with CCS scores was indicated for estimated hours worked and age and a linear association was noted for estimated grade and year in the program. The direction of the relationship is indicated for average number of hours worked, grade, and age.

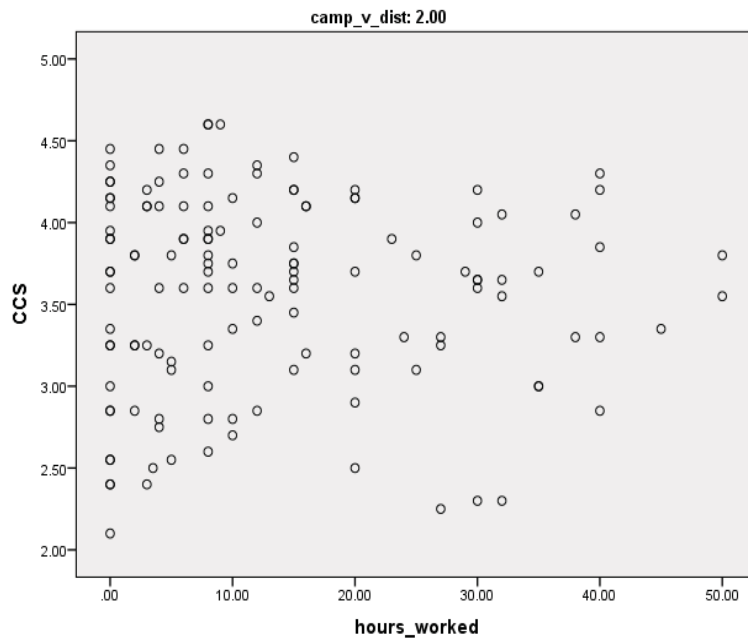


Figure 4.12. Distribution results ($n = 136$) for online students showing X (Hours Employed) variable and Y (CCS score) variable.

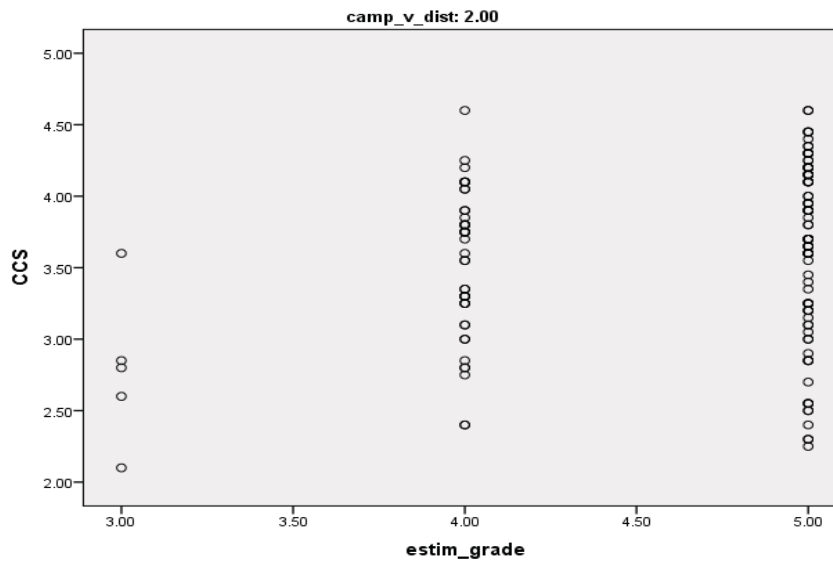


Figure 4.13. Distribution results ($n = 136$) for online students showing X (Estimated Grade) variable and Y (CCS score) variable.

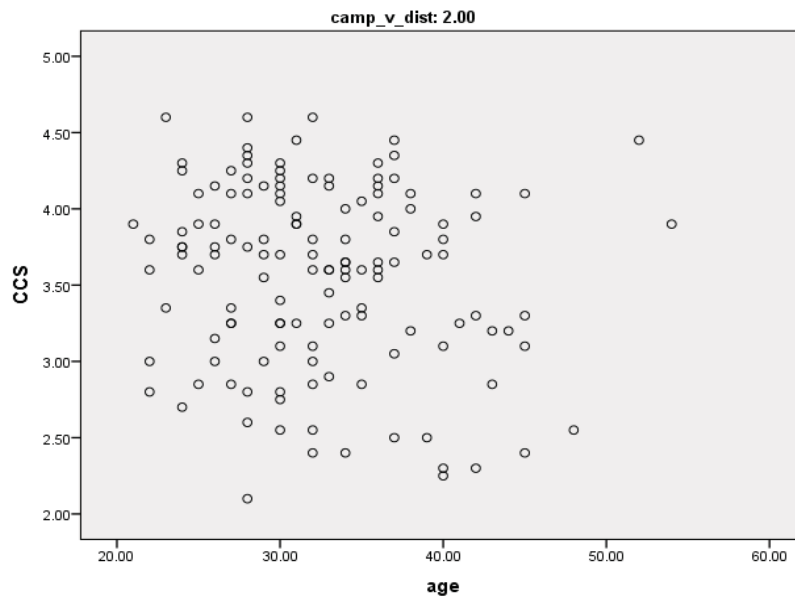


Figure 4.14. Distribution results ($n = 136$) for online students showing X (Age) variable and Y (CCS score) variable.

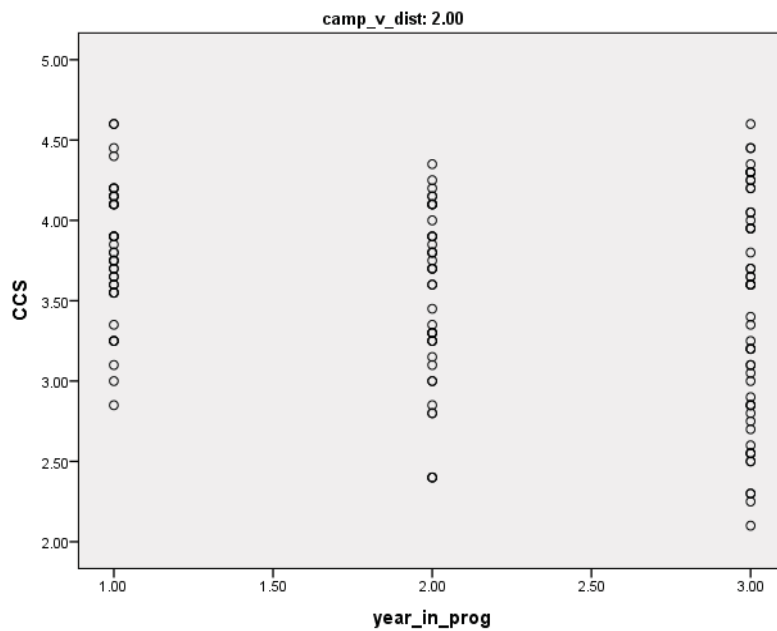


Figure 4.15. Distribution results ($n = 136$) for online students showing X (Year in the Program) variable and Y (CCS score) variable.

Data from online students were analyzed to determine zero-order correlations.

Data for all online students, those in the Doctor of Pharmacy and those in the Doctor of Occupational Therapy program, were combined to obtain these correlations. Correlations for online student data are presented in Table 4.13 and coefficient of determination data are presented in Table 4.14.

Table 4.13. Correlation Matrix for Online Student Variables and CCS Score
($n = 136$)

	1	2	3	4	5	6
1. CCS	1					
2. Hours employed	-.007	1				
3. Estimated grade	.282*	.003	1			
4. Gender	.239*	.345*	.021	1		
5. Age	-.085	.008	.304*	.000	1	
6. Year in program	-.313*	.005	.126	-.129	.127	1

* $p < .05$

Table 4.14. Online Student Variables Coefficients of Determination
($n = 136$)

Student Characteristic Variable	r	r^2
Year in the program	-.313*	.0980
Number of hours employed	-.007	.0001
Estimated course grade	.282*	.0795
Gender	.239*	.0571
Age	-.085	.0072

* $p < .05$

Student variable year in the program was determined to have the highest correlation ($r = .313$) to sense of classroom community among the online students. This student variable was found to have a negative and significant relationship to feelings of classroom community and can be used to explain approximately 10% ($r^2 = .0980$) of the

variability in CCS score variance for online students. The negative direction of the relationship suggested that as student progressed through their program their feelings of community tended to decrease.

Similar connections to the CCS score variability were found with estimated course grade and gender which had correlations of $r = .282$ and $r = .239$, respectively. Both characteristics were found to have a positive and significant relationship to CCS score variability with estimated course grade responsible for about 8% ($r^2 = .0795$) of the variability and gender accounting for about 6% ($r^2 = .0571$). The positive correlation between estimated grade and CCS scores indicated that those with higher grades were likely to experience higher levels of community. A positive correlation for gender suggested that males tended to have higher levels of community than females.

The lowest correlations were found for age ($r = .085$) and number of hours employed ($r = .007$). Neither of these variables was found to have a significant association with classroom community scale score variance.

On-ground student characteristics. Analysis of survey data for all on-ground students, those in the Doctor of Pharmacy program and those in the Doctor of Occupational Therapy, was conducted to identify correlations with feelings of community as measured by the CCS scores. As with the data for the online students, combining data for on-ground students in both programs was necessary in order to investigate similarities or differences among online and on-ground student characteristics associated with feelings of community.

The scatter plot diagrams for on-ground student data include average number of hours employed (Figure 4.16), estimated course grade (Figure 4.17), age (Figure 4.19) and year in the program (Figure 4.19). A somewhat negative relationship between feelings of classroom community and age was suggested, although the direction of the relationship between CCS score and number of hours employed was not clearly indicated on the scatter plot. A linear relationship was not indicated for either variable.

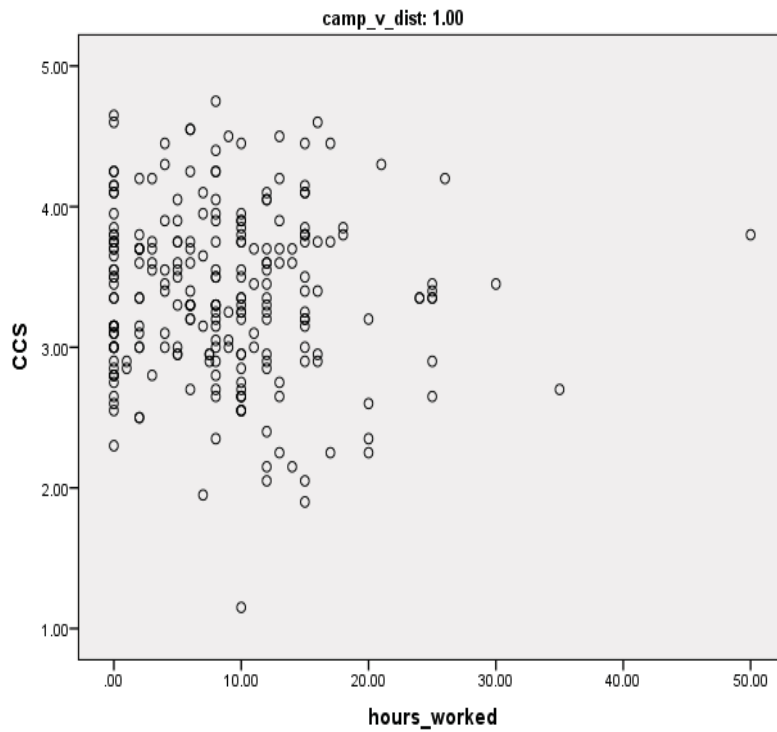


Figure 4.16. Distribution results ($n = 250$) for on-ground students showing X (Hours Employed) variable and Y (CCS score) variable.

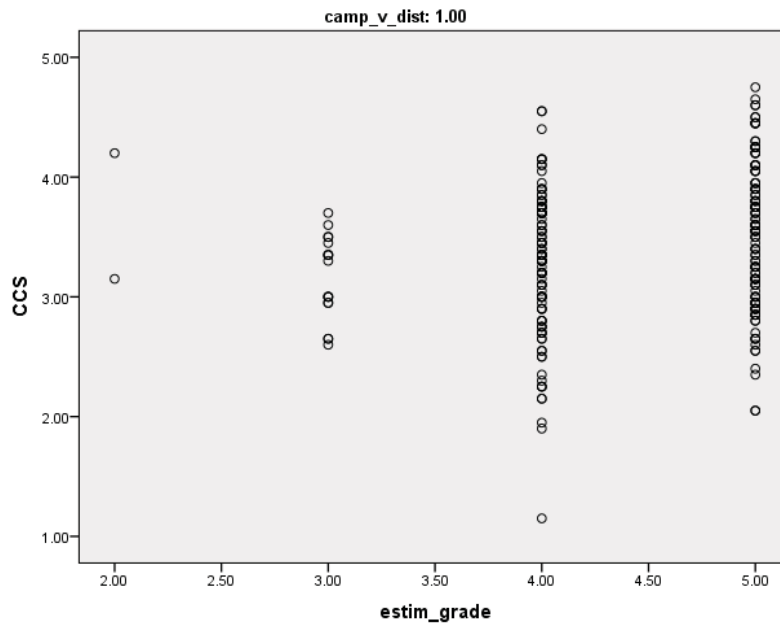


Figure 4.17. Distribution results ($n = 250$) for on-ground students showing X (Estimated Grade) variable and Y (CCS score) variable.

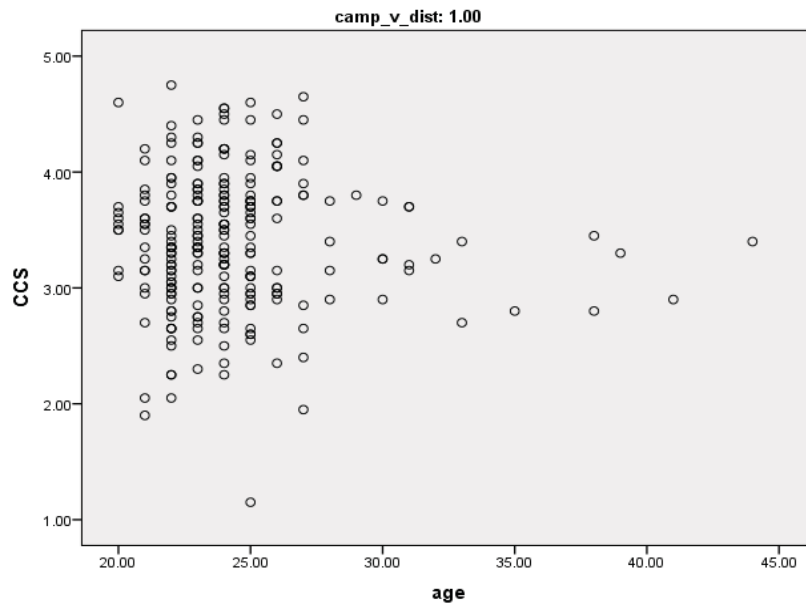


Figure 4.18. Distribution results ($n = 250$) for on-ground students showing X (Age) variable and Y (CCS score) variable.

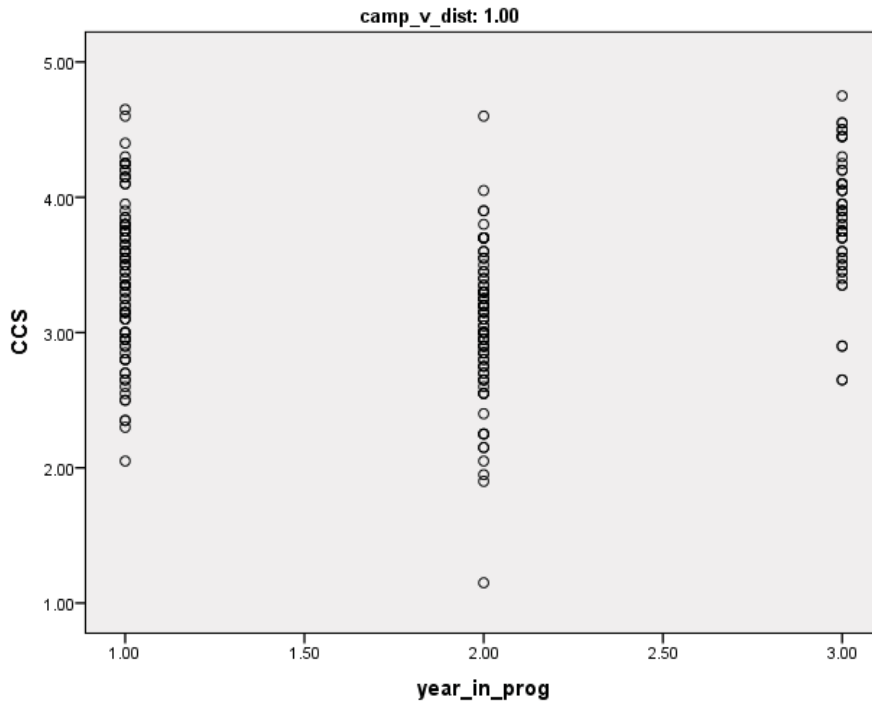


Figure 4.19. Distribution results ($n = 250$) for on-ground students showing X (Year in the Program) variable and Y (CCS score) variable.

On-ground student data was used to calculate zero-order correlations as well as coefficients of determination. The correlations for on-ground student data are presented in Table 4.15 and coefficient of determination data are presented in Table 4.16.

Table 4.15. Correlation Matrix for On-Ground Student Variables and CCS Score ($n = 250$)

	1	2	3	4	5	6
1. CCS	1					
2. Hours employed	-.017	1				
3. Estimated grade	.166*	-.095	1			
4. Gender	-.113	.009	-.014	1		
5. Age	-.002	.059	.169*	.244*	1	
6. Year in program	.286*	.121*	.175*	-.058	.176*	1

* $p < .05$

Table 4.16. On-Ground Student Variables Coefficients of Determination ($n = 250$)

Student Characteristic Variable	r	r^2
Year in the program	.286*	.0818
Number of hours employed	-.017	.0003
Estimated course grade	.166*	.0276
Gender	-.113	.0128
Age	-.002	.0000

* $p < .05$

The highest correlation ($r = .286$) existed between the student characteristic year in the program and the CCS score, followed by estimated course grade ($r = .166$). Both of these characteristics were found to have a significant and positive association to students' feeling of classroom community. Approximately 8% ($r^2 = .0818$) of the variability in the CCS scores for on-ground students was predicted by their year in the program and almost 3% ($r^2 = .0276$) was accounted for by their grade. The student characteristic 'gender' had the third highest correlation ($r = -.113$) to feelings of community among on-ground students, with number of hours employed ($r = -.017$) and age ($r = -.002$) ranked as fourth and fifth, respectively. Gender explained only about 1% ($r^2 = .0128$) of the CCS score variability while neither number of hours employed nor age explained score variability. Gender, hours employed, and age did not demonstrate a significant relationship to CCS score variability.

Comparing online and on-ground student characteristics. Zero-order correlations indicated the variables of year in the program and estimated grade were significantly correlated to CCS scores for both online and on-ground students. However,

the direction of the relationship between CCS scores and year in the program for the two groups of students differed; online students showed a negative correlation and on-ground students a positive, having the highest correlations to CCS scores. This finding suggests that as online students progressed in their program of study their feelings of community decreased, while the opposite was indicated for on-ground students. Gender was shown to have a significant connection to CCS scores for online students but not for on-ground students. Table 4.17 summarizes the significant and non-significant correlational analysis findings for online and on-ground students.

Although several statistically significant correlations between the independent variables and CCS scores were found, each was relatively weak. The presence of statistical significance but weak correlations may be a result of the study's high degree of power due to the sample size. The use of multiple regression analysis to address this situation is discussed in the Phase 1: Interpretation of Results section of this chapter.

Table 4.17. Summary of Correlational Analysis Findings for Online and On-Ground Students

	Online Student Characteristics	On-ground Student Characteristics
Negative association	Age Year in program* Grade*	Age Hours employed Gender*
Positive association	Hours employed Gender*	Year in program* Estimated grade*
Significant association	Year in program Grade Gender	Year in program Grade
Non-significant association	Age Hours employed	Age Hours employed Gender

*significant correlation

Student Variables Related to Sense of Community: Doctor of Pharmacy Students

As with the examination of the data for online and on-ground students, scatter plots (Figures 4.20, 4.21, 4.22, 4.23) were used to identify the general direction (negative or positive) of the relationship between pharmacy student characteristics and feelings of community as well as the form of the relationship (linear or non-linear). Also congruent with the scatter plot use for online and on-ground students, only student variables with more than two possible values were used.

Neither the form nor the direction of the relationships between CCS scores and age or hours employed was indicated by the diagrams. Positive and linear relationships

were suggested between year in the program and CCS scores as well as estimated grade and CCS scores.

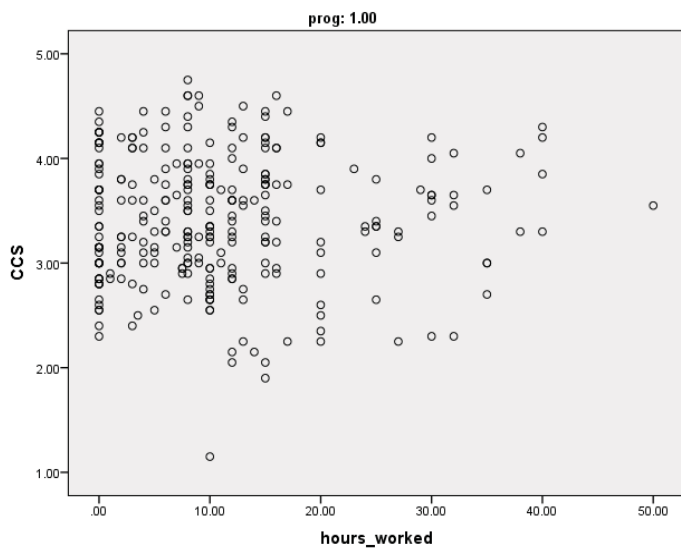


Figure 4.20. Distribution results ($n = 285$) for pharmacy students showing X (Hours Worked) variable and Y (CCS score) variable.

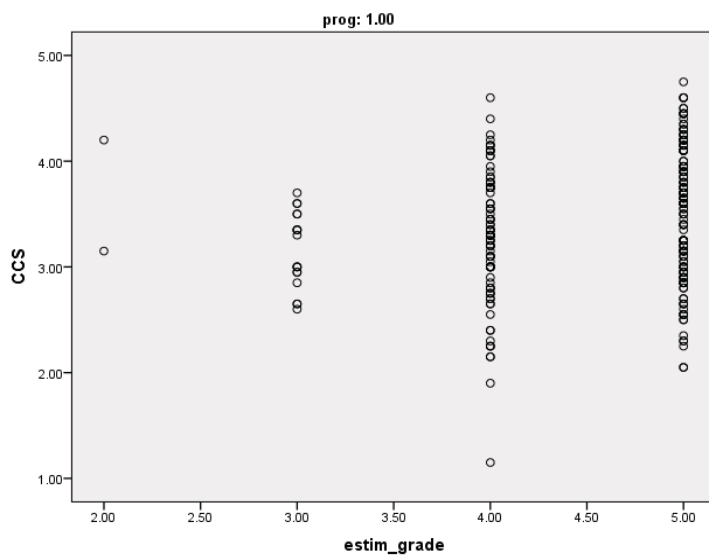


Figure 4.21. Distribution results ($n = 285$) for pharmacy students showing X (Estimated Grade) variable and Y (CCS score) variable.

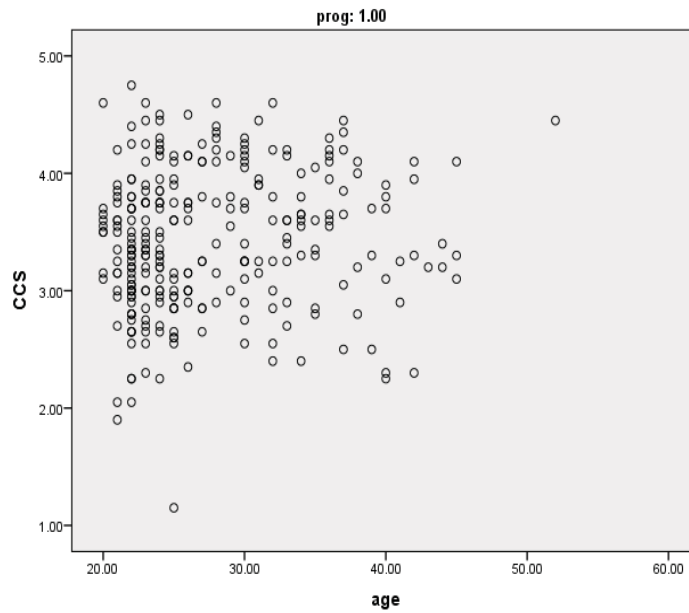


Figure 4.22. Distribution results ($n = 285$) for pharmacy students showing X (Age) variable and Y (CCS score) variable.

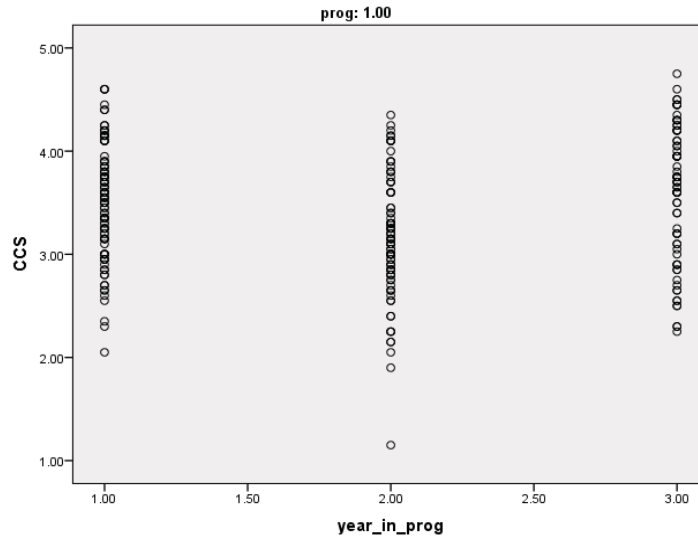


Figure 4.23. Distribution results ($n = 285$) for pharmacy students showing X (Year in the Program) variable and Y (CCS score) variable.

Pharmacy student data were used to calculate zero-order correlations as well as coefficients of determination. The correlation matrix is presented in Table 4.18 and coefficient of determination data are presented in Table 4.19.

Table 4.18. Correlation Matrix for Pharmacy Student Variables and CCS Score
($n = 285$)

	1	2	3	4	5	6	7
1. CCS	1						
2. Pathway	.284*	1					
3. Hours employed	.015	.228*	1				
4. Estimated grade	.187*	.208*	-.014	1			
5. Gender	.048	-.024	.206*	-.077	1		
6. Age	.110	.651*	.201*	.256*	.086	1	
7. Year in program	.031	.226*	.097	.337*	.028	.297*	1

* $p < .05$

Table 4.19. Correlation Coefficients for Pharmacy Student Variables
($n = 285$)

Student Characteristic Variable	r	r^2
Pathway	.284*	.0807
Year in the program	.031	.0009
Number of hours employed	.015	.0002
Estimated course grade	.187*	.0350
Gender	.048	.0023
Age	.110	.0121

* $p < .05$

Pathway (campus or distance) had the highest correlation ($r = .284$) to feelings of classroom community among the pharmacy students followed by estimated course grade ($r = .187$). Both of these student characteristics were found to have a significant

relationship to the CCS scores. Eight percent ($r^2 = .0807$) of the variances in the pharmacy students' CCS scores were explained by the student's pathway, whether they are a distance or campus student. Estimated course grade accounted for 3.5% ($r^2 = .0350$) of the CCS score variances. Correlations for student characteristics of age ($r = .110$), gender ($r = .048$), year in the program ($r = .031$), and number of hours employed ($r = .015$) were not found to be significant.

Student Variables Related to Sense of Community: Doctor of Occupational Therapy students

Scatter plot diagrams (Figures 4.24, 4.25, 4.26, 4.27) illustrate a linear and somewhat positive relationship between students' feelings of community and the student variables of estimated course grade as well as year in the program. Neither hours employed nor age revealed a linear relationship to CCS scores. A weak negative association was noted for age and CCS scores; however the direction (positive or negative) of the relationships for hours employed could not be determined by the scatter plots.

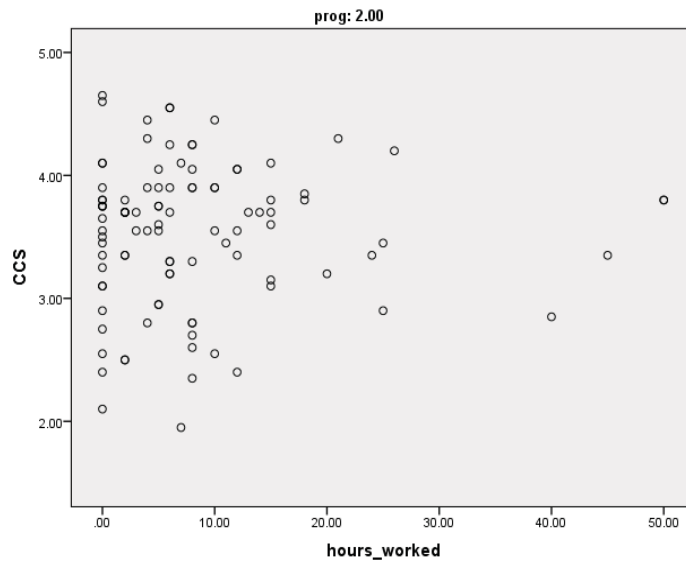


Figure 4.24. Distribution results ($n = 101$) for occupational therapy students showing X (Hours Worked) variable and Y (CCS score) variable.

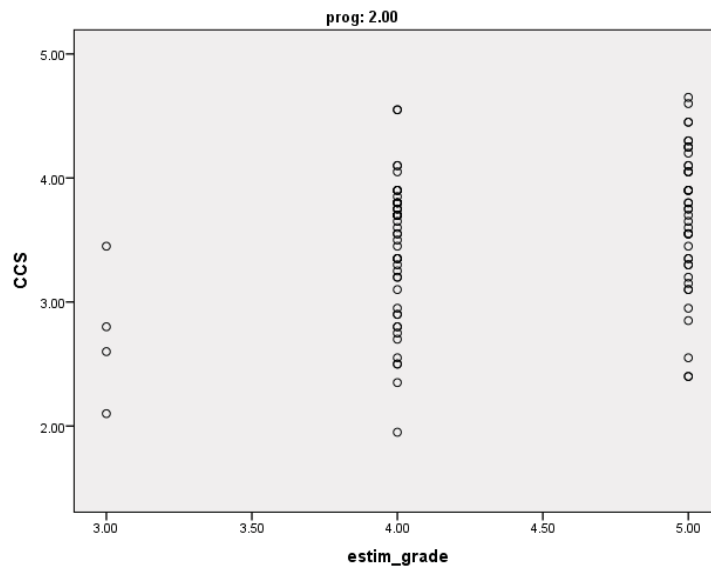


Figure 4.25. Distribution results ($n = 101$) for occupational therapy students showing X (Estimated Grade) variable and Y (CCS score) variable.

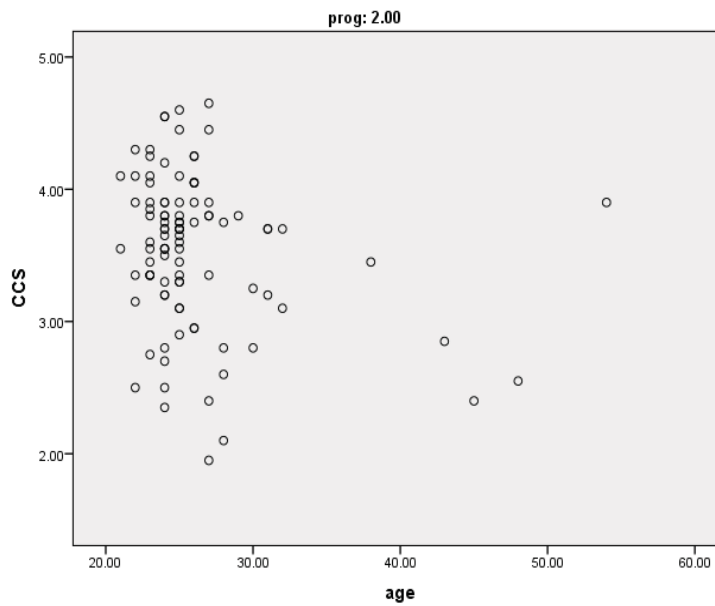


Figure 4.26. Distribution results ($n = 101$) for occupational therapy students showing X (Age) variable and Y (CCS score) variable.

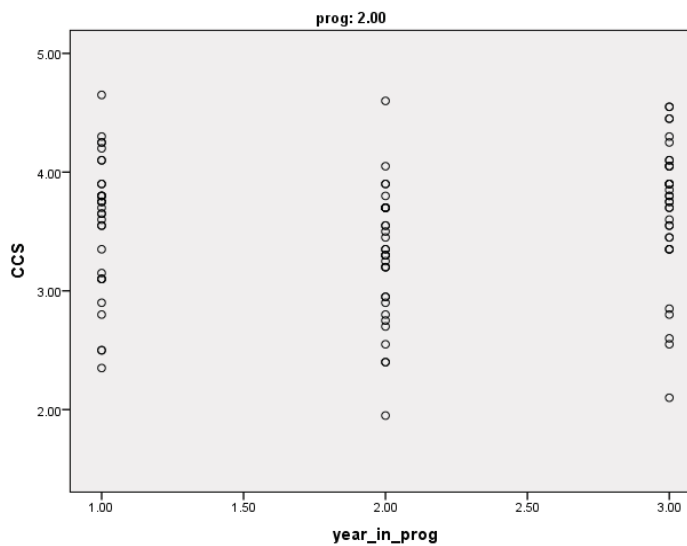


Figure 4.27. Distribution results ($n = 100$) for occupational therapy students showing X (Year in the Program) variable and Y (CCS score) variable.

Occupational therapy student data were used to calculate zero-order correlations as well as coefficients of determination. The correlations are presented in Table 4.20 and coefficient of determination data are presented in Table 4.21.

Table 4.20. Correlation Matrix for Occupational Therapy Student Variables and CCS Score ($n = 101$)

	1	2	3	4	5	6	7
1. CCS	1						
2. Pathway	-.365*	1					
3. Hours employed	.026	.238*	1				
4. Estimated grade	.340*	-.213*	-.029	1			
5. Gender	.069	.014	.036	.172*	1		
6. Age	-.156	.608*	.077	.173*	.100	1	
7. Year in program	.130	.093	.143	-.096	-.184*	.030	1

* $p < .05$

Table 4.21. Correlation Coefficients for Occupational Therapy Student Variables ($n = 101$)

Student Characteristic Variable	r	r^2
Pathway	-.365*	.1332
Year in the program	.130	.0169
Number of hours employed	.026	.0007
Estimated course grade	.340*	.1156
Gender	.130	.0169
Age	-.156	.0243

* $p < .05$

Pathway ($r = -.365$) and estimated course grade ($r = .340$) were the most highly correlated with CCS scores and were both found to be significantly associated with occupational therapy students' feelings of classroom community. Approximately 13% ($r^2 = .1332$) of the variances in CCS scores were attributed to the students' pathway and

about 12% ($r^2 = .1156$) was associated with students' estimated course grade. Pathway was found to be negatively correlated with CCS scores while estimated course grade had a positive correlation. The negative correlation for the pathway variable signified that students in the distance pathway experienced lower levels of community. The positive correlation found for the variable estimated course grade suggested that higher grades are associated with higher levels of community.

Non-significant correlations were found for age, year in program, gender and number of hours employed. Of these, age was negatively correlated to feeling of community ($r = -.156$). Degree of correlation with CCS scores for year in the program and gender were equal ($r = .130$) followed by number of hours employed ($r = .026$).

Phase 1A: Interpretation of Results

Analysis of the scatter plot diagrams and the zero-order correlations indicated the null hypothesis for Phase 1A of the study should be rejected. The null hypotheses stated, "The student variables within the given set are not related to sense of classroom community." Correlational analysis demonstrated that in fact, when the data for the entire sample of students were examined as well as for each sub-group, at least one variable was significantly related to community. However, the correlations were small and the findings may be due to chance. Phase 2 of this study further explored the relationship of the student variables to CCS scores.

The significant and positive relationship between CCS scores and students' estimated course grade for the entire student sample as well as for each sub-group

suggested that students expecting higher course grades tended to have higher feelings of community. Although this finding spanned all sub-groups used in the study, the correlations were low and can account for only 3%-12% of the variability in classroom community scale scores.

Findings for both online and on-ground students indicated that students' year in their program of study was a significant predictor of CCS scores. A negative relationship between CCS scores and year in the program was found for online students while a positive relationship was revealed for on-ground students. A negative correlation for year in the program and CCS scores suggests that as students matriculate through their program of study their feelings of community decrease. The applicability of this finding to the pharmacy and occupational therapy sub-groups as well as to the overall student sample is unknown since the findings for these groups were not significant. The negative correlation between year in the program and CCS scores for online students was surprising. All students in the study are part of a cohort moving through their program of study together. As students work and learn together it is assumed they would develop bonds with other students resulting in an increased sense of belongingness. Why this does not appear to be the case for the online students is a topic for additional investigation. Correlations for the entire student sample as well as each student sub-group were low, accounting for 1%-10% of the variability in CCS scores.

The student variable pathway of enrollment (campus or distance) showed a significant but weak correlation to CCS scores for both pharmacy and occupational

therapy students. The direction of the relationship was positive for pharmacy students and negative for occupational therapy students. The finding indicates that online pharmacy students feel more sense of community than their on-ground counterparts, but online occupational therapy students feel less sense of community than those enrolled in the campus pathway. The outcome for pharmacy students is unexpected as the literature overwhelmingly indicates online students tend to feel isolated and experience lower feelings of being part of a community of learners (Conrad & Donaldson, 2004; Haythornthwaithe, Kazmer, Robins, & Shoemaker, 2000; Kazmer, 2004; McPherson & Nunes, 2004; Twigg, 1997).

Correlational analysis indicated the relationship of gender to community was significant for only one sub-group, online students. The positive relationship between gender and community among online students signified that males tended to have higher sense of classroom community than females, a finding that is contrary to current literature which suggests females tend to be more relational and experience higher feelings of community (Abedin et al., 2010; Rovai, 2002b).

Neither number of hours employed nor age were found to be significantly related to community for the student sample as a whole or for any of the sub-groups. Students' age did not appear to have a relationship to their sense of classroom community. Furthermore, feelings of community did not appear to be impacted by the number of hours students spend working at a job outside of their school activities.

Although statistically significant relationships were found between some variables and CCS scores, the correlations were low; therefore the meaningfulness or practical significance of the relationships needs further investigation. Examination of statistical significance addresses whether study results are due to chance or sampling variability while practical significance addresses real world usefulness of the results (Kirk, 1996). Null hypotheses testing can be supplemented with additional measures to identify the strength of the association between dependent and independent variables. These measures can be used to address practical significance; one such measure is strength of association (Kirk, 1996). Phase 2 of this study uses multiple regression analysis as an additional measure to address strength of the relationship between the independent variables (course variable and student variables) and the dependent variable (CCS scores).

Phase 1B: Confirm Course Variables Related to Sense of Community

Research question 1B asked, “Are course variables within the given set related to sense of classroom community?” This phase of the research study included four sub-questions designed to identify:

1. Course variables which have a significant relationship to sense of classroom community.
2. Similarities or differences among online and on-ground students for course variables found to have a significant relationship to community.
3. Course variables with significant relationships to feelings of classroom community for Doctor of Occupational Therapy students.

4. Course variables with significant relationships to feelings of classroom community for Doctor of Pharmacy students.

Six courses were used in the study, (1) Pharmaceutics II: Sterile and Non-sterile Dosage Forms, (2) Foundations of Public Health, (3) Ethics in the Health Care Professions, (4) Introduction to Health Care Ethics, (5) Research Process II: Research Proposal, and (6) Critical Analysis of Occupational Therapy. Three courses employed mainly cognitive student learning outcomes and three primarily used affective outcomes. Three courses were part of the Doctor of Pharmacy curriculum and three were included in the Doctor of Occupational Therapy curriculum. Table 4.22 lists the courses included in the study as well as the primary type of learning outcome and the program with which the course is associated.

Table 4.22. Courses Included in the Study, Primary Type of Learning Outcome and the Program Association

Course Name	Program of study	Program Year	Learning Outcome Type
Pharmaceutics II: Sterile and Non-sterile Dosage Forms	Pharmacy	1	Cognitive
Foundations of Public Health	Pharmacy	2	Cognitive
Ethics in the Health Care Professions	Pharmacy	3	Affective
Introduction to Health Care Ethics	Occupational Therapy	1	Affective
Research Process II: Research Proposal	Occupational Therapy	2	Cognitive
Critical Analysis of Occupational Therapy Practice	Occupational Therapy	3	Affective

Course variables examined in this phase of the study included (1) amount of small group work used in the course, (2) type of learning outcome (cognitive or affective) identified for the course by the course syllabus, and (3) difficulty of the course's subject matter. The amount of small group work was categorized based upon the frequency during the semester that small group assignments were used in the course. Categories used for this variable included (1) four times per semester, (2) five times per semester, (3) seven times per semester, or (4) weekly. Difficulty of the subject matter was determined by responses to the survey item asking students to indicate the level of difficulty of the subject matter. Response choices were (1) very difficult, (2) difficult, (3) easy, or (4)

very easy. Table 4.23 includes the coding scores assigned to course variables which were used in the SPSS analysis of the data.

Table 4.23. Coding Assigned to Course Variables for SPSS Analysis

Course variable	SPSS coding assignment
<i>Subject matter difficulty</i>	
very easy	1
easy	2
difficult	3
very difficult	4
<i>Amount of small group work</i>	
4 times/semester	1
5 times/semester	2
7 times per semester	3
weekly	4
<i>Learning outcome type</i>	
affective	1
cognitive	2

As with Phase 1A of the study, the CCS score was used in Phase 1B to determine the level of classroom community among study participants. Scoring for the CCS was conducted in the same manner as for Phase 1A.

A fourth course variable, the percentage of students in a course receiving a grade of D or F, was originally included in the study. The percentage of students receiving a D or F was determined by using all final grades assigned in the course for the last five years. The time span of the last five years was selected as the Office of Academic and Student Affairs is able to access final grades for each course beginning in 2005. If the grading scale used to assign grades within a course had changed, the percentage of Ds or Fs was calculated using all final grades assigned in the course from the first semester in which the new grading scale was used. This variable was ultimately not used in the study as there were not enough Ds and Fs in the sample to make analysis viable.

A description of Phase 1B data analysis which addresses the central question as well as the sub-questions follows. Scatter plot diagrams were not used for Phase 1B due to the small number of possible responses for each survey item. Zero-order correlations and coefficients of determination were calculated to determine the degree and strength of the relationship between each course characteristic variable and CCS scores.

Course Variables Related to Sense of Community: Entire Sample

This phase of the data analysis examined data from the entire sample to determine which course variables revealed a significant relationship to feelings of community. Zero-order correlations and coefficients of determination were calculated using course variable data. The correlations are presented in Table 4.24 and coefficient of determination data is presented in Table 4.25.

Table 4.24. Correlation Matrix for Course Variables and CCS Score

	1	2	3	4
1. CCS	1			
2. Amount of small group work	-.059	1		
3. Course difficulty	.135*	-.548*	1	
4. Learning outcome type	.243*	.477*	.094	1

* $p < .05$

Table 4.25. Correlation Coefficients for Course Variables

Course Characteristic Variable	r	r^2
Amount of small group work	-.059	.0035
Course difficulty	.135*	.0182
Learning outcome type	.243*	.0590

* $p < .05$

Course difficulty and learning outcome type were both shown to be positively and significantly related to sense of community, with learning outcome type having the highest level of association ($r = .243$) followed by course difficulty ($r = .135$). This positive correlation indicated that higher levels of community were experienced in more difficult courses and in courses with cognitive types of course outcomes. The coefficient of determination (r^2) indicated learning outcome type accounted for approximately 6% of the variances in feelings of community ($r^2 = .0590$) among study participants and course difficulty ($r^2 = .0182$) accounted for approximately 2%. The amount of small group work did not demonstrate a significant relationship to sense of community.

Course Variables Related to Sense of Community: Campus and Distance Courses

Similarities and differences in course variables with significant relationships for campus and distance courses were explored in this phase of the data analysis. Distance courses were examined first followed by campus courses. A comparison of the data from the two groups concludes the section.

Course variables related to sense of community: Distance courses. Course characteristics for distance courses were examined in this part of the study. The correlations presented in Table 4.26 and coefficient of determination data presented in Table 4.27 provide an analysis of distance course variables.

Table 4.26. Correlation Matrix for Course Variables and CCS Score: Distance Courses

	1	2	3	4
1. CCS	1			
2. Learning outcome type	.196*	1		
3. Subject matter difficulty	-.165	.007	1	
4. Amount of small group work	-.189*	-.523*	-.269*	1

* $p < .05$

Table 4.27. Correlation Coefficients for Course Variables: Distance Courses

Course Characteristic Variable	r	r^2
Learning outcome type	.196*	.0384
Subject matter difficulty	-.165	.0272
Amount of small group work	-.189*	.0357

* $p < .05$

Significant relationships between CCS scores and learning outcome type as well as amount of small group work were found. Of the variables with a significant relationship, the highest level of association was found for learning outcome type ($r =$

.196) followed by amount of small group work ($r = -.189$). Learning outcome type was positively related to CCS scores, suggesting that students in courses with mainly cognitive types of outcomes experienced higher levels of community. Amount of small group work and feelings of classroom community were shown to be negatively related. The direction of this relationship indicated as the amount of small group work increased feelings of community decreased. The coefficient of determination (r^2) indicated that learning outcome type accounted for approximately 4% ($r^2 = .0357$) of the variances in CCS scores and the amount of small group work explained approximately 4% ($r^2 = .0361$) of the variances for distance courses. Subject matter difficulty was shown to have a negative but non-significant relationship to CCS scores.

Course variables related to sense of community: Campus courses. Campus course characteristics were investigated in this part of the study. The correlations presented in Table 4.28 and coefficient of determination data presented in Table 4.29 provide an analysis of course variables for campus courses.

Table 4.28. Correlation Matrix for Course Variables and CCS Score: Campus Courses

	1	2	3	4
1. CCS	1			
2. Learning outcome type	-.456*	1		
3. Subject matter difficulty	.130*	-.021	1	
4. Amount of small group work	-.027	-.486*	-.254*	1

* $p < .05$

Table 4.29. Correlation Coefficients for Course Variables: Campus Courses

Course Characteristic Variable	r	r^2
Learning outcome type	-.456*	.2079
Subject matter difficulty	.130*	.0169
Amount of small group work	-.027	.0007

* $p < .05$

Learning outcome type and subject matter difficulty were shown to have significant relationships to CCS scores, with learning outcome type having the highest level of association ($r = -.456$) followed by subject matter difficulty ($r = .130$). A negative relationship was illustrated between learning outcome type and CCS scores implying that, contrary to the findings for distance courses, campus courses with primarily cognitive outcomes tended to have lower community scores. Subject matter difficulty was shown to be positively related to CCS scores signifying higher levels of subject matter difficulty were related to higher feelings of community. The coefficient of determination (r^2) indicated learning outcome type accounted for approximately 20% ($r^2 = .2079$) of the variances in CCS scores and subject matter difficulty explained approximately 2% ($r^2 = .0169$) of the variances for campus courses. The amount of small group work in a course demonstrated a negative but non-significant relationship to CCS scores.

Course variables related to sense of community: Comparing distance and campus characteristics. Analysis of zero-order correlations for campus and distance courses indicated learning outcome type is significantly related to CCS scores for both

campus and distance courses and had the highest correlation for both groups as well. A significant relationship between community and amount of small group work was indicated for distance courses but not for campus courses. Difficulty of subject matter was shown to be significantly related to community for campus courses but was not the case for distance courses. A negative correlation between community scores and amount of small group work for both campus and distance courses was found. Positive correlation was found between CCS scores and learning outcome type for distance courses but not for campus courses. Alternately, a negative correlation was indicated for subject matter difficulty in distance courses which was not the case in campus courses. A summary of the findings for campus and distance courses is provided in Table 4.30.

Table 4.30 Summary of Course Variables Findings for Campus and Distance Courses

	Campus Course Characteristics	Distance Course Characteristics
Negative Correlation	Learning outcome type* Amount of small group work	Subject matter difficulty Amount of small group work*
Positive Correlation	Subject matter difficulty*	Learning outcome type*
Significant relationship	Learning outcome type Subject matter difficulty	Learning outcome type Amount of small group work
Non-significant relationship	Amount of small group work	Subject matter difficulty

*significant correlation

Course Variables Related to Sense of Community: Pharmacy Courses

This component of the study addressed pharmacy course characteristics. Table 4.31 and 4.32 present the correlation coefficient and coefficient of determination data, respectively.

Table 4.31. Correlation Matrix for Pharmacy Course Variables and CCS Score

	1	2	3	4
CCS	1			
Learning outcome type	-.191*	1		
Subject matter difficulty	-.045	.174*	1	
Amount of small group work	-.123*	-.473*	-.325*	1

* $p < .05$

Table 4.32. Correlation Coefficients for Pharmacy Course Variables

Course Characteristic Variable	r	r^2
Learning outcome type	-.191*	.0365
Subject matter difficulty	-.045	.0020
Amount of small group work	-.123*	.0151

* $p < .05$

Both learning outcome type and amount of small group work were shown to have significant and negative relationships to CCS scores, with learning outcome type having the highest level of association ($r = -.191$) accounting for about 4% ($r^2 = .0365$) of the variance in CCS scores among participants. Amount of small group work had a correlation of $r = -.123$ and was responsible for about 2% ($r^2 = .0151$) of the CCS scores variances. The negative direction of the correlation suggests that courses with mainly affective outcomes tended to have higher sense of community scores than courses with cognitive outcomes. The negative relationship between CCS scores and the variable

amount of small group work suggests as the amount of small group work increased the feelings of community decrease.

Course Variables Related to Sense of Community: Occupational Therapy Courses

The relationship between CCS scores and occupational therapy course variables were examined in this aspect of the study. Table 4.33 includes the correlation coefficients and Table 4.34 provides the coefficient of determination data.

Table 4.33. Correlation Matrix for Occupational Therapy Course Variables and CCS Score

	1	2	3	4
1. CCS	1			
2. Learning outcome type	-.278*	1		
3. Subject matter difficulty	.106	-.059	1	
4. Amount of small group work	.200*	-.864*	-.133	1

* $p < .05$

Table 4.34. Correlation Coefficients for Occupational Therapy Course Characteristics

Course Characteristic Variable	r	r^2
Learning outcome type	-.278*	.0772
Subject matter difficulty	.106	.0112
Amount of small group work	.200*	.0400

* $p < .05$

Learning outcome type and subject matter difficulty were both significantly correlated to CCS scores, with learning outcome type demonstrating a negative relationship and subject matter difficulty a positive relationship. The highest correlation was ascribed to learning account type ($r = -.278$) accounting for approximately 7% ($r^2 = .0772$) of the CCS score variance followed by subject matter difficulty ($r = .200$)

accounting for about 4% ($r^2 = .0400$) of the variances in CCS scores for occupational therapy courses. The negative association between CCS scores and learning outcome type signifies that occupational therapy courses with mainly cognitive outcomes tended to have lower community. Subject matter difficulty was positively but not significantly associated with CCS scores.

Phase 1B: Interpretation of Results

Analysis of the zero-order correlations for the entire sample indicated that two variables were significantly related to community, subject matter difficulty and learning outcome type, however the correlations were small. Also, other variables shown to have statistically significant relationships to community for each sub-group examined, campus courses, distance courses, pharmacy courses and occupational therapy courses. But, as with student variables, the relationships between the variables and CCS scores were weak.

The null hypothesis for this study stated, “The course variables within the given set are not related to sense of classroom community.” The null hypotheses is rejected due to the statistically significance relationship between at least one variable and CCS scores. However, the weak nature of the relationships suggests the significance may not practical or meaningful for the study’s audience. As noted in the interpretation of results for Phase 1A of the study, multiple regression analysis was used as an additional measure to address the strength of the relationship between course and student variables and CCS scores.

The variable of learning outcome type was negatively related to community for all subgroups except distance courses. This finding suggests that campus, pharmacy and occupational therapy courses with mainly cognitive outcomes tended to have lower community than those with affective outcomes. An unexpected outcome related to learning outcome type and community was found for distance courses. Correlational data demonstrated that distance courses with cognitive outcomes tended to have higher community. Developing a sense of community within courses with primarily cognitive outcomes may be more difficult as these courses are often more quantitative in nature (math, bench science courses, etc.) and may not lend themselves as well to group work and other instructional strategies that develop community (Lear et al., 2010). However, data for the distance courses in the study suggested otherwise. Some possible explanations will be provided in the Discussion chapter (Chapter 5) of this study.

The learning outcome type variable revealed the highest correlation for each of the study's sub-groups as well as for the entire sample of courses as a whole, indicating that of the three course variables, learning outcome type had the most consistent and predictable relationship with the CCS scores. However, the correlations were small with each being able to account for only 4% - 8% of the variance of the CCS scores. The subset of campus courses was the exception as learning outcome type was able to predict about 21% of the CCS score variance for these courses.

Subject matter difficulty was shown to have a significant correlation to CCS scores for the entire sample as well as for campus courses. A positive relationship was

indicated for both groups, suggesting that the courses containing more difficult subject matter tended to have higher levels of community. As with learning outcome type, the correlations for variable of subject matter difficulty were low, accounting for only about 2% of the CCS score variances.

Examination of the data for the variable amount of small group work illustrated a significant correlation for distance, pharmacy and occupational therapy courses. A negative correlation was identified for both distance courses and pharmacy courses, suggesting that as the amount of small group work increased the feelings of classroom community decreased. However, the opposite was found to be true for occupational therapy courses. It is important to note that the correlations were small ranging from 1.5% to 5.9% with one notable exception; learning outcome type accounted for approximately 20% of the CCS score variance in campus courses. Although the relationship between amount of small group work and CCS scores was weak, the outcomes for distance and pharmacy courses are nevertheless surprising as they contradict existing published research. This finding clearly calls for further investigation. Potential explanations and suggestions for further research will be provided in the discussion of findings in Chapter 5. Table 4.35 provides a summary of significant correlations for campus and student variables.

Table 4.35. Summary of Significant Course and Student Correlations (r) for CCS Scores ($p < .05$)

Course variables	All courses (r)	Campus courses (r)	Distance courses (r)	Pharmacy courses (r)	Occupational Therapy courses (r)
Learning outcome type	.243	.196	-.456	-.191	-.278
Subject matter difficulty	.135		.130		
Amt. small group work		-.189		-.123	.200
Student variables	All students (r)	On-ground students (r)	Online students (r)	Pharmacy students (r)	Occupational Therapy students (r)
Pathway				.284	-.365
Year in program		.286	-.313		
Number of hours employed					
Estimated course grade	.218	.166	.282	.187	.340
Gender			.239		
Age					

Phase 2: Confirm Variables with Strongest Relationship to Sense of Community

This phase of the study sought to answer the question, “What variables within the given set appear to have the strongest relationship to sense of classroom community?” Three sub-questions were used to identify:

1. Variables that have the strongest relationship to sense of community for online students and for on-ground students,
2. Variables with the strongest relationship to community for Doctor of Occupational Therapy students.
3. Variables with the strongest relationship to community for Doctor of Pharmacy students.

Multiple regression analysis was used to identify the relative impact of the group of course characteristics and of the group of student characteristics on the classroom community scale scores. Specifically, the R-Square Change (ΔR^2) statistic was used as it represents the change in the R Squared statistic that is produced by adding or deleting an independent variable (Stockburger, n.d.). If the ΔR^2 associated with a variable is large, that indicates the variable is a good predictor of the dependent variable. Standardized regression coefficients (β) were used to determine the relative impact of each non-binary variable on the CCS score for the group of course variables and for the group of all variables considered together (course and student). Standardized regression coefficients (β) identify the number of standard deviations the dependent variable increases or decreases with a one standard deviation increase in the independent variable (Princeton University, n.d.). In other words, Beta weights determine the relative strength of the predictive relationship between the variables (course and student characteristics) shown to have a significant predicative relationship to the dependent variable (CCS scores). Interpretation of outcomes for dichotomous variables (outcome type, pathway, and gender) is slightly different since it does not make sense to talk about an increase or

decrease in a variable with only two possible values. Interpretation of the outcomes for dichotomous variables included the direction of the relationship (positive or negative) and a comparison of the dependent variable value (CCS scores) for one value of the independent variable versus the other.

Two models were employed in each of the multiple regression analyses. Model 1 examined the relative contribution of individual course variables (amount of small group work, outcome type, subject matter difficulty) and Model 2 included the addition of student variables (pathway, year in program, average hours employed, estimated course grade, gender, and age) to the set of course variables.

Testing Assumptions

The multiple regression assumptions tested include (1) the regression is linear, (2) the error variance is constant, (3) the residuals are normally distributed, (4) the predictor variables are not collinear, (5) no outlying data points were included in the analysis, (6) the errors are independent of each other. Assumption testing was conducted for the entire sample as well as for each sub-group (on-ground students, online students, pharmacy students, and occupational therapy students). The methods used to test each assumption are summarized.

(1) Testing for the presence of a linear relationship between dependent and independent variables was conducted by examining the scatter plots of the observed and expected standardized residuals (Appendix I). The scatter plots illustrated the data points were symmetrically distributed along a diagonal line

running from the lower left-hand corner to the upper right-hand corner of the diagram indicating the presence of a linear relationship.

(2) Consistency of the error variance assumption was tested by analyzing the multiple regression scatter plots (Appendix J). If the error was not constant the plots would have a megaphone shape indicating as the correlations increased the amount of error would also increase.

(3) Histograms (Appendix K) of the standardized residuals were used to test the assumption of normal distribution of the residuals. Residuals are the difference between the predicted outcome based on the regression equation and the actual outcomes. The histograms illustrate the residuals were normally distributed indicating that the regression equations can be expected to accurately predict the actual outcomes.

(4) Pearson Correlations, Tolerance and VIF scores from the Coefficients table (Appendix L) were used to test for the presence of multicollinearity.

Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated (Wikipedia, 2012).

Pearson correlations demonstrated no correlations reached the .80 threshold, therefore the analysis showed that no two variables are closely related. Tolerance scores of less than .1 indicate multicollinearity exists. The tolerance scores for the entire sample as well as each sub-group were greater than .1 indicating that the predictor variables were not collinear. Additionally, the VIF scores also support the assumption of non-collinearity. VIF scores of greater than 10 indicate

the presence of multicollinearity. Study results indicated there is no reason for concern that the predictive variables excessively influenced each other.

(5) The presence of outlying data points was tested by examining Cooks Distance Residual statistic from the Residual Statistic tables for each of the study's groups (Appendix M). A maximum statistical value greater than .936 indicates the presence of outlying data values. The Cooks scores for this study were well below the .936 threshold indicating outlying data points were not included in the regression analysis.

(6) The assumption of error independence was tested by examining the multiple regression scatter plot diagrams (Appendix J). The shape of the scatter plots, nonlinear and of no particular shape, demonstrated the errors were independent of one another. If the errors were related the scatter plot would resemble a straight line illustrating that as the predicted values increased the error value also increased.

Strength of Relationship: Entire Sample

Hierarchical regression was performed to determine which set of predictors (i.e., course or student) accounted for more variance in CCS scores. Multiple regression analysis revealed that course variables accounted for 6.3% ($\Delta R^2 = .063$) of the variance in CCS scores and the addition of student characteristics in the regression equation accounted for an additional 9.5% ($\Delta R^2 = .095$). These results indicate that, for the entire sample, neither course variables nor all variables considered together are able to predict a

large percentage of the variances in students' feelings of classroom community. Table 4.36 includes the data from the multiple regression analysis of all course characteristics and all student characteristics.

Table 4.36 Multiple Regression Analysis: Course and Student Variables for the Entire Sample

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1 ^a	.250	.063	.052	.58192	.063	6.137	3	367	.000
2 ^b	.397	.158	.134	.55620	.095	6.789	6	361	.000

a. subject matter difficulty, outcome type, amount of small group work

b. subject matter difficulty, outcome type, amount of small group work, average hours employed per week, age, gender, estimated grade, year in program, pathway (campus or distance)

Course variables: Entire sample. Investigation of the relationship between each course variable and the dependent variable (CCS scores) using multiple regression analysis (Table 4.37, Model 1) resulted in statistically significant findings for one of the three course variables. Outcome type (affective or cognitive) was the only course variable shown to significantly predict the CCS score ($\beta = -.226$, $t = -4.463$, $p < .001$). Neither small group work nor subject matter difficulty was shown to significantly contribute to the ability to predict the CCS scores.

Table 4.37. Multiple Regression Coefficients: Course and Student Variables for the Entire Sample

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1 ^a	(Constant)	3.838	.165		23.331	.000
	Small group	.067	.034	.108	1.943	.053
	Outcome type	-.279	.062	-.226	-4.463	.000
	Subject matter difficulty	-.016	.053	-.017	-.302	.763
2 ^b	(Constant)	3.094	.379		8.154	.000
	Small group	.127	.035	.205	3.671	.000
	Outcome type	-.364	.077	-.295	-4.697	.000
	Subject matter difficulty	-.038	.052	-.040	-.725	.469
	Pathway	.323	.080	.260	4.018	.000
	Year in the program	-.141	.047	-.191	-3.010	.003
	Average hours employed	-.003	.003	-.042	-.819	.413
	Estimated grade	.204	.051	.217	3.975	.000
	Gender	.116	.066	.089	1.766	.078
	Age	-.014	.006	-.147	-2.271	.024

a. subject matter difficulty, outcome type, amount of small group work

b. subject matter difficulty, outcome type, amount of small group work, average hours employed per week, age, gender, estimated grade, year in program, pathway (campus or distance)

All variables: Entire sample. The analysis conducted for Model 2 containing all variables (course and student variables) illustrated a total of six variables significantly contributed to the prediction of CCS scores. A summary of these findings, rank ordered by relative strength of the predictive relationship to CCS scores follows.

(1) Outcome Type ($\beta = -.226$, $t = -4.697$, $p < .001$). Findings indicated that there was a negative relationship between outcome type and community, suggesting that courses with mainly cognitive outcomes tended to have lower community than those with affective outcomes. Specifically, CCS scores for courses with cognitive outcomes tended

to be .226 standard deviations lower than in courses with affective outcomes, holding all other variables constant.

(2) Pathway of enrollment ($\beta = .260, t = 4.018, p < .001$). These outcomes indicated that higher levels of community tended to occur in distance courses than in campus courses. CCS scores for distance courses were .260 standard deviations higher in distance courses than in campus courses, controlling for all other variables. This is a surprising outcome given the prevalence in the literature of reported feelings of isolation and disconnectedness among distance students.

(3) Estimated Course Grade ($\beta = .217, t = 3.975, p < .001$). The beta weight indicated that for a one standard deviation increase in estimated course grade a .217 standard deviation increase can be expected in CCS scores. This is an expected outcome as one would expect better performing students to feel more connected and a greater sense of belongingness.

(4) Amount of Small Group Work ($\beta = .205, t = 3.671, p < .001$). The relative impact coefficient (β) for the amount of small group work variable suggested that for a one standard deviation increase in the amount of small group work value, there was a .205 standard deviation increase in Classroom Community Scale scores. Intuitively, as more group work is used in courses, students have an opportunity to form relationships and therefore feel more connected and part of a larger community.

(5) Year in Program ($\beta = -.191, t = -3.010, p = .003$). The beta weight indicated that for a one standard deviation increase in year in program value the CCS score can be expected to decrease by .191 standard deviations. In other words, as students progress

through their program of study, one can expect the level of community to decrease. The finding seems counterintuitive. A reasonable expectation would be that as students matriculate through the program, particularly a cohort-based program, they would bond with other students and their feelings of being part of a community would increase.

(6) Age ($\beta = -.147$, $t = 2.271$, $p = .024$). The outcome for age showed that each one standard deviation increase in age corresponded to a decrease in CCS scores of .147 standard deviations.

Neither subject matter difficulty, average hours employed, nor gender was found to be a significant predictor of CCS scores.

Strength of Relationship: On-ground Student Results

The set of predictors (course or student) accounting for the most variance in CCS scores for on-ground students ($n = 250$) was determined through the use of hierarchical regression. This analysis indicated that 26.8% of the variance in CCS scores was accounted for by course characteristic variables (subject matter difficulty, outcome type, amount of small group work). The addition of student variables (average hours employed per week, age, gender, estimated grade, year in program, pathway) resulted in ΔR^2 equal to .024 ($\Delta F = 1.523$, $p = .183$, $df = 5, 227$) suggesting that student variables accounted for an additional 2.4% of the variance; however, student variables did not significantly contribute to the explanation of CCS score variance. Table 4.38 includes the data from the multiple regression analysis of course characteristics and student characteristics for on-ground students.

Table 4.38. Multiple Regression Analysis: On-ground Course and Student Variables
($n = 250$)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1 ^a	.517	.268	.255	.50944	.268	21.184	3	232	.000
2 ^b	.540	.291	.263	.50659	.024	1.523	5	227	.183

a. Subject matter difficulty, outcome type, amount of small group work

b. Subject matter difficulty, outcome type, amount of small group work, average hours employed per week, age, gender, estimated grade, year in program

Course variables: On-ground students. Analysis of the Standardized

Coefficient (β) (Table 4.39) for Model 1 (course variables) resulted in statistically significant findings for two of the three course variables, amount of small group work ($\beta = .182$, $t = 2.908$, $p = .004$) and outcome type. ($\beta = -.444$, $t = -7.840$, $p = <.001$) with outcome type shown to have the strongest predictive relationship to CCS scores. These outcomes signify that for every one standard deviation increase in the amount of small group work used in an on-ground course there was a corresponding increase of .182 standard deviations for CCS scores (students' feelings of community). Additionally, courses with cognitive outcomes corresponded with decreased feelings of community among on-ground students. Findings indicate that there was negative relationship between outcome type and community, suggesting that courses with mainly cognitive outcomes tended to have lower community than those with affective outcomes. Specifically, CCS scores for courses with cognitive outcomes tended to be .444 standard deviations lower than in courses with affective outcomes, holding all other variables constant. Subject matter difficulty was not shown to significantly contribute to the ability to predict the variance of CCS scores.

Table 4.39. Multiple Regression Coefficients: On-ground Course and Student Variables
($n = 250$)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1 ^a	(Constant)	3.925	.187		21.022	.000
	Small group work	.105	.036	.182	2.908	.004
	Outcome type	-.550	.070	-.444	-7.840	.000
	Subject matter difficulty	.071	.060	.074	1.190	.235
2 ^b	(Constant)	3.706	.450		8.236	.000
	Small group work	.123	.039	.214	3.147	.002
	Outcome type	-.559	.082	-.451	-6.791	.000
	Subject matter difficulty	.064	.062	.066	1.029	.305
	Year in program	-.055	.052	-.073	-1.049	.295
	Hours employed	-.005	.005	-.065	-1.133	.258
	Estimated grade	.114	.057	.128	2.009	.046
	Gender	.009	.078	.007	.112	.911
	Age	-.006	.010	-.037	-.612	.541

a. subject matter difficulty, outcome type, amount of small group work

b. subject matter difficulty, outcome type, amount of small group work, average hours employed per week, age, gender, estimated grade, year in program, pathway (campus or distance)

All variables: On-ground students. The R^2 statistic notes that course and student variables accounted for 29.1% of CCS score variance. Further analysis of these variables (Model 2, Table 4.39) illustrated that two of the three course variables and one of five student variables significantly contributed to the predictability of CCS score variance. Significant predictor variables included (in order of strength of statistical significance) (1) outcome type ($\beta = -.451$, $t = -6.791$, $p < .001$), (2) amount of small group

work ($\beta = .214$, $t = 3.147$, $p = .002$), and (3) estimated grade ($\beta = .128$, $t = 2.009$, $p = .046$). These results suggest the following:

- CCS scores for courses with cognitive outcomes tended to be .451 standard deviations lower than in courses with affective outcomes, holding all other variables constant.
- For every one standard deviation increase in amount of small group work there was a corresponding increase of .214 standard deviations in the CCS score.
- For every one standard deviation increase in estimated grade value there was a corresponding increase of .128 standard deviation in the CCS score.

Both year in the program ($r = .286$) and subject matter difficulty ($r = .130$) were shown by correlational analysis to have a significant relationship to community, but neither were shown to significantly contribute to the prediction of CCS score variance. Additionally, average number of hours employed, gender and age were not shown to significantly add to the ability to predict CCS scores.

Strength of Relationship: Online Student Results

Results from the hierarchical regression analysis of online student ($n = 136$) found both course characteristics and student characteristics significantly contribute to the ability to predict CCS score variances. Analysis of course variables (subject matter difficulty, outcome type, amount of small group work) indicated they account for 7.9% ($\Delta R^2 = .079$, $\Delta F = 3.730$, $p = .013$, $df = 3$, 130) of the variance in CCS scores. The addition of student variables ($\Delta R^2 = .174$) accounted for an added 17.4% of the variance

($\Delta F = 5.828$, $p = .000$, $df = 5, 125$). Table 4.40 includes the data from the multiple regression analysis of course characteristics and student characteristics for online students.

Table 4.40 Multiple Regression Analysis: Online Course and Student Variables ($n = 136$)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1 ^a	.282	.079	.058	.58002	.079	3.730	3	130	.013
2 ^b	.503	.253	.206	.53267	.174	5.828	5	125	.000

a. Subject matter difficulty, outcome type, amount of small group work

b. Subject matter difficulty, outcome type, amount of small group work, average hours employed per week, age, gender, estimated grade, year in program

Course variables: Online students. Course variables (amount of small group work, outcome type, and subject matter difficulty) for online students were analyzed using the Standardized Coefficient (β). Results revealed statistically significant findings for one of the three course variables, outcome type ($\beta = .213$, $t = 2.505$, $p = .013$). These outcomes signify a positive relationship between outcome type and community, suggesting that among online students, courses with mainly cognitive outcomes tended to have higher community than those with affective outcomes. Specifically, CCS scores for courses with cognitive outcomes tended to be .213 standard deviations higher than in courses with affective outcomes, holding all other variables constant. Neither amount of small group work nor subject matter difficulty was shown to significantly contribute to

the ability to predict the variance of CCS score variance. These results of the regression analysis are represented in Table 4.41.

Table 4.41. Multiple Regression Coefficients: Online Course and Student Variables
($n = 136$)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1 ^a	(Constant)	3.595	.265		13.587	.000
	Small group	-.093	.069	-.124	-1.349	.180
	Outcome type	.257	.102	.213	2.505	.013
	Subject matter difficulty	-.113	.088	-.118	-1.290	.199
2 ^b	(Constant)	3.777	.740		5.102	.000
	Small group	-.080	.066	-.107	-1.222	.224
	Outcome type	-.124	.158	-.103	-.784	.434
	Subject matter difficulty	-.124	.082	-.129	-1.518	.132
	Year in program	-.287	.095	-.396	-3.026	.003
	Hours employed	-.006	.004	-.118	-1.404	.163
	Estimated grade	.281	.090	.263	3.125	.002
	Gender	.281	.106	.221	2.636	.009
	Age	-.017	.007	-.187	-2.315	.022

a. Subject matter difficulty, outcome type, amount of small group work

b. Subject matter difficulty, outcome type, amount of small group work, average hours employed per week, age, gender, estimated grade, year in program

All variables: Online students. The previously noted analysis of course and student variables predicted 25.3% of CCS score variance. Further analysis revealed that when analyzing only course variables, the variable outcome type was the only variable that significantly contributed to the prediction of CCS score variability. However, when all variables are considered, course and student variables (Model 2, Table 4.41), none of

the three course variables were shown to contribute significantly to the prediction of CCS score variance, but four of five student variables were shown to significantly contribute.

Significant predictor variables included (in order of strength of statistical significance)

(1) year in the program ($\beta = -.396$, $t = -3.026$, $p = .003$), (2) estimated grade ($\beta = .263$, $t = 3.125$, $p = .002$), gender ($\beta = .221$, $t = 2.636$, $p = .009$), and (4) age ($\beta = -.187$, $t = -2.315$, $p = .022$). These results suggest the following:

- For every one standard deviation increase in year of program there was a corresponding decrease of .396 standard deviations in CCS scores; as on-ground students progress through their program of study, their feelings of community decrease.
- For every one standard deviation increase in estimated course grade there was a corresponding increase of .263 standard deviation increase in CCS scores.
- Among on-ground students, males tended to have higher levels of association with feeling of community than females. Specifically, CCS scores for males tended to be .221 standard deviations higher than for females, holding all other variables constant.
- For every one standard deviation increase in age there was a corresponding decrease of .187 standard deviations in CCS scores; among online students, older students tended to have lower sense of community.

Correlation analysis results suggested small group work ($r = -.189$) and outcome type ($r = .196$) had significant associations with community, but neither were shown to contribute to the prediction of CCS score variance in a significant manner. Furthermore,

neither subject matter difficulty nor average number of hours employed were shown to significantly add to the ability to predict CCS scores.

Strength of Relationship: Doctor of Pharmacy Student Results

Hierarchical regression was performed to determine which set of predictors (course or student) accounted for more variance in CCS scores for pharmacy students ($n = 285$). Multiple regression revealed that course variables (subject matter difficulty, outcome type, amount of small group work) accounted for 10.1% ($\Delta R^2 = .101$, $\Delta F = 7.528$, $p < .001$, $df = 3, 269$) of the variance in CCS scores. The addition of student variables ($\Delta R^2 = .098$) accounted for an additional 9.8% of the variance in CCS scores for online students ($\Delta F = 6.454$, $p < .001$, $df = 5, 264$). Table 4.42 includes the data from the multiple regression analysis of course characteristics and student characteristics for pharmacy students.

Table 4.42 Multiple Regression Analysis: Pharmacy Course and Student Variables ($n = 285$)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1 ^a	.317	.101	.087	.57608	.101	7.528	3	269	<.001
2 ^b	.446	.199	.171	.54893	.098	6.454	5	264	.000

a. Subject matter difficulty, outcome type, amount of small group work

b. Subject matter difficulty, outcome type, amount of small group work, pathway (campus or distance), average hours employed per week, age, gender, estimated grade

Course variables: Pharmacy students. Multiple regression analysis of course variables for pharmacy students (Table 4.43, Model 1) revealed statistically significant results for two of the three course variables, amount of small group work ($\beta = .301$, $t = 4.371$, $p < .001$) and outcome type ($\beta = -.320$, $t = -4.862$, $p < .001$). The Beta coefficient connoted that for every one standard deviation increase in small group work there was a corresponding decrease of .301 standard deviations in CCS scores. Furthermore, pharmacy courses with mainly cognitive outcomes tended to have lower community than those with affective outcomes. Specifically, CCS scores for courses with cognitive outcomes tended to be .320 standard deviations lower than in courses with affective outcomes, holding all other variables constant. Subject matter difficulty was not shown to significantly contribute to the ability to predict standard deviation values for pharmacy student CCS scores.

Table 4.43. Multiple Regression Coefficients: Pharmacy Course and Student Variables
($n = 285$)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1 ^a	(Constant)	3.837	.187		20.509	.000
	Small group work	.374	.085	.301	4.371	.000
	Outcome type	-.433	.089	-.320	-4.862	.000
	Subject matter difficulty	-.069	.062	-.068	-1.112	.267
2 ^b	(Constant)	2.769	.417		6.638	.000
	Small group work	.377	.082	.304	4.572	.000
	Outcome type	-.308	.092	-.227	-3.328	.001
	Subject matter difficulty	-.090	.060	-.089	-1.506	.133
	Pathway	.440	.091	.362	4.855	.000
	Average hours employed	-.005	.004	-.077	-1.310	.191
	Estimated grade	.115	.060	.124	1.896	.059
	Gender	.108	.072	.086	1.499	.135
	Age	-.012	.007	-.133	-1.767	.078

a. Subject matter difficulty, outcome type, amount of small group work

b. Subject matter difficulty, outcome type, amount of small group work, pathway (campus or distance), average hours employed per week, age, gender, estimated grade

All variables: Pharmacy students. Model 2 (Table 4.43) of the regression analysis indicates that, when all variables are considered together, three variables were found to significantly contribute to the 19.9% ($r^2 = .199$) variance in CCS scores. These variables included small group work ($\beta = .304$, $t = 4.572$, $p < .001$), outcome type ($\beta = -.227$, $t = -3.328$, $p < .001$) and pathway ($\beta = .362$, $t = 4.855$, $p < .001$). Pathway showed the strongest relationship to CCS score variance, followed by small group work and outcome type. The Beta weight for small group work variable suggested that for every one standard deviation increase in small group work values there was a corresponding

increase of .304 standard deviations in CCS scores; pointing out that as the amount of small group work used in a course increased feelings of classroom community among students also increased. Outcome type results indicated that pharmacy courses with mainly cognitive outcomes tended to have lower community than those with affective outcomes. Specifically, CCS scores for courses with cognitive outcomes tended to be .227 standard deviations lower than in courses with affective outcomes, holding all other variables constant. The outcome for pathway indicated that distance students tended to report higher levels of community. CCS scores for pharmacy students in the distance pathway were .362 standard deviations higher than for students in the campus pathway. The variable year in the program was shown to be very highly correlated with the variable age for pharmacy students and was therefore excluded from the model during data analysis. Although correlational analysis indicated the variable of estimated course grade ($r = .187$) was significantly related to CCS scores, it was not found to significantly predict CCS scores. Additionally, subject matter difficulty, average hours employed per week, age, and gender were not shown to be predictive of community for pharmacy students.

Strength of Relationship: Doctor of Occupational Therapy Student Results

Hierarchical regression analysis results for occupational therapy student data ($n = 101$) found both course characteristics and student characteristics significantly contributed to the ability to predict CCS score variances. Analysis of course variables (subject matter difficulty, outcome type, amount of small group work) indicated they

account for 8.8% ($\Delta R^2 = .087$) of the variance in CCS scores. The addition of student variables ($\Delta R^2 = .191$) accounted for an additional 19.1% of the variance in CCS scores for online students ($\Delta F = 4.648, p < .001, df = 5, 88$). Table 4.44 includes the data from the multiple regression analysis of course characteristics and student characteristics for occupational therapy students.

Table 4.44 Multiple Regression Analysis: Occupational Therapy Course and Student Variables for ($n = 101$)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1 ^a	.295	.087	.058	.56290	.087	2.957	3	93	.036
2 ^b	.527	.278	.212	.51468	.191	4.648	5	88	.001

a. Subject matter difficulty, outcome type, amount of small group work

b. Subject matter difficulty, outcome type, amount of small group work, pathway (campus or distance), average hours employed per week, age, gender, estimated grade

Course variables: Occupational therapy students. Occupational therapy student course variables (Table 4.45, Model 1) were analyzed using the Standardized Coefficient (Beta). Statistically significant results for one of the three course variables, outcome type ($\beta = -.277, t = -2.740, p = .007$), were noted. Findings indicate that occupational therapy courses with mainly cognitive outcomes tended to have lower community than those with affective outcomes. Specifically, CCS scores for courses with cognitive outcomes tended to be .277 standard deviations lower than for those with affective outcomes. Neither amount of small group work nor subject matter difficulty was shown to significantly contribute to the ability to predict standard deviation values for CCS scores.

Table 4.45. Multiple Regression Coefficients: Occupational Therapy Course and Student Variables ($n = 101$)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1 ^a	(Constant)	3.712	.338		10.997	.000
	Small group	.016	.050	.035	.324	.747
	Outcome type	-.339	.124	-.277	-2.740	.007
	Subject matter difficulty	.082	.106	.084	.780	.437
2 ^b	(Constant)	2.636	.650		4.056	.000
	Small group	.044	.047	.095	.935	.353
	Outcome type	-.310	.117	-.253	-2.642	.010
	Subject matter difficulty	.128	.101	.130	1.269	.208
	Pathway	-.229	.191	-.147	-1.200	.233
	Average hours employed	-.001	.006	-.010	-.101	.920
	Estimated grade	.332	.101	.328	3.278	.001
	Gender	.119	.156	.073	.762	.448
	Age	-.019	.014	-.174	-1.417	.160

a. Subject matter difficulty, outcome type, amount of small group work

b. Subject matter difficulty, outcome type, amount of small group work, pathway (campus or distance), average hours employed per week, age, gender, estimated grade

All variables: Occupational therapy students. Of the 27.8% variance in CCS scores that was predicted by the course and student variables, further analysis in which all variables were considered found just two variables significantly contributed to the prediction of CCS variance, outcome type ($\beta = -.253$, $t = -2.642$, $p = .010$), and estimated grade ($\beta = .328$, $t = 3.2786$, $p < .001$) with estimated course grade having a slightly stronger predictive relationship to CCS scores than outcome type. These results suggest there is a negative relationship between outcome type and community, indicating that students in occupational therapy courses with mainly cognitive outcomes tended to have

lower community than those with affective outcomes. Specifically, CCS scores for courses with cognitive outcomes tended to be .253 standard deviations lower than courses with affective outcomes. Estimated course grade results implied that for every one standard deviation increase in estimated course grade there was a corresponding increase of .328 standard deviations in CCS scores. Although correlational analysis demonstrated amount of small group work ($r = .200$) and pathway (campus or distance) ($r = -.365$) were shown to be significantly associated to CCS scores, neither were found to significantly predict CCS scores. Moreover, subject matter difficulty, average hours employed per week, age, and gender were not shown to be predictive of community among occupational therapy students.

Phase 2: Interpretation of Results

Hierarchical regression analyses were performed to identify the variables within the given set that appeared to have strongest relationship to sense of classroom community for the entire sample as well as for each sub-group. Results of the analyses indicate the set of variables with the strongest association to community was different for each group included in the study (all groups considered together, on-ground students, online students, pharmacy students and occupational therapy students). A summary of the findings for each group is provided.

When all groups included in the study were considered together, course and student variables accounted for 15.8 % of the CCS score variance. The six variables that accounted for most of this prediction were (in rank order) outcome type,

pathway, estimated course grade, amount of small group work, year in the program, and age.

Outcomes for on-ground students revealed course and student variables accounted for 29.1% of the variance in CCS scores. Of these variables, outcome type, amount of small group work, and estimated grade accounted for most of the predicted variance.

Online student findings suggested that student variables explained 25.5% of the CCS score variance. When considering all variables together, no course variables were shown to contribute to the prediction of variance in CCS scores. The majority of the prediction was explained by the variables year in the program, estimated grade, gender, and age. Comparing results for on-ground and online students illustrated that estimated grade is the only variable shown to significantly contribute to the prediction of CCS score variability for both groups of students.

Results for pharmacy students pointed out that 19.9% of the variable in CCS scores could be predicted by student and course variables. Specifically, the variables of pathway, amount of small group work, and outcome type comprised the prediction.

Course and student variables were shown to predict 27.8% of the CCS scores variance for occupational therapy students. Most of the prediction was explained by two variables, outcome type and estimated grade.

No single variable was shown to contribute to the prediction of CCS scores for every group; however both outcome type and estimated course grade significantly contributed to the ability to predict variance for four groups. Outcome type contributed to the prediction of variance for on-ground, pharmacy, and occupational therapy students as well as for the entire sample when considered together. Estimated course grade was identified as a significant predictor for on-ground, online, and occupational therapy students as well as for the entire sample.

Summary

This chapter has presented the results of data analyses in order to seek answers for each of the research questions. Correlational analysis was conducted using the Statistical Package for Social Sciences (SPSSTM) data analysis software in order to identify course variables and student variables with statistically significant relationships to community. Data were displayed in two sets of correlation matrices, one set for student variables and one for course variables. Each set consisted of five matrices, one matrix for each sub-group (1) online students, (2) on-ground students, (3) doctor of occupational therapy students, and (4) doctor of pharmacy students and one for the entire study sample. Statistically significant correlations were found for each study group; however a different set of significant variables were identified for each sub-group.

Multiple regression analysis was then conducted to determine the relative impact of course and student characteristics on overall sense of classroom community. The relative indication of the significance of each variable was determined by standardized

regression coefficients. Scatter diagrams of residuals and normal probability plots of residuals as well as histograms of the regression standardized residuals were constructed to test assumptions. Results of the regression analysis demonstrated a set of predictor variables for each sub-group as well as the overall sample. The composition of the set of predictor variables was different for each group.

CHAPTER 5: DISCUSSION

Introduction

The primary purpose of this study was to explore the theoretical framework of classroom community. The study was underpinned by Rovai's (2002a) Classroom Community framework. Rovai suggests several factors influence the degree to which students feel a sense of community, including transactional distance, social presence, social equality, small group activities, group facilitation, teaching style and learning stage, and community size. However, the literature also points out gaps in the exploration of community among learners (Bentz, 2010; Conrad, 2005; Liu et al., 2007; Rovai, 2001, 2002a; Shea, 2006; Tsai et al., 2008). These gaps include exploration of discipline specific factors influencing formation of community, lack of comparison of online and on-ground community, and conflicting information regarding the influence of gender, age, employment status on sense of community. This study was designed to address some of these gaps. Specifically, the study was developed to explore student characteristic variables and course characteristic variables associated with sense of community.

Discussion of the findings from this study is presented in three sub-sections, one addressing the examination of outcomes for online and on-ground students, the second discussing the study outcomes as they relate to pharmacy students and the third reports the outcomes to occupational therapy students. It is important to note this study was not designed to compare the outcomes of the Pharmacy and Occupational Therapy students,

but to gather information for each program. Therefore, the findings for these two programs are discussed separately. Following the discussion of the findings are recommendations for further research as well as recommendations for practice. Table 5.1 identifies the combination of variables found to contribute to the ability to predict CCS scores for each sub-group when all variables are considered together.

Table 5.1. Combinations of Variables Found to be Significant Predictors of CCS Score Variance for Each Sub-Group - All Variables Considered Together ($p < .05$)

Variables	Entire Sample (β)	On-ground students (β)	Online students (β)	Pharmacy students (β)	Occupational Therapy students (β)
Learning outcome type	-.295	-.451		-.227	-.253
Subject matter difficulty					
Amt. small group work	.205	.213		.304	
Pathway	.260			.362	
Year in program	.191		-.396		
Number of hours employed					
Estimated course grade	.217	.128	.263	.124**	.328
Gender			.221		
Age	.147		-.187		

** $p < .059$

The research design and subsequent outcomes of this study built on the work of Rovai (2002a, 2002b, 2002c) as he was among the first researchers to examine feelings of community among online learners and create a framework used to investigate this topic.

Online and On-ground Student Outcomes

This section discusses the statistically significant outcomes of the study analyses related to online and on-ground students for all study variables. Figure 5.1 summarizes the outcomes from the multiple regression analyses of course and student variables for online and on-ground students and serves as a framework for organizing the discussion of outcomes.

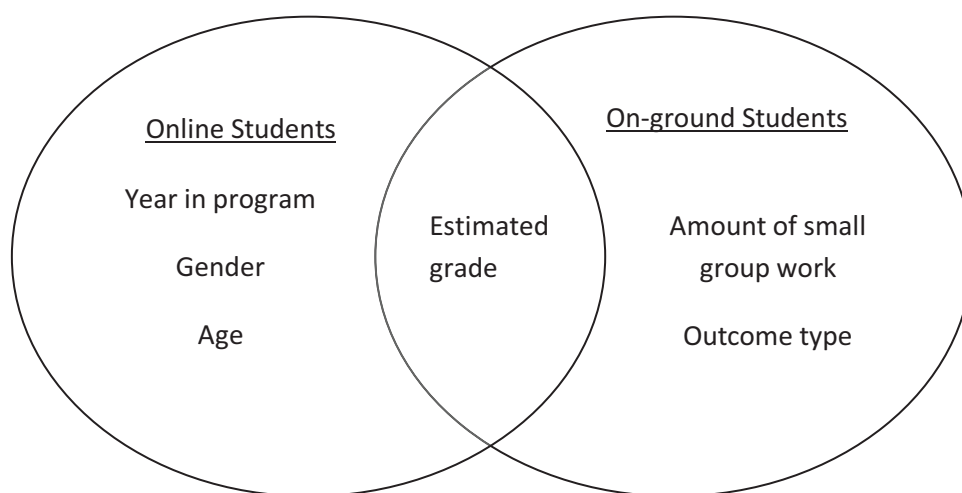


Figure 5.1. Student and course variables determined to be predictive of CCS score variance for online and on-ground students.

Multiple regression analysis determined that a moderate amount, 29.1%, of the variance in CCS scores for on-ground students could be explained by the set of course and student variables. Most of the variance (26.8%) was explained by the set of course variables. For online students, the set of course and student variables also accounted for a moderate amount, 25.3%, of the CCS score variance. However, for online students most

of the explanation, 17.4%, was accounted for by the set of all variables considered together. Given that the sets of course and student variables were able to explain approximately 25% to 30% of the CCS score variances, these sets of variables should be considered by researchers investigating classroom community as well as by practitioners seeking to enhance classroom community.

Estimated course grade was a significant predictor of community for both online and on-ground students, a finding aligned with the significant and positive relationship between estimated grade and CCS scores found in the correlational analysis. This outcome is supported by the published literature. Benbunan-Fich and Hiltz (2003), Rovai (2001), and Sadera et al. (2009) suggest that students with a higher sense of community perceive they are learning at a higher level than students with lower feelings of community.

Additional predictors of community for on-ground students included amount of small group work and outcome type. Amount of small group work was shown to be positively related to community (increases in the amount of small group work correspond to increased feeling of classroom community), a finding supported by existing research. Brown's (1994) work as well as that by Blumenfeld, Marx, Soloway, and Krajcik (1996) demonstrated the use of small groups in classrooms led to the development of communities of learners among students.

The negative relationship between outcome type and community for on-ground students suggests campus courses with mainly affective outcomes (Ethics in the Health Care Professions, Introduction to Health Care Ethics, Critical Analysis of Occupational

Therapy Practice) are connected to higher sense of community. This finding may be explained by research on the association of academic discipline and teaching practices. Scholars in this area suggest that instructors in the “hard sciences” such as the physical sciences, engineering and medicine, tend to employ teacher-centered teaching practices while those in the “soft disciplines,” such as social sciences and humanities, are prone to using more learner-centered approaches (Lueddeke, 2003; Trigwell, 2002). The three courses included in the study that were identified as having mainly affective outcomes could be classified as “soft disciplines.” Therefore, based on the research cited, it is likely instructors in these courses employed more learner-centric instructional approaches, which could account for the increased feeling of community reported by the students. However, extrapolation of this outcome to other contexts may be limited given the number of courses included in the study. Furthermore, scholars in the area of teaching and learning note the lack of research investigating the relationship between disciplines and teaching approaches and call for additional investigation in this aspect of education (Lindblom-Ylänne, Trigwell, Nevgia & Ashwin, 2006).

The lack of evidence from this study that the variables amount of small group work and outcome type are also predictors of community for online students was an unexpected outcome. The scholarly literature and published books abound with evidence supporting the relationship between use of small group work and development of community among online students (Ko & Rossen, 2010; Palloff & Pratt, 2007; Simonson, Smaldino, Albright, & Zvacek, 2009). Additionally, similar to the findings for on-ground courses, research suggests a relationship exists between academic discipline and teaching

practices in online courses (Arbaugh, Bangert, & Cleveland-Innes, 2010). One potential reason for the different findings for on-ground and online students may be the level of instructor experience teaching online. Some scholars (Arbaugh, 2005; Drago, Peltier, & Sorensen, 2002) have suggested that instructor experience and skill for effective online teaching has a larger effect on students than the subject matter being taught. Clearly additional research is needed to determine the basis for these outcomes.

Variables identified as predictors of community for online students, in addition to the previously mentioned estimated course grade, include year in the program (negative association), gender (positive association), and age (negative association). The negative relationship between year in the program and community, indicating that online students' feeling of community decreased as they progressed in their program was not expected. As noted in the reporting of the findings, one can reasonably expect students' sense of community to develop as they matriculate through a program of study, particularly with the same cohort of students. This unanticipated outcome may potentially be explained by an increase in online students' comfort level with being an online learner as they progress from year-to-year in their program; as a result they may feel they are able to work more autonomously. Furthermore, this outcome may be related to the courses in which the online students were enrolled and the instructors' teaching skills. A total of six courses were included in the study and the instructors' skill for teaching online students is unknown. By chance, the study could have included several courses with instructors not well skilled in teaching online.

The association of gender as a predictor of community for online students suggests that males reported higher levels of community than females, a finding that is not supported by existing research. The role of gender and community among online students was discussed by Abedin et al. (2010) and Rovai (2002b), noting males are more likely to employ an assertive and impersonal communication style and value competition, while the majority of females use a connected voice and value cooperation. Conversely, Shea (2006) did not find gender to be a significant contributing factor to online students' sense of community. A possible explanation for this outcome may be that males selecting either pharmacy or occupational therapy as a profession are predisposed to a more relational communication style, as the professions require effective interaction with patients. Also, only one-third of the participants in the study were male, therefore it is possible that the male participants are not representative of the total male study population.

Age as a predictive variable indicated that, among online students, older students reported lower levels of community. Several explanations may exist for this outcome. Older students may have more demands on their time related to family and community. Therefore, they may put forth less effort to be connected and develop a sense of belongingness within the context of their educational experiences; they may focus more on community development outside of their courses. Moreover, older students may be less facile or interested in building community using technology as the mediator. A negative relationship between age and technology use is supported by Charness and Boot (2009) who investigated attitudes and abilities as predictors of technology use. A third

explanation for this outcome may be found in the relationship between age and year in the program for pharmacy and occupational therapy students. These two variables were found to be very highly correlated for pharmacy and occupational therapy students; in fact the correlation was so high that the variable year in the program was excluded in the data analysis. One wonders if the online students' outcomes for age are not also associated with year in the program.

In summary, the only predictive variable common to both online and on-ground students was estimated course grade. The absence of a common set of predictive variables for community for both online and on-ground courses was surprising. Although the contextual differences between online and on-ground teaching environments and differences in student variables has been noted in the literature (Lehman & Conceição, 2010; McCarthy & Samors, 2009; Rovai, 2002a), one would expect variables such as small group work and year in the program to play a significant role in forecasting the presence of community regardless of educational context or student demographics. Additional research is needed with a larger sample size, random sampling technique and inclusion of a larger number of courses to either verify or refute the outcomes of this study.

Pharmacy Student Outcomes

The set of course and student variables were able to explain a small to moderate amount of the variance in pharmacy student CCS scores, almost 20%. As with the findings for on-ground and online students, the data for pharmacy students suggests that

the set of course and student variables should be considered by those interested in classroom community, both researches and educators. Three variables, two course variables and one student variable, were found to contribute in a significant manner to the prediction of CCS score variance, outcome type (negative association), amount of small group work (positive association), and pathway (positive association).

The negative relationship of outcome type to CCS scores for pharmacy students denotes an inverse relationship between cognitive outcomes and community; courses which mainly employ cognitive outcomes tend to have lower community than those with affective outcomes. A discussion of a similar finding for on-ground students is included in the section titled Online and On-ground Student Outcomes so it will not be repeated here.

Among pharmacy students the use of small group work was shown to lead to increased feeling of community. As noted in the discussion of outcomes for on-ground students, this result is congruent with published research which posits employing strategies that encourage students to work collaboratively in small groups is likely to result in feelings of connection to others and belongingness.

The positive association between pathway and community connotes that, among pharmacy students, those in the distance pathway tend to feel higher levels of classroom community than campus students. This outcome is somewhat surprising for several reasons. First, the literature is replete with studies demonstrating distance students feel isolated and lack feelings of community (Conrad & Donaldson, 2004; Haythornthwaite et al., 2000; Kazmer, 2004; McPherson & Nunes, 2004; Twigg, 1997), just the opposite

of the findings for the pharmacy students. Second, the pharmacy courses are relatively large for online courses, with enrollments between 67-71 students. The literature suggests small classes are best to provide quality online learning experiences including development of community among students (Aragon, 2003; Hanna, et al., 2000; Ko & Rossen, 2010; Palloff & Pratt, 2007; Rovai 2002a; Swan, 2002). Several factors may explain this unexpected outcome. One explanation may be that each instructor in the pharmacy courses has a minimum of four years experience teaching in the distance pathway. Some researchers posit experienced online instructors tend to be more skilled at creating a sense of community among their students (Drago, Peltier, & Sorensen, 2002; Mishra & Koehler, 2006). The use of educational mentors for the distance pathway may also provide some rationale for this outcome. Educational mentors are program alumni, practicing pharmacists, or graduate students serving as teaching assistants to work with online pharmacy students. The use of mentors likely decreases the transactional distance and helps the class function more like smaller classes in which instructors are able to get to know the students and provide timely responses. Furthermore, online pharmacy students meet on campus each summer to complete hands-on laboratory requirements. Opportunities to meet face-to-face throughout a program of study have been shown to result in increased feelings of connectedness and satisfaction among students (Conrad, 2005); therefore the on-campus component of the distance pharmacy pathway may provide an explanation for this finding.

Occupational Therapy Student Outcomes

Almost 30% of the variance in Occupational Therapy student CCS scores could be explained by the set of course and student variables. Given this moderate level of accountability for score variance, attention should be paid to these sets of variables for those concerned with classroom community in Occupational Therapy education. Two variables, one course variable (outcome type, negative association) and one student variable (estimated grade, positive association) were found to be significant predictors of community. Similar to on-ground student and pharmacy student sub-groups, data analysis for the occupational therapy students identified a negative but and significant predictive relationship for outcome type and CCS score variance. The meaning of this outcome and the literature associated with this finding is detailed in the discussion of on-ground student findings.

Results for the estimated course grade variable point to a positive and significant predictive relationship between this variable and CCS score variance. As noted in the discussion of outcomes for on-ground students and online students, this outcome signifies higher estimated course grades are associated with higher levels of community. Again, the literature associated with this outcome is cited and summarized in the discussion of outcomes for on-ground students.

In summary, several unexpected outcomes were found in the analysis of the data for each of the four subgroups. As noted throughout the discussion of each group's findings, further research is needed.

Recommendations for Further Research

Research results presented in this study indicated a variety of course and student characteristics influence students' feelings of community. These variables included the student's pathway (campus or distance), their year in the program, estimated grade for the course, amount of small group work, gender, type of learning outcome identified for the course and level of difficulty of the subject matter. Some outcomes from this study were congruent with the previously published research while others were in contradiction. Further research is warranted to better understand the constructs which influence a sense of community among learners. As external stakeholders (e.g., accreditation agencies, US Department of Education) continue to increase their level of scrutiny of higher education, administrators and instructors must learn more about factors impacting student success. Building community among learners is among these factors.

Replication of this study to include a larger number of health science programs and therefore more students would help determine the degree to which the findings are generalizable to other programs. This study was conducted in a unique educational context. Both the distance and campus courses were taught by the same instructor, at the same time and used the same learning materials. Online students were taking 13 to 18 credit hours and all students were enrolled in a cohort model program. Therefore, the results found in this study may or may not apply to different educational contexts. As Arbaugh, Bangert and Cleveland-Innes (2010) noted, exploration of sense of community taking into account various educational contexts is needed.

Additional investigation of the significant findings identified in this study is necessary. Correlations for the significant findings were weak and therefore cannot be assumed to accurately represent relationships between the characteristics and feelings of classroom community in other contexts. Further study of the relationship between student or course variables to students' feelings of community is required.

In addition to the weak relationships between the study's variables and CCS scores, findings revealed mixed direction in the relationship between the variables and students' feelings of community. Some variables were found to be positively related to community while others were negatively related. Examination of the underlying variables influencing the direction of the relationships would provide scholars as well as practitioners valuable information to assist them in optimizing community among learners. In particular, the dichotomy of findings among online and on-ground students merits further investigation. For example, one would expect all students' sense of community to become stronger the longer they remain with their cohort; however this was not the case for online students, for whom a decrease in feeling of community occurred from the first year to the third year in the program. Identification of the reasons underpinning the unexpected outcome for online students could provide stakeholders in online education insight into factors impacting this outcome which may be useful in shaping other online programs or courses. A second area worthy of additional analysis is the higher levels of community reported by pharmacy students in the distance pathway than by those in the campus pathway. Again, additional research is necessary to confirm this outcome. If indeed the outcome is found to be valid, then it behooves researchers in

the field of distance education to delve further to determine the factors resulting in distance students feelings of connectedness and satisfaction. The third characteristic of particular interest for further investigation is gender; male online students were found to have higher community than female online students. Given that prior studies identified females as more likely to feel connected with other learners, this outcome deserves additional study. The negative association between small group work and online students' feelings of community, which contradicts the vast majority of literature, is the fourth outcome warranting additional investigation. One would expect mitigating variables affected this outcome, so identification of the variables will provide educators and administrators valuable information which would allow them to proactively mitigate risks to community caused by these variables. The sensitivity of the measurement for use of small group work may have also influenced the outcomes. Investigation into the effectiveness of the method used to measure the various levels of small group work in each course is needed. The last variable in need of further examination to identify the discrepancy between online and on-ground student outcomes is outcome type. Understanding the reasons for the different outcomes could provide stakeholders important information related to disciplinary effects on teaching effectiveness. The call for more research in this area by scholars was noted in the discussion of on-ground and online student outcomes.

Further investigation of the agency of community is warranted to explore the roles of students, instructors and administrators in initiating and sustaining a sense of community. This study focused on student demographic characteristics and the

investigator did not gather information about instructors of the courses included in the study nor administrators. As this discussion of the study outcomes suggests, factors other than those investigated may play a role in the creation of a sense of community.

As noted throughout this chapter, several unexpected outcomes were found in the analysis of the data for each of the four subgroups. One area worthy of investigation is the Classroom Community Scale. This study used the total CCS score as a measure of students' feeling of community. The scale includes two sub-scales, connectedness and learning, which could be used to gather additional information. Furthermore, a comparison of the CCS scale and other recognized tools for measuring community is suggested, namely a comparison of outcomes using the Community of Inquiry survey (Swan, Shea, Richardson, Ice, Garrison, Cleveland-Innes & Arbaugh, 2008) to continue to identify criteria which effectively measure community among various groups of students.

Recommendations for Practice

This study was designed to identify variables that can be used by administrators responsible for health science education courses to proactively identify courses that should receive priority attention to help advance sense of community among students. Outcomes of the study identified predictive variables significantly related to community.

The recommendations for practice presented in this section encompass a synthesis of the previous discussion of findings in a framework relevant for the study's target

audience, administrators working in higher education health sciences programs.

Recommendations are presented for campus courses, for distance courses, for doctor of pharmacy courses, and for doctor of occupational therapy courses. Administrators will likely be interested in how the study outcomes apply to courses in a particular program (pharmacy education or occupational therapy education) or an educational context (distance or campus) as opposed to grouping findings by the variables used in the study.

Campus Courses

Study outcomes indicate that students enrolled in campus courses with primarily cognitive learning outcomes are at risk for lower community. Additionally, based on students' self report of their grade in the course, higher grades tend to connote increased levels of community. Therefore, in order to identify campus courses that may be at risk of low community, administrators are encouraged to identify courses which are based on cognitive learning outcomes or in which student grades have historically been low. Instructors of courses at risk for low community should be encouraged and provided the appropriate support and resources to incorporate higher levels of small group work in their course.

Distance Courses

Based on findings from the study, distance courses at risk of low community include:

- courses which occur in the later part of the program
- courses in which student grades have historically been low

- courses with greater proportion of female students (male students were found to have higher feelings of community)
- courses in which the mean age of students is higher

Administrators are encouraged to identify courses with the characteristics noted above. Although the study outcomes did not identify instructional strategies for distance courses (e.g., use of small group activities) that could be implemented to mitigate low sense of community, some of the findings contradict the bolus of published literature. Therefore, administrators are encouraged to carefully track student progress in the courses at risk for low community and employ best practices for building community among distance students, including proactive development and support of faculty to facilitate virtual community development.

Doctor of Pharmacy Courses

Study outcomes for pharmacy students indicate three predictor variables: outcome type, amount of small group work, and pathway. Two of these variables, outcome type and amount of small group work, were also predictor variables for campus courses. As previously noted, pharmacy students were the only group for which estimated grade was not a significant predictor of community. However, based on the rationale provided in the discussion of pharmacy student outcomes, grade will be included as a factor in the recommendations for practice.

Administrators responsible for pharmacy education programs are encouraged to provide resources to proactively mitigate low community in campus courses, courses in

which the learning outcomes are mainly cognitive, and courses in which student grades have historically been low. Amount of small group work was shown to be a predictor of community for pharmacy students, therefore administrators are encouraged to provide resources to support the development of community, and these may include faculty preparation and teaching assistance.

Doctor of Occupational Therapy Courses

Given the predictor variables found to be significant for occupational therapy students (outcome type and estimated course grade), administrators of occupational therapy educational programs are encouraged to identify courses with primarily cognitive outcomes and in which student grades are usually low as being at risk of low community. As with distance courses, the study outcomes did not identify instructional strategies (e.g., use of small group activities) to mitigate low community in occupational therapy courses. Nevertheless, administrators are encouraged to employ best practices for building community, including proactive development and support of occupational therapy faculty.

The presence of classroom community among online and on-ground students enrolled in a doctor of pharmacy or in a doctor of occupational therapy program was investigated in this study. The set of course variables (small group work, learning outcome type, and subject matter difficulty) and the set of student variables (pathway, year in program, number of hours employed, course grade, gender, and age) were shown to predict students' feelings of classroom community at a moderate level. Multiple

regression analysis identified the degree to which individual variables in each set contributed to the ability to predict the presence of community among students. The set of predictor variables was shown to be different for each sub-group of students. Predictor variables for on-ground students included amount of small group work, course learning outcome type, and the students' self-reported estimated grade. For online students, year in the program, estimated grade in the course, gender and age were shown to be the best predictors of community. Among pharmacy students the amount of small group work and the course primary type of learning outcome best predicted the degree to which students' felt a sense of community. A course's primary type of learning outcome and the students' estimated grades were the best predictors of community for occupational therapy students.

REFERENCES

- Abedin, B., Daneshgar, F., & D'Ambra, J. (2010). Underlying factors of sense of community in asynchronous computer supported collaborative learning environments. *MERLOT Journal of Online Learning and Teaching*, 6(3), 585-596.
- Akyol, Z., & Garrison, D. R. (2008). The development of a community of inquiry over time in an online course: Understanding the progression and integration of social, cognitive and teaching presence. *Journal of Asynchronous Learning Networks*, 12(3-4), 3-22.
- Allen , I. E., & Seaman, J. (2011). Going the distance: Online education in the United States. Retrieved from <http://sloanconsortium.org/publications/survey/index.asp>.
- Anderson, T., Rourke, L, Garrison, R. D., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks*, 5(2), 1-17.
- Angelo, T. A. (1999). Doing assessment as if learning matters most. *AAHE Bulletin*, 52, 3-6.
- Aragon, S. R. (2003). Creating social presence in online environments. *New Directions for Adult and Continuing Education Special Issue: Facilitating Learning in Online Environments*, 100, 57-68.

- Arbaugh, J. B. (2005). How much does “subject matter” matter? A study of disciplinary effects in on-line MBA courses. *Academy of Management Learning & Education*, 4, 57–73.
- Arbaugh, J., B., Bangert, A., & Cleveland-Innes, M. (2010). Subject matter effects and the Community of Inquiry (CoI) framework: An exploratory study. *The Internet and Higher Education*, 13, 37-44.
- Arbaugh, J. B., & Benbunan-Fich, R. (2007). The importance of participant interaction in online environments. *Decision Support Systems*, 43, 853-865.
- Ashar, H., & Skenes, R. (1993). Can Tinto’s student departure model be applied to nontraditional students? *Adult Education Quarterly*, 43(2), 90-100.
- Babiyak, M. A. (2004). What you see may not be what you get: A brief, nontechnical introduction to overfitting in regression-type models. *Psychosomatic Medicine*, 66 (3), 411-421.
- Basken, P. (2011, November 13). Colleges fear tough budget news from congressional supercommittee. *Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/Colleges-Fear-Tough-Budget/129752/>
- Baturay, M. H., & Bay, O. F. (2010). The effects of problem-based learning on the classroom community perceptions and achievement of web-based education students, *Computers & Education*, 55 (1), 43-52.

- Becher, T. (1994). The significance of disciplinary differences. *Studies in Higher Education, 19*(2), 151.
- Beldarrain, Y. (2006). Trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education 27*(2), 139-153.
- Benbunan-Fich, R. & Hiltz, S. R. (2003). Mediators of the effectiveness of online courses. *IEEE Transactions on Professional Communication, 46*(4). 298-312.
- Bentz, D. T. (2010). *Online and Face-to-Face Classes: A comparative analysis of teaching presence and instructor satisfaction*. Retrieved from DigitalCommons@University of Nebraska - Lincoln.
<http://digitalcommons.unl.edu/cehsdiss/53>
- Bernard, R. M., Abrami, P. C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L.,...Huang, B. (2004). How does distance education compare with classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research, 74*(3), 379-439.
- Biemiller, L. (2011, October 23). Atlanta colleges strive to outrun the recession. *Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/Colleges-Struggle-to-Outrun/129487/>
- Blumenfeld, P. C., Marx, R. W., Soloway, E., & Krajcik, J. (1996). From small group cooperation to collaborative communities. *Educational Researcher, (25)*8, 37-40.

- Boettchner, J. V., & Conrad, R. M. (2004). Faculty guide for moving teaching and learning to the web. Phoenix: League for Innovation in the Community College.
- Brook, C., & Oliver, R. (2002). Supporting the development of learning communities in online settings. *Paper presented at the Ed-Media Conference*, Denver, Colorado.
- Brower, A. M., & Dettinger, K. M. (1998). What is a learning community? Toward a comprehensive model. *About Campus*, 3(5), 15-21.
- Brown, A. L. (1994). The advancement of learning. *Educational Researcher*, (23)8, 4-12.
- Brown, R. E. (2001). The process of community building in distance learning classes. *Journal of Asynchronous Learning Networks*, 5(2), 18-35.
- Carey, J. M. (2001). Effective student outcomes: A comparison of online and face-to-face delivery modes. Retrieved from [http://teleeducation.nb.ca/content/pdf/english/DEOSNEWS 11.9 effective-studentoutcomes.pdf](http://teleeducation.nb.ca/content/pdf/english/DEOSNEWS%2011.9%20effective-studentoutcomes.pdf)
- Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *Chronicle of Higher Education*, 46(23), 38-41.
- Caywood, K., & Duckett, J. (2003). Online vs. on-campus learning in teacher education. *Teacher Education and Special Education*, 26(2), 98-105.

- Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. Retrieved from:
http://people.ucsc.edu/~gwells/Files/Courses_Folder/documents/chaiklin.zpd.pdf
- Chapman, T. A. (2012). Variables associated with sense of community in online and on-ground clinical doctoral education. Unpublished dissertation.
- Charness, N., & Boot, W. R. (2009). Aging and information technology use. *Current Directions in Psychological Science*, 18(5), 253-258.
- Chavis, D. M. M., Hogge, J. H., McMillan, D. W., & Wandersman, A. (1986). Sense of community through Brunswik's lens: A first look. *Journal of Community Psychology*, 14(1), 24-40.
- Chen, Y. J. (2001). Dimensions of transactional distance in the world wide web learning environment: A factor analysis. *British Journal of Educational Technology*, 23(4), 459-470.
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *The Wingspread Journal*, 9 (2).
- Chyung, S. Y. (2001). Systemic effects of improving the motivational appeal of online instruction on adult distance education. *Paper presented at the 82nd annual meeting of the American Education Research Association (AERA)*, Seattle, WA.

Clark, R. C., & Mayer, R. E. (2011). *eLearning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning*. San Francisco: Pfeiffer.

Conrad, D. (2005). Building and maintaining community in cohort-based online learning. *Journal of Distance Education*, 20(1), 1-20.

Conrad, R., & Donaldson, J. A. (2004). *Engaging the online learner*. San Francisco: Jossey-Bass.

Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson Education.

Cross, K. P. (1998). Why learning communities? Why now? *About Campus*, 3(3), 4-11.

Dawson, S. (2006). A study of the relationship between student communication interaction and sense of community. *The Internet and Higher Education*, 9(3), 153-162.

Dawson, S. (2008). A study of the relationship between student social networks and sense of community. *Educational Technology & Society*, 11(3), 224-238.

Dewey, J. (1909). *Moral Principles in Action*. *Riverside Educational Monographs* (1-60). Boston: Houghton Mifflin.

- DiRamio, D., & Wolverton, M. (2006). Integrating learning communities and distance education: Possibility or pipedream? *Innovative Higher Education*, 31(2), 99-113.
- Drago, W., Peltier, J., & Sorensen, D. (2002). Course content or the instructor: Which is more important in on-line teaching? *Management Research News*, 25(6/7), 69–83.
- Etzioni, A. (1993). *The spirit of community: Rights, responsibility, and the communitarian agenda*. New York: Crown.
- Falvo, D. A., & Solloway, S. (2004). Constructing community in a graduate course about teaching with technology. *TechTrends*, 48(5), 54-62.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105.
- Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. *The Internet and Higher Education*, 1, 157-172.
- Gravetter, F., J., & Wallnau, L., B. (2009). *Statistics for behavioral sciences*, 8th Edition. Belmont, CA: Wadsworth.

- Gunawardena, C. N., & Zittle, F. (1997). Social presence as a predictor of satisfaction within a computer mediated conferencing environment. *American Journal of Distance Education, 11*(3), 8-26.
- Hale, L. S., Mirakian, E. A., & Day, D. B. (2009). Online vs. classroom instruction: Student satisfaction and learning outcomes in an undergraduate allied health pharmacology course. *Journal of Allied Health, 38*(2), 36-42.
- Hanna, D. E., Glowacki-Dudka, M., & Conceigao-Runlee, S. (2000). *147 practical tips for teaching online groups: Essentials of web-based education*. Madison, WI: Atwood Publishing.
- Harasim, L. (2012). *Learning theory and online technologies*. New York: Routledge
- Haythornthwaite, C., Kazmer, M. M., Robins, J., & Shoemaker, S. (2000). Community development among distance learners: Temporal and technological dimensions. *Journal of Computer-Mediated Communications, 6*(1). Retrieved from <http://jcmc.indiana.edu/vol6/issue1/haythornthwaite.html?ref=Sex%C5%9Ehop.com>
- Higher Learning Commission (2011). *Substantive change delivery application: Distance delivery*.
- Hill, J. P. (1996). Psychological sense of community: Suggestions for future research. *Journal of Community Psychology, 24*(4), p. 431-438.

- Hill, P. (1985, October 2). The rationale for learning communities. Speech, Inaugural Conference on Learning Communities of the Washington Center for Undergraduate Education. Retrieved from <http://www.evergreen.edu/washcenter/resources/upload/rationale1.pdf>
- Johnson, S. D., Aragon, S. R., Shaik, N., & Palma-Rivas, N. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face-to-face learning environments. *Journal of Interactive Learning Research*, 11(1), 29-49.
- Kazmer, M. (2004). Online identity: Implications for course design. *Online Classroom (January)*, 6-7.
- Kirk, R., E. (1996). Practical significance: A concept whose time has come. *Educational and Psychological Measurement*, 56(5), 746-759.
- Ko, S., & Rossen, S. (2010). *Teaching online: A practical guide*. New York: Routledge.
- Kreijns, K., Kirschner, P. A., & Jochems, W. (2003). Identifying the pitfalls for social interaction in computer-supported collaborative learning environments: A review of the research. *Computers in Human Behavior*, 19, 335-353.
- Laffey, J., Lin, G., & Lin, Y. (2006). Assessing social ability in online learning environments. *Journal of Interactive Learning Research*, 17(2), 163-177.

- Lear, J., Ansorge, C., Steckelberg, A. (2010). Interactivity/community process model for the online education environment. *MERLOT Journal of Online Learning and Teaching*, 6(1). Retrieved from http://jolt.merlot.org/vol6no1/lear_0310.htm.
- Learning Taxonomy-Krathwohl's Affective Domain, (n.d.). Retrieved from http://assessment.uconn.edu/docs/LearningTaxonomy_Affective.pdf
- Lehman, R. M., & Conceição, S. C. O. (2010). *Creating a sense of presence in online teaching: How to “be there” for distance learners*. San Francisco: Jossey-Bass.
- Lindblom-Ylänne, S., Trigwell, T., Nevgia, A., & Ashwin, P. (2006). How approaches to teaching are affected by discipline and teaching context. *Studies in Higher Education*, 31(3), 285–298.
- Liu, X., Magjuka, R. J., Bonk, C. J., & Lee, S. (2007). Does sense of community matter? An examination of participant's perceptions of building learning communities in online courses. *The Quarterly Review of Distance Education*, 8(1), 9-24.
- Ludwig, Hardman, S., & Dunlap, J. C. (2003). Learner support services for online students: Scaffolding for success. *The International Review of Research in Open and Distance Learning*, 4(1), 1-15.
- Lueddeke, G. (2003). Professionalising teaching practice in higher education: a study of disciplinary variation and 'teaching-scholarship.' *Studies in Higher Education*, 28, 213–228.

Mager, R. (1999). *Observable verbs for cognitive domain instructional objectives*.

Retrieved from <http://www2.gsu.edu/~mstmbs/CrsTools/cogverbs.html>

McCarthy, S. A., & Samors, R. J. (2009). Online learning as a strategic asset. APLU-

Sloan National Commission on Online Learning. Retrieved from

<http://sloanconsortium.org/publications/survey/index.asp>.

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.

McLaren, C. H. (2004). A comparison of student persistence and performance in online

and classroom business statistics experiences. *Decision Sciences Journal of*

Innovative Education, 2(1), 1-10.

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

315-326.

McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory.

Journal of Community Psychology, 14(1), 6-23.

McPherson, M., & Nunes, M. B. (2004). The failure of virtual social space (VSS)

designed to create a learning community: Lessons learned. *British Journal of*

Educational Technology, 35(3), 305-321.

- Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. Project Report. Centre for Learning Technology. Retrieved from <http://repository.alt.ac.uk/629/>
- National Association of State Budget Officers. (2011). The fiscal survey of the states: An update of state fiscal conditions, Spring 2011.
- National Survey of Student Engagement. (2009). Assessment for improvement: Tracking student engagement over time, annual results 2009. Retrieved from http://nsse.iub.edu/NSSE_2009_Results
- Ni, S. F., & Aust, R. (2008). Examining teacher verbal immediacy and sense of classroom community in online classes. *International Journal on E-Learning*, 7(3), 477-498.
- O'Brien, B., & Renner, A. (2002). Online student retention: Can it be done? Paper presented at the ED-MEDIA 2002 World Conference on Educational Multimedia, Hypermedia & Telecommunications, Denver, CO.
- Palloff, R. M., & Pratt, K. (2007). *Building online learning communities: Effective strategies for the virtual classroom*. San Francisco: Jossey-Bass.
- Princeton University (n.d.). Data and statistical services: Introduction to regression Analysis. Retrieved from http://dss.princeton.edu/online_help/analysis/regression_intro.htm.

- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.
- Quality Matters (2011). Quality matters rubric standards 2011-2013 edition with assigned point values. Retrieved from http://www.qmprogram.org/files/QM_Standards_2011-2013-3.pdf.
- Rogers, P., & Lea, M. (2005). Social presence in distributed group environments: The role of social identity. *Behavior & Information Technology*, 24(2), 151 - 158.
- Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001). Assessing social presence in asynchronous, text-based computer conferencing. *Journal of Distance Education*, 14(3), 51-70.
- Rovai, A. P. (2001). Building classroom community at a distance: A case study. *Educational Technology Research and Development*, 49(4), 33-48.
- Rovai, A. P. (2002a). A preliminary look at the structural differences of higher education classroom communities in traditional and ALN courses. *Journal of Asynchronous Learning Networks*, 6(1): 41-56.
- Rovai, A. P. (2002b). Building a sense of community at a distance. *International Review of Open and Distance Learning*. 3(1), 1-16.
- Rovai, A. P. (2002c). Development of an instrument to measure classroom community. *The Internet and Higher Education*, 5, 197-211.

- Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet and Higher Education*, 6, 1–16.
- Rovai, A.P., & Baker, J.D. (2005). Gender differences in online learning: Sense of community, perceived learning, and interpersonal interactions. *The Quarterly Review of Distance Education*, 6(1), 31-44.
- 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. *The Journal of Negro Education*, 74(4), 359-370.
- Rovai, A. P., & Jordan, H. M. (2004). Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Review of Open and Distance Learning*, 5(2). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/192/274>
- Rovai, A. P., & Ponton, M., K. (2005). An examination of sense of classroom community and learning among African American and Caucasian graduate students. *Journal of Asynchronous Learning Networks*, 9(3), 77-92.
- Rovai, A. P., & Wighting, M. J. (2005). Feelings of alienation and community among higher education students in a virtual classroom, *The Internet and Higher Education*, 8(2), 97-110.

- Russell, T. L. (2001). The no significant difference phenomenon: A comparative research annotated bibliography on technology for distance education. Raleigh, NC. North Carolina State University.
- Sadera, W. A., Robertson, J., Song, L., & Midon, M. N. (2009). The role of community in online learning success. *MERLOT Journal of Online Learning and Teaching*, 5(2), 227-282.
- Salas, E., Kosarzycki, M. P., Burke, C. S., Fiore, S. M., & Stone, D. L. (2002). Emerging themes in distance learning research and practice: Some food for thought. *International Journal of Management Reviews*, 4(2), 135-153.
- Sarason, S.B. (1974). *The psychological sense of community: Prospects for a community psychology*. San Francisco: Jossey-Bass.
- Schön, D. A. (1995). The new scholarship requires a new epistemology. *Change*, 27, 27–34.
- Shannon, D., M. (2002). Effective teacher behaviors and Michael Moore's theory of transactional distance. *Journal of Education for Library and Information Science* (43) 1, 43-46.
- Shea, P. J. (2006), A study of students' sense of learning community in online environments. *Journal of Asynchronous Learning Networks*, 10(1), 35-44.

- Shea, P. J., Li, C. S., Swan, K., & Pickett, A. (2005). Developing learning community in online asynchronous college courses: The role of teaching presence. *Journal of Asynchronous Learning Networks*, 9(4), 59-82.
- Shea, P. J., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *The Internet and Higher Education*, 9, 175-190.
- Shelton, K. (2010). *A quality scorecard for the administration of online education programs: A delphi study*. Retrieved from ProQuest Digital Dissertations. (UMI Number: 3423965).
- Shulman, L. S. (1999). Taking learning seriously. *Change*. July/August, 11-17.
- Shulman, L. S. (2002). Making differences: A table of learning. *Change*, November/December, 37-44.
- Sitzmann, T., Kraiger, K., Stewart, D., & Wisher, R. (2006). The comparative effectiveness of web-based and classroom instruction: A meta-analysis. *Personnel Psychology*, 59(3), 623-664.
- Smith, B. (1991). Taking structure seriously. *Liberal Education*, 77(2), 42.
- Smith, B. (2001, March 3). The challenge of learning communities as a growing national movement. Presentation, Association of American Colleges and Universities Conference on Learning Communities. Providence, Rhode Island. 1-9.

- Smith, B. (2003). Learning communities and liberal education: New ways of organizing curricula can encourage coherence and collaboration in liberal learning, while adding to its charisma. *Academe, January-February*. 14-18.
- Smith, D. R. (2008). *Learning style preference, sense of classroom community, gender, age, and previous experience within computer-mediated instruction (CMI)*. (Doctoral dissertation). Retrieved from ProQuest. (3307192)
- Stockburger, D., W. (n.d.). *Multivariate Statistics: Concepts, Models, and Applications*. Retrieved from <http://www.psychstat.missouristate.edu/multibook/mlt06m.html>.
- Summers, J. J., Waigandt, A., & Whittaker, T. A. (2005). A comparison of student achievement and satisfaction in an online versus a traditional face-to-face statistics class. *Innovative Higher Education*, 29(3), 233-250.
- Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education, Communication, & Information*, 2(1), 23-49.
- Swan, K., & Shih, L. F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks*, 9 (3), 115-136.
- Tallent-Runnels, M. K., Thomas, J. A., Lan, W. Y., Cooper, S., Ahern, T. C., Shaw, S. M., & Liu, A. (2006). Teaching courses online: A review of the research. *Review of Educational Research*, 76(1), 93-136.

- Tinto, V. (1995). Learning communities, collaborative learning, and the pedagogy of educational citizenship. *AAHE Bulletin*, 47 (7), 11–13.
- Tinto, V. (2000). What have we learned about the impact of learning communities on students? *Assessment Update*, 12(2), 1-2.
- Tinto, V. (2003). Learning better together: The impact of learning communities on student success. *Higher Education monograph series, 2003-1*. Higher Education Program, School of Education, Syracuse University, 1-8.
- Trigwell, K. (2002). Approaches to teaching design subjects: a quantitative analysis. *Art, Design and Communication in Higher Education*, 1, 69–80.
- Tsai, I., Kim, B., Liu, P., Goggins, S. P., Kumalasari, C., & Laffey, J. M. (2008). Building a model explaining the social nature of online learning. *Educational Technology & Society*, 11(3), 198-215.
- Twigg, C. A. (1997). Is technology the silver bullet? *Educom Review*, March- April, 28-29.
- Tyler-Smith, K. (2006). Early attrition among first time elearners: A review of factors that contribute to drop-out, withdrawal and non-completion rates of adult learners undertaking elearning programmes. *MERLOT Journal of Online Learning and Teaching*, 12(2). Retrieved from <http://jolt.merlot.org/vol2no2/tyler-smith.htm>.

- United States Department of Education (2008). Higher Education Opportunity Act of 2008. Retrieved from <http://www2.ed.gov/policy/highered/leg/hea08/index.html>
- Vealé, B. (2009). Transactional distance and course structure: A qualitative study. Open Access Theses and Dissertations from the College of Education and Human Sciences, University of Nebraska. Paper 51. Retrieved from <http://digitalcommons.unl.edu/cehsdiss/51>
- Vann, B. A., & Hinton, B. E. (1994). Workplace social networks and their relationship to student retention in on-site GED programs. *Human Resources Development Quarterly*, 5(2), 141-151.
- Visser, J. (2003). Distance education in the perspective of global issues and concerns. In M. G. Moore and W. G. Anderson (Eds.) *Handbook of distance education* (793-810). Mahwah, NJ: Lawrence Erlbaum.
- Walker, B. K. (2008). Bridging the distance: How social interaction, presence, social presence and sense of community influence student learning experiences in an online virtual environment. Greensboro, NC: The University of North Carolina. Retrieved from <http://libres.uncg.edu/ir/uncg/listing.aspx?id=136>
- Wallace, R. M. (2003). Online learning in higher education: A review of research on interactions among teachers and students. *Education, Communication & Information*, 3(2), 241-280.

Westheimer, J., & Kahne, J. (1993). Building school communities: An experience-based model. *The Phi Delta Kappan*, 75 (4), 324-328.

Whipple, W. R. (1987) Collaborative learning. *AAHE Bulletin*, 40 (2), 3–7.

Wilson, B. G., Ludwig-Hardman, S., Thornman, C., & Dunlap, J. C. (2004). Bounded community: Designing and facilitating learning communities in formal courses. *The International Review of Research in Open and Distance Learning*, 5(3).
Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/204/286>

APPENDIX A: CLASSROOM COMMUNITY SCALE INSTRUMENT AND ADDITIONAL SURVEY ITEMS

Classroom Community Scale

[A.P. Rovai / Internet and Higher Education 5 (2002) 197–211]

Directions: Below you will see a series of statements concerning [name of course]. Read each statement carefully and select the statement that comes closest to indicating how you feel about the course. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, select neutral (N). Do not spend too much time on any one statement, but give the response that seems to describe how you feel.

	Strongly agree (SA)	Agree (A)	Neutral (N)	Dis- agree (D)	Strongly disagree (SD)
1. I feel that students in this course care about each other					
2. I feel that I am encouraged to ask questions					
3. I feel connected to others in this course					
4. I feel that it is hard to get help when I have a question					
5. I do not feel a spirit of community					
6. I feel that I receive timely feedback					
7. I feel that this course is like a family					
8. I feel uneasy exposing gaps in my understanding					
9. I feel isolated in this course					
10. I feel reluctant to speak openly					
11. I trust others in this course					
12. I feel that this course results in only modest learning					
13. I feel that I can rely on others in this course					
14. I feel that other students do not help me learn					
15. I feel that members of this course depend on me					
16. I feel that I am given ample opportunities to learn					
17. I feel uncertain about others in this course					
18. I feel that my educational needs are not being met					
19. I feel confident that others will support me					
20. I feel that this course does not promote a desire to learn					

Data from the following items will be used to help the researcher identify variables related to the sense of community score obtained from survey items 1-20.

21. Select the pathway within the program in which you are enrolled.

Campus

Distance

22. Select your current year in your program of study

1

2

3

23. Please indicate the average number of hours you were employed each week during this semester (whole numbers only please).

[Text box]

24. Select your current grade in this course. If you are not sure what your exact grade is, select the response that best represents what you estimate your current grade to be.

A

B

C

D

F

25. Please indicate the level of difficulty of the subject matter in this course.

4= Very difficult

3= Difficult

2= Easy

1= Very easy

26. Please indicate your gender.

Female

Male

27. Please indicate your current age (whole numbers only please).

[Text box]

APPENDIX B: DESCRIPTION OF SCHOOL AND PROGRAMS INCLUDED IN THE STUDY

The school included in the study is part of a mid-sized, private, faith-based higher educational institution located in the Midwestern United States. The school includes three clinical doctorate programs, pharmacy, occupational therapy and physical therapy. Two of the three programs (pharmacy and occupational therapy) have both campus and distance pathways leading to the clinical doctorate degree. Enrollment in the school is approximately 1100 students.

The Doctor of Pharmacy program enrolls 115 students in the campus pathway and 70-75 students in the distance pathway each year. Admission requirements include a minimum of two years of undergraduate work which includes specific course work, a minimum score on the Pharmacy College Admission Text, personal statement, and face-to-face interview. Only full-time students are admitted. Online students are located throughout the 50 states. The program is 4 years in length. The last year of the program is comprised exclusively of clinical rotations, no didactic course work. The curriculum is offered in a lock-step fashion; each semester students enroll in a prescribed set of courses. All students in a given graduating class enroll in the same courses. Each course is taught as a single section; therefore all students have the same instructor(s) for each course. The program's curriculum includes 101 credit hours of didactic and lab-based courses which are taught in two, 15-week semesters each academic year, followed by 40 credit hours of clinical rotations. Each didactic semester includes 15 to 18 credit hours. Laboratory experiences are embedded throughout the curriculum for the on-ground

students. Online students come to the campus each summer for five to ten days for laboratory experiences.

The Doctor of Occupational Therapy program enrolls 45 students in the campus pathway and 10 students in the distance pathway each year. Admission requirements include a minimum of a bachelor's degree which includes specific course work, a personal statement, and face-to-face interview. No part-time students are admitted to the program. The distance pathway is facilitated through a partnership with a public university in another state. All online students are required to live within a few hours' driving distance of the public university's campus, which provides the facilities for the laboratory portions of the curriculum. All students in the program engage in six semesters of didactic course work. One credit hour of clinical rotations is included in each of the didactic semesters. The last two semesters of the program are primarily composed of clinical rotations, with one credit hour of seminar studies required for each of these semesters. The program's curriculum includes 93 credit hours of didactic and lab-based courses which are taught in 15-week semesters and 51 credit hours of clinical rotations. The program includes three terms each academic year. The curriculum is offered in a lock-step fashion in which all students, on-ground and online, in a given class take the same courses at the same time from the same instructors(s) during the first six semesters of the program. The class sequence is prescribed by the curriculum. Each semester includes 13-18 credit hours. Laboratory experiences are embedded throughout the curriculum for both the on-ground and online students.

The Angel Learning Management™ system is used for all online courses. In addition to the tools available in Angel, instructors and students (online and on-ground) have access to the University's web conferencing solution, Wimba™. This solution provides synchronous audio, video, and document sharing as well as text chat tools. Additionally, synchronous sessions may be recorded for later viewing. Electronic exams are used in both programs for online and on-ground students. Exams for online students are proctored; students go to an exam proctor location near their home to take each exam. The school must approve any proctor used by an online student. Electronic exams for the pharmacy program are delivered using QuestionMark™ software. The occupational therapy program uses ExamSoft™ for electronic exams. All lectures delivered for on-ground students are captured using Echo³⁶⁰™ and made available to distance students within 24 hours. The lecture capture includes audio and video of the instructor as well as anything shown through the classroom data projector.

eLearning support is provided to the faculty by a team of instructional designers, an instructional technologist, and two application administrators for electronic exams. The team is located within the school. Team members work with faculty in the development of online/blended teaching pedagogy skills, designing content for the online teaching and learning environment, assembling online courses, learning to use the technologies for campus and distance courses, and assembling electronic exams.

All faculty and students are issued a tablet computer preconfigured with a variety of software, including Microsoft Office™. The cost of the computer, software, and

technology support is embedded in students' tuition, they incur no out-of-pocket expense.

Students keep the same computer for the duration of their program of study. Faculty computers are refreshed every 4 years.

Technical support for all faculty and students in the school is provided by a team of information technology professionals within the school. The team includes help desk personnel, a database administrator, and systems administrator. Support is available Monday-Friday 7:45 AM – 6:00 PM Central Time. A toll-free number is available for online students as well as exam proctors.

APPENDIX C: CONTENT OF INITIAL AND FOLLOW-UP EMAIL INVITATIONS

Dear [insert name of student using email merge]:

I am writing to invite your participation in a dissertation research study. Participants completing the 10-minute survey will be provided a Creighton University branded flash drive. The study and the Notice of Informed Consent are accessible from [URL]. Responses to the survey are anonymous and the survey will be available until [date].

The study is examining variables associated with students' feelings of community in online and on-ground courses. As a student enrolled in the [name of program], your views on the degree to which a sense of community exists in [name of course] is important to this study. There are no known risks, participation is entirely voluntary, and you are free to withdraw at any time.

The short web-based survey should take 10 minutes or less to complete. After submitting the survey, a confirmation page will appear which can be redeemed for a Creighton University branded flash drive. Directions for redeeming the confirmation page are included on the page.

All survey responses are anonymous; no information is collected that allows me to connect the survey responses to an individual student.

If you have questions about the survey please contact me using the information in the email signature below.

Your perspectives on the sense of community will provide important insights and information. Your assistance with this research is very much appreciated.

Thank you very much!

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First Follow-up Email Invitation

I am writing to invite your participation in a dissertation research study examining classroom community. If you have already completed the survey, I thank you very much; please make sure you receive your Creighton University branded flash drive.

If you have not had a chance to complete the short 10-minute survey, please take a few moments to do so now [URL]. Survey responses are anonymous and the survey will only be open until [date]. Participants completing the 10-minute survey will be provided a Creighton University branded flash drive. The survey and Notice of Informed Consent are accessible from [URL].

The study is examining variables associated with students' feelings of community in online and on-ground courses. As a student enrolled in the Doctor of Occupational Therapy of the Doctor of Pharmacy program your viewpoint is very important to this study. There are no known risks, participation is entirely voluntary, and you are free to withdraw at any time.

After submitting the survey, a confirmation page will appear which can be redeemed for a Creighton University branded flash drive. Instructions for redeeming the confirmation page are provided on the page.

All survey responses are anonymous; no information is collected that allows me to connect the survey responses to an individual student.

If you have questions about the survey please contact me using the information in the email signature below.

Your perspectives on the sense of community will provide important insights and information. Your assistance with this research is very much appreciated.

Thank you very much!

Investigator:

Tracy A. Chapman, M.Ed.
Assistant Dean, Creighton Office of Online Learning
Executive Director for eLearning and Academic Technology, School of Pharmacy &
Health Professions Creighton University
Omaha, Nebraska 68178
Email: tchapman@creighton.edu
Phone: 402/280-3616
800-325-2830 (option#4)

Dissertation Advisor:

Dr. Allen Steckelberg, PhD
Department of Teaching, Learning and Teacher Education
University of Nebraska – Lincoln
asteckelberg1@unl.edu
(402) 472-5491

Second and Final Follow-up Email Invitation

I am writing to invite your participation in a dissertation research study examining classroom community. If you have already completed the survey, I thank you very much; please make sure you receive your Creighton University branded flash drive.

If you have not had a chance to complete the short 10-minute survey, please take a few moments to do so now [URL]. Survey responses are anonymous and the survey will only be open until [date]. Participants completing the 10-minute survey will be provided a Creighton University branded flash drive. The survey and Notice of Informed Consent are accessible from [URL].

The study is examining variables associated with student's sense of community in online and on-ground courses. As a student enrolled in the Doctor of Occupational Therapy of the Doctor of Pharmacy program your viewpoint is very important to this study. There are no known risks, participation is entirely voluntary, and you are free to withdraw at any time.

After submitting the survey, a confirmation page will appear which can be redeemed for a Creighton University branded flash drive. Instructions for redeeming the confirmation page are provided on the page.

All survey responses are anonymous; no information is collected that allows me to connect the survey responses to an individual student.

If you have questions about the survey please contact me using the information in the email signature below.

Your perspectives on the sense of community will provide important insights and information. Your assistance with this research is very much appreciated.

Thank you very much!

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APPENDIX D: LANDING PAGE AND NOTICE OF INFORMED CONSENT

Upon clicking on the link in the email invitation, students will be presented with the landing page as it appears below. This page includes the Notice of Informed Consent.

Thank you for following the link to access the survey! Should you decide to participate, click on the “Yes, I wish to participate” button appearing at the end of the Notice of Informed Consent. If you do not wish to participate, simply click on the “No thanks” button. All survey responses are anonymous. The survey will take approximately 10 minutes and must be completed in a single sitting. Upon completion of the survey you will be presented with a Confirmation Page containing information for receiving your Creighton University branded flash drive.

Notice of Informed Consent

University of Nebraska – Lincoln IRB# 20120212217EX

Creighton University IRB# 11-16260

Research Project Title: Variables Associated with Sense of Community in Online and On-Ground Clinical Doctorate Education

Purpose of the Research:

The purpose of this study is to identify student characteristics and course characteristics related to sense of community in clinical doctorate courses in which students are taking a full-time course load. The study is designed to answer the question, ‘What student characteristic variables and course characteristic variables are associated with sense of community within the context of courses contained in a doctor of occupational therapy and a doctor of pharmacy program?’ The study is being undertaken by the investigator as her dissertation research study which is one of the requirements for her PhD program at the University of Nebraska, Lincoln. You must be at least 19 to participate in the survey.

Procedures:

Participation in this study involves completion of a 27-item survey. The first 20 items are formatted to use Likert Scale responses. The responses range from Strongly Agree to Strongly Disagree. These 20 items ask participants to rate their feelings about a particular course, the degree to which participants feel other students and the instructor are supportive and interested in helping students succeed in the course. The remaining seven survey items are designed to collect demographic information such as the pathway in

which the participant is enrolled, the participant's year in the program of study, average number of hours the participants works, estimated current grade in the course, level of difficulty of the course, participant's age and gender. The survey will take approximately 10 minutes of your time, participation is voluntary and is not considered part of the requirements of either the Doctor of Occupational Therapy or the Doctor of Pharmacy program. You may choose not to respond to individual survey items. To access the survey click on the, 'Yes, I wish to participate' button appearing at the end of the Notice of Informed Consent. If you do not wish to participate, simply click on the "No thanks" button.

After submitting a completed survey, a confirmation page will appear that which can be redeemed for a Creighton University branded flash drive. Instructions for redeeming the confirmation page are provided on the page.

All survey responses are anonymous; no information is collected that allows me to connect the survey responses to an individual student.

Risks and/or Discomforts:

No known risks are expected, however, there is the chance that you may feel uncomfortable answering certain questions and you are free to withdraw at any time.

Benefits:

No known direct benefits to students exist. However, gaining a better understanding of the variables that impact community among students will provide instructors and administrators important information regarding how feelings of community are formed and could be increased. All students in the Doctor of Pharmacy and Doctor of Occupational Therapy programs will be notified when the study results are available and will have an opportunity to obtain a copy of the results.

Confidentiality:

The survey tool (BlueQ) to be used to deliver the survey will not collect any information which would allow the investigator to connect responses to a specific participant. Internet Protocol (IP) addresses of respondents will not be collected, nor any other electronic data that can track responses to a specific participant.

Opportunity to Ask Questions:

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. You may contact the investigator

Monday-Friday 8:00-4:30 CT at 800-325-2830 or 402-280-3616 or anytime via email at tchapman@creighton.edu. Additionally, please contact the investigator if you want to voice concerns or complaints about the research.

Please contact the University of Nebraska Institutional Review Board at (402) 472-6965 if you:

- wish to talk to someone other than the research staff to obtain answers to questions about your rights as a research participant
- wish to voice concerns or complaints about the research
- wish to provide input concerning the research process
- are unable to reach the study investigator

Freedom to Withdraw:

Participation in this study is voluntary. You can refuse to participate or withdraw at any time without harming your relationship with the investigators, Creighton University, or the School of Pharmacy and Health Professions, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy:

You are voluntarily making a decision whether or not to participate in this research study. You may print or save a copy of this consent form to your computer. To print a copy select 'Print' from the File menu in your browser screen. To save a copy select 'Save As' from the File menu in your browser screen.

The survey must be completed in a single sitting. Once started, if you are unable to complete the survey simply close the browser window. You may still participate at a later time by clicking on the link in the email invitation or contacting the study investigator.

Investigator:

Tracy A. Chapman, M.Ed.

Assistant Dean, Creighton Office of Online Learning

Executive Director for eLearning and Academic Technology, School of Pharmacy & Health Professions Creighton University

Omaha, Nebraska 68178

Email: tchapman@creighton.edu

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Dissertation Advisor:

Dr. Allen Steckelberg, PhD

Department of Teaching, Learning and Teacher Education

University of Nebraska – Lincoln

asteckelberg1@unl.edu

(402) 472-5491

[Yes, I wish to participate in the survey] [No, thanks, I do not wish to participate]

APPENDIX E: RESPONSE PAGE FOR NON-PARTICIPANTS

The response page presented to students selecting the ‘No thanks’ button appearing at the end of the Notice of Informed Consent will contain the following information.

Thank you for taking the time to consider participation in the Classroom Community survey. At this time you have chosen not to participate. In the event you change your mind and wish to participate please use the link in the email invitation or contact the study investigator.

Tracy A. Chapman, M.Ed.

Assistant Dean, Creighton Office of Online Learning

Executive Director for eLearning and Academic Technology, School of Pharmacy & Health Professions Creighton University

Omaha, Nebraska 68178

Email: tchapman@creighton.edu

Phone: 402/280-3616

800-325-2830 (option#4)

APPENDIX F: CONFIRMATION PAGE

The following confirmation page will appear upon submission of the survey. All fields on the survey are required; therefore a confirmation page will only be presented to participants submitting a completed survey.

Thank you for participating in the Classroom Community Scale survey! Please encourage your student colleagues to participate! I need their help!

Students in the first three years of the Doctor of Pharmacy and the Doctor of Occupational Therapy programs will be notified when the study results are available.

To receive your Creighton University branded flash drive either save this page to your computer or print this page. To print a copy select 'Print' from the File menu in your browser screen. To save a copy select 'Save As' from the File menu in your browser screen.

Campus students: Bring a copy of this page to the OLAT Help Desk in Criss 155 or BIC G10 to be exchanged for a flash drive.

Distance students: Either attach a copy of this page to an email message **containing your mailing address** to tchapman@creighton.edu or write your mailing address on a printed copy of this page and mail it to:

Tracy Chapman
Criss 155
School of Pharmacy and Health Professions
Creighton University
2500 California Plaza
Omaha, NE 68178

Your flash drive will be mailed to you via US mail.

Again, thank you so much for your participation!

APPENDIX G: CREIGHTON UNIVERSITY INSTITUTIONAL REVIEW BOARD NOTICE

Creighton
UNIVERSITY

Social Behavioral • Institutional Review Board
2500 California Plaza • Omaha, Nebraska 68178
phone: 402.280.2128 • fax: 402.280.4766
<http://www.creighton.edu/researchcompliance/IRB>

October 20, 2011

Tracy A. Chapman, M.Ed.
School of Pharmacy & Health Professions
Department of Online Learning

RE: 11-16260
IRB #: Variables Associated with Sense of Community in Online and On-Ground
TITLE: Clinical Doctorate Education

Dear Dr. Chapman,

Thank you for submitting the above mentioned proposal to the Institutional Review Board office for review. This project is exempt from Federal Policy for Protection of Human Subjects, as per 45CFR46.101 (b) 1. Accordingly, HHS Form 310 certifying this IRB review, exemption, and approval is enclosed. This IRB action is for a 3 year period. The following documents were received, reviewed, and approved:

1. The Study Protocol
2. The Information Letter
3. The Classroom Community Scale
- 4.

Continued approval is conditional upon your compliance with the following requirements:

1. Compliance with the Creighton University IRB policies and procedures
2. This project includes the use of an anonymous survey tool. When setting up the survey, be sure to disable the IP address so the survey remains totally anonymous.
3. Problems must be reported using the Reporting Form for Reportable New Information. Problems requiring report can be found in the IRB Policy 134 "Reportable New Information"
4. All protocol amendments and changes to approved research must be submitted to the IRB and not be implemented until approved by the IRB, except where necessary to eliminate apparent immediate hazards to the study subjects. Please use the modification form when submitting changes to protocol or consent documents.
5. This study cannot continue after the expiration date, which is October 19, 2014. You are required to submit a renewal/termination prior to this date. If you wish to continue the project, the renewal must be in the IRB office on week prior to the expiration date.

Amy Badura Brack, Ph.D.
Chair

Patsy Nowatke, RN, MHA
IRB Director

IRB# 11-16260

Page 2 of 2

October 20, 2011

If you should have questions during the course of this project, please call the IRB office at (402) 280-2126 and one of the administrators will assist you, or you may email the office at irb@creighton.edu.

Sincerely,

A handwritten signature in black ink, appearing to read 'Amy Brack', with a stylized flourish at the end.

Amy Badura Brack, Ph.D.
Chair, Institutional Review Board

Protection of Human Subjects Assurance Identification/IRB Certification/Declaration of Exemption (Common Rule)

Policy: Research activities involving human subjects may not be conducted or supported by the Departments and Agencies adopting the Common Rule (56FR28003, June 18, 1991) unless the activities are exempt from or approved in accordance with the Common Rule. See section 101(b) of the Common Rule for exemptions. Institutions submitting applications or proposals for support must submit certification of appropriate Institutional Review Board (IRB) review and approval to the Department of Agency in accordance with the Common Rule.

1. Request Type <input type="checkbox"/> ORIGINAL <input type="checkbox"/> CONTINUATION <input checked="" type="checkbox"/> EXEMPTION	2. Type of Mechanism <input type="checkbox"/> GRANT <input type="checkbox"/> CONTRACT <input type="checkbox"/> FELLOWSHIP <input type="checkbox"/> COOPERATIVE AGREEMENT <input type="checkbox"/> OTHER:	3. Name of Federal Department or Agency and, if known, Application or Proposal Identification No. IRB #: 11-16260
4. Title of Application or Activity VARIABLES ASSOCIATED WITH SENSE OF COMMUNITY IN ONLINE AND ON- GROUND CLINICAL DOCTORATE EDUCATION		
5. Name of Principal Investigator, Program Director, Fellow, or Other Tracy Chapman, M.Ed.		

6. Assurance Status of this Project (Respond to one of the following)

☐ This Assurance, on file with Department of Health and Human Services, covers this activity:
Assurance No. FWA00001028, the expiration date May 13, 2013. IRB Registration/Identification No. IRB00000155. (If applicable)
IRB Registration Numbers: IRB #1 Biomedical IRB # IRB00000155, (Expiration Sept. 14, 2012); IRB #2 Social Behavioral IRB # TIRB20067, (Expiration Sept. 14, 2012)

☐ This Assurance, on file with FDA covers this activity.

☐ No assurance has been filed for this institution. This institution declares that it will provide an Assurance and Certification of IRB review and approval upon request.

☒ Exemption Status: Human subjects are involved, but this activity qualifies for exemption under Section 101(b), paragraph 1.


7. Certification of IRB Review (Respond to one of the following if you have an Assurance on file)

☐ This activity has been reviewed and approved by the IRB in accordance with the Common Rule and any other governing regulations.
By: ☐ Full IRB Review on (date of IRB meeting) _____ or ☐ Expedited Review on (date) _____

☐ This activity contains multiple projects and has been reviewed and approved before they are initiated and that appropriate further certification will be submitted.

8. Comments

9. The official signing below certifies that the information provided above is correct and that, as required, future reviews will be performed until study closure and certification will be provided.	10. Name and Address of Institution Creighton University Research Compliance 2500 California Plaza Omaha, NE 68178
11. Phone No. (with area code) 402-280-3586	
12. Fax No. (with area code) 402-280-4766	
13. Email: irb@creighton.edu	
14. Name of Official Amy Badura Brack, Ph.D.	15. Title Chair, Institutional Review Board

16. Signature 	17. Date 10-21-11
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Sponsored by HHS

Public reporting burden for this collection of information is estimated to average less than an hour per response. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to OS Reports Clearance Officer, Room 5015, 200 Independence Avenue, SW., Washington, DC 20501. Do not return the completed form to this address.

APPENDIX H: UNIVERSITY OF NEBRASKA – LINCOLN INSTITUTIONAL
REVIEW BOARD NOTICE

<https://nugrant.unl.edu/nugrant/orr/irb/viewPrintedMessage.php?ID=131313>



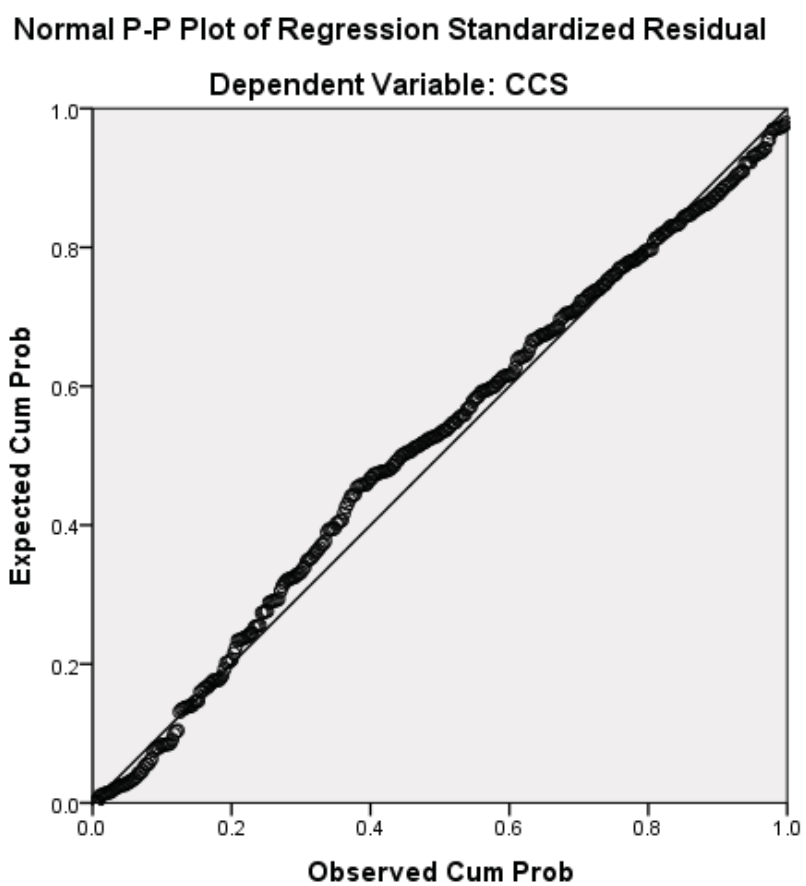
February 14, 2012 Tracy Chapman Graduate Studies 21330 Edgevale Pl Elkhorn, NE 68022 Allen Steckelberg Teaching, Learning and Teacher Education 59 HENZ, UNL, 68588-0355 IRB Number: 20120212217EX Project ID: 12217 Project Title: Variables Associated with Sense of Community in Online and On-Ground Clinical Doctorate Education Dear Tracy: This letter is to officially notify you of the approval of your project by the Institutional Review Board (IRB) for the Protection of Human Subjects. It is the Board's opinion that you have provided adequate safeguards for the rights and welfare of the participants in this study based on the information provided. Your proposal is in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as exempt, category 1. We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event: * Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures; * Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur; * Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research; * Any breach in confidentiality or compromise in data privacy related to the subject or others; or * Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff. This project should be conducted in full accordance with all applicable sections of the IRB Guidelines and you should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project. You should report any unanticipated problems involving risks to the participants or others to the Board. If you have any questions, please contact the IRB office at 472-6965. Sincerely,

Becky R. Freeman

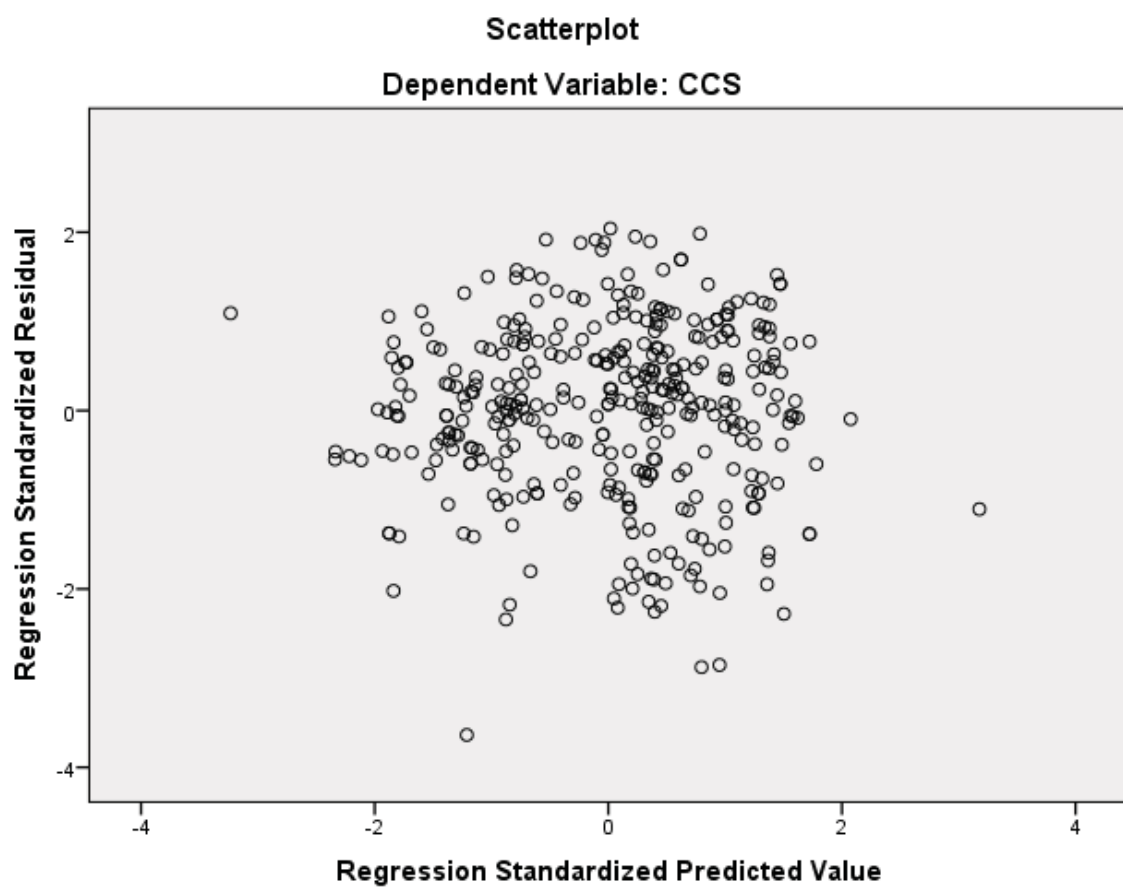
Becky R. Freeman, CIP for the IRB



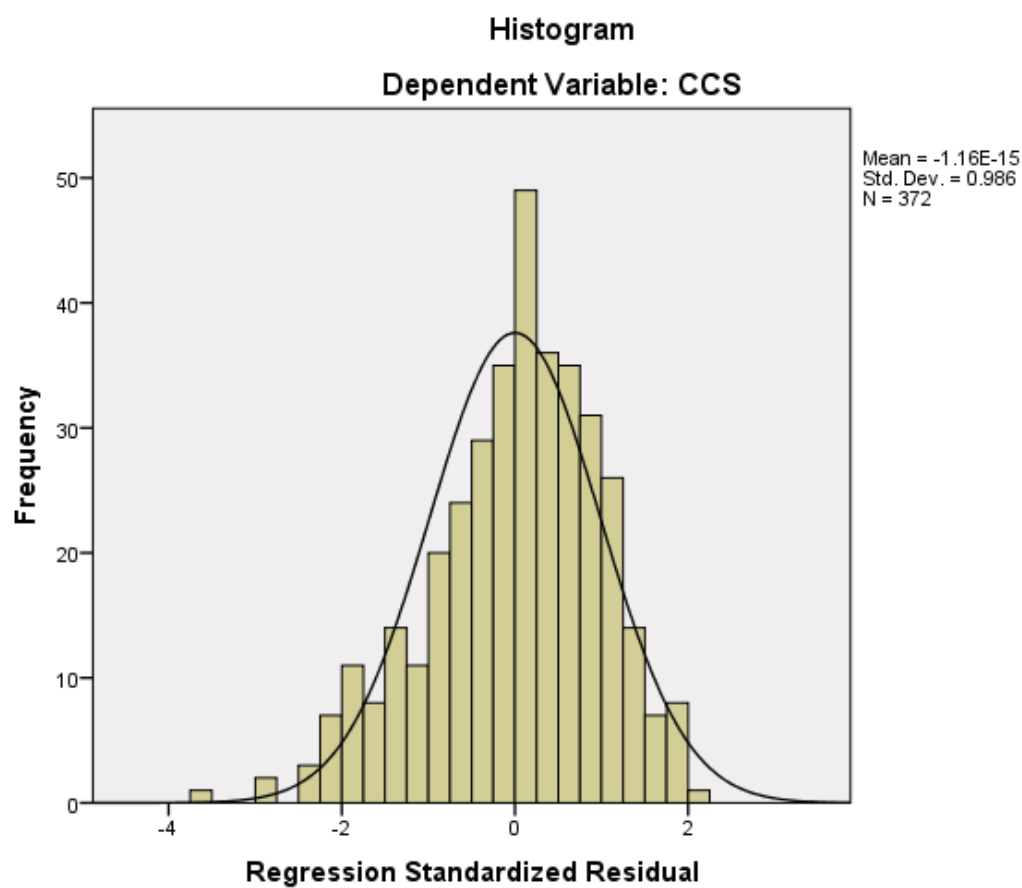
APPENDIX I: MULTIPLE REGRESSION ASSUMPTION TESTING FOR LINEAR
RELATIONSHIP



APPENDIX J: MULTIPLE REGRESSION ASSUMPTION TESTING FOR
CONSISTENCY OF THE ERROR VARIANCE



APPENDIX K: MULTIPLE REGRESSION ASSUMPTION TESTING FOR NORMAL
DISTRIBUTION OF THE RESIDUALS



APPENDIX L: MULTIPLE REGRESSION ASSUMPTION TESTING FOR MULTICOLLINEARITY

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	3.838	.165		23.331	.000		
small_group	.067	.034	.108	1.943	.053	.830	1.204
outcome_type	-.279	.062	-.226	-4.463	.000	.996	1.004
course_diff	-.016	.053	-.017	-.302	.763	.831	1.204
2 (Constant)	3.094	.379		8.154	.000		
small_group	.127	.035	.205	3.671	.000	.749	1.335
outcome_type	-.364	.077	-.295	-4.697	.000	.593	1.686
course_diff	-.038	.052	-.040	-.725	.469	.786	1.273
camp_v_dist	.323	.080	.260	4.018	.000	.558	1.793
year_in_prog	-.141	.047	-.191	-3.010	.003	.582	1.719
hours_worked	-.003	.003	-.042	-.819	.413	.893	1.120
estim_grade	.204	.051	.217	3.975	.000	.785	1.274
gender	.116	.066	.089	1.766	.078	.910	1.099
age	-.014	.006	-.147	-2.271	.024	.555	1.802

a. Dependent Variable: CCS

APPENDIX M: MULTIPLE REGRESSION ASSUMPTION TESTING FOR OUTLYING DATA POINTS

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.6929	4.2150	3.4608	.23743	372
Std. Predicted Value	-3.234	3.177	.000	1.000	372
Standard Error of Predicted Value	.055	.396	.091	.030	372
Adjusted Predicted Value	2.6498	4.3782	3.4615	.24476	372
Residual	-2.02308	1.13519	.00000	.54865	372
Std. Residual	-3.637	2.041	.000	.986	372
Stud. Residual	-3.695	2.059	-.001	1.004	372
Deleted Residual	-2.08740	1.22817	-.00076	.57051	372
Stud. Deleted Residual	-3.761	2.068	-.001	1.007	372
Mahal. Distance	2.680	187.386	9.973	13.872	372
Cook's Distance	.000	.225	.004	.017	372
Centered Leverage Value	.007	.505	.027	.037	372

a. Dependent Variable: CCS