Examining Sense of Community among Medical Professionals in an Online Program

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Abstract

As the number of online degree programs continues to grow, one of the greatest challenges is developing a sense of community among learners who do not convene at the same time and place. This study examined the sense of community among medical professionals in an online graduate program for healthcare professionals. We took the sample from a fully online program delivered jointly by a state university and a local children's hospital in the Midwest. We administered Rovai's Classroom Community Survey with 11 additional demographic questions. We also utilized online interviews to further explore students' understanding of sense of community. A bi-factor model was fitted to the online sense of community survey data. Using multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA) we identified potential group differences. The qualitative data were analyzed thematically in a recursive and iterative process. Study results suggested that a dominant factor existed: sense of community with two sub-domain factors including sense of learning and sense of connectedness. No significant differences in sense of community with regard to gender, native language, or area of medical practice were detected. However, results showed a difference in sense of community between the three courses examined. This study is the first to examine the sense of community among online medical professionals. Since our findings are in contrast to those of previous

studies, this opens the door to additional studies around the possible differences between the community characteristics and needs of medical professionals as online students.

Keywords: Learning community, sense of community, building learning community, online education, medical professionals

INTRODUCTION

The number of online courses and degree programs offered by accredited institutions continues to grow as students find the convenience of such programs permits furthering their education despite work and family obligations that prevent participation in face-to-face programs. One of the greatest challenges of teaching in online programs is developing and maintaining a sense of community with learners who do not gather for classes at the same time and place on a regular basis.

Building a sense of community and establishing connectivity in an online environment is crucial for learners to develop and nurture the relationship with each other that help produce better interaction, satisfaction and successful achievement of learning outcomes (Brindley, Walti, & Blaschke, 2009; McInnerney & Roberts, 2004; Overbaugh & Nickel, 2010; Vora & Kinney, 2014). Further, adopting community-centered pedagogy as a strategy in online courses influences knowledge building and collaboration within groups or among peers, involving continuous discussion of the point of views expressed, sharing ideas, resolving ways of thinking, and having consensus.

The notion of community-centered practices dates back to Dewey's pedagogy of community-centered learning (Simpson & Jackson, 1997; Swan, Garrison & Richardson, 2009). While many scholars have offered different terms to describe the community notion from a range

of perspectives, the evolution of Internet and Web technologies has created more innovative concepts of building learning communities because of the way individuals communicate as well as facilitate the creation, refinement, sharing and use of knowledge. In this sense, a community is a group of people who are socially interconnected, interact with each other to share certain practices, and participate together in discussion, problem-solving and decision-making (Bellah et al., 1985; Rovai, 2002; Swan, 2002; Swan, Garrison & Richardson, 2009). Along the same line, Wenger et al. (2002) also state that "a community of practice is not just a Web site, a database, or a collection of best practices. It is a group of people who interact, learn together, build relationships, and in the process develop a sense of belonging and mutual commitment" (p. 34).

When we speak of online community, we refer to people who have come together virtually (e.g., synchronous and/or asynchronous) to learn from and engage with one another in a social network of relationships. However, building a learning community and maintaining peer relationships can be challenging in an online environment because of a variety of factors related to learners (e.g., gender, language, culture, interaction and communication styles), teaching methods, technology, and physical distance (Drouin &Vartanian, 2010; Swan, 2002). Further, since online discussion is mainly text-based communication, reduced social and visual cues can be a concern or it may be a source of feeling of isolation and disconnectedness that may lead to decreased sense of community (Gerlock & McBride, 2013). Synchronous elements such as Skype, Blackboard Collaborate ^{TM} (Wimba Classroom and Elluminate Live!), and instant messaging system can be interjected into courses to facilitate greater participation and prevent isolation. However, due to schedule issues (finding the right time that works for everyone) or the instructors' comfort zone with technology can be a challenge or a barrier in some cases. In a study of communities of practice for healthcare students, Moule (2004) found the delay in

interaction within asynchronous courses to be problematic for group work and quick decision-making. During group collaboration, learners read each other's messages first and then they respond to the group members. When learners need to communicate with other students, there may be time delay because one may not be present at that time or may not have read the messages yet. From the learners' perspectives, this time delay may occur if there are different opinions and explanations among groups (it takes time to get consensus from everyone in the group), or while reading others' posting there may be a problem understanding their point of view and/or a lot of time is spent on crafting their answers.

In context of community building, Rovai and Baker (2005) investigated the gender differences in online learning. They reported that women tend to develop a stronger sense of community in online classes than men. Women enroll in online courses at a higher rate than men and they classify their experiences as "socially richer" and "educationally more effective" than men (Rovai & Baker, 2005, p. 40). One study reported that the majority of female university students had a very positive experience in their online courses (Sullivan, 2001). In another study of male post-graduate medical students used more formal and lengthier messages in online discussions compared to those of their counterparts (Taplin & Jegede, 2001). Gender differences in self-regulated learning (motivational beliefs and achievement in self-regulated online learning) were studied by Yukselturk and Bulut (2009), but their study did not show statistical differences. However, data from prior studies showed that there were some gender differences in online communication style of participation in online learning environments (e.g., male students attempt to control the online environment and female students tend to use more empathy) (Blum, 1999; Eastmond, 1995). These findings raise awareness of differences between genders regarding the community aspect of learning.

As mentioned above, studies related to gender differences, similarities, and establishing sense of community are present in the educational literature (Overbaugh & Nickel, 2010; Palloff & Pratt, 2007; Price, 2006; Rovai, 2002, Swan, 2002; Vora & Kinney, 2014; Yukselturk & Bulut, 2009), but studies related to the impact of gender differences, language, or different courses in building learning communities is vague and inconsistent. The purpose of this study was to examine the sense of community among medical professionals in an online graduate program for healthcare professionals. Around this focus, the following questions guided the study:

1. What is the latent structure of the sense of community scale for the medical professional students?
2. What is the relationship between students' gender and their sense of community?
3. What is the relationship between students' area of practice and their sense of community?
4. What is the relationship between students' native language and their sense of community?
5. What is the relationship between different courses and students' sense of community?

Theoretical Framework

The foundational theory for sense of community or psychological sense of community can be traced back to Sarason (1974), but the concept was further developed by McMillan and Chavis (1986). They proposed a multidimensional model described as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis, 1986, p. 9). Their definition offered a four-factor model: 1) membership, 2) influence, 3) integration and fulfillment of needs, and 4) shared emotional connection. The contributions of

Sarason, McMillan, Chavis and others were empirically assessed and criticized, but from those conceptual models several measures have been derived such as the Sense of Community Index, which has been widely used in social sciences and many other disciplines. Adapting ideas from these earlier work, Rovai (2002a) took the community concept and expanded the framework of sense of classroom community that comprised of four dimensions: 1) spirit (sense of being connected to the group), 2) trust (students rely on one another and feel safe with each other), 3) interaction (the pattern of exchange and communication among other learners and the instructor), and 4) commonality of expectations and goals (commitment to a common educational purpose).

The theoretical construct of our study involves in the concept of building sense of community online with gender differences in social collaborative learning. Rovia's connectedness and learning dimensions of online sense of classroom community constituted the basis for our study. There may be many paths or factors for the prediction of sense of community and student achievement in online environment (Yukselturk & Bulut, 2009). However, the literature is still inconclusive regarding the effects of gender differences upon the performance, communication behaviors, patterns of interaction, and socialization displayed in online courses. Our learning is socially constructed (Vygotsky, 1978) and we learn in groups or communities. Relationship is developed by the individual through interaction online (Rovai, 2004); that is, people come together to problem-solve, discuss, and validate learning. Social interactions with others enhance the learning process.

METHODS

This study utilized survey procedures and online asynchronous interview methods to gather data regarding sense of community among medical professionals in an online

environment. We obtained IRB approval from the Cincinnati Children's Hospital Medical Center.

Setting and Participants

The setting for this study was a fully online program delivered jointly by a state university and a local children's hospital in the Midwest. The program provides medical professionals with opportunities to enhance their teaching skills through the acquisition of knowledge related to pedagogy and educational research (Lewis & Baker, 2005). This online Master's Degree in Education Program for Healthcare Professionals is the only fully online program offered in the English-speaking world (Cohen, Murnaghan, Collins, & Pratt, 2005). We decided to use a convenience sample of students enrolled in three online courses between 2008 and 2009 terms. The following three courses in the master's program were examined in this study:

1. *Adult Learning in the Health Professions.* This course explored adult learning theories and how these principles could be applied to teaching within medical education.
2. *Masters Research Seminar.* This course exposed students to research concepts and methodologies in educational research and their application in educational practice. Students were expected to complete a master's project proposal during this course.
3. *Application of Technology in the Classroom (Two Sections).* This course focused on web-based and other technologies to enhance medical education, including the creation of e-portfolios, e-learning courses, and media-enhanced presentations. The course also evaluated instructional design and learning theories related to use of technology in education.

The three courses mentioned above were delivered using Blackboard, a web-based course management system. Course activities included presentations, readings, discussions, hands-on exercises, and real-time activities. All course materials were presented online in both asynchronous and synchronous formats.

Total program enrollment at the time of this study was 75 full-time, working medical professionals from various States (Average enrolment for per course was about 19 students). Their medical specialties and sub-specialties were varied. The majority of students in the program were taking only one course per quarter.

Instrument

This study used Rovai's (2002) Classroom Community Scale (CCS) and online interviews to obtain additional insight into the gender aspect of sense of community. We selected the CCS tool since it was developed specifically for the online environment and is sensitive to differences in sense of community within higher education students. As we mentioned in the theoretical framework section, this tool defined the community concept through four dimensions (spirit, trust, interaction, and common expectations).

The CCS is a 20-item questionnaire that uses a five-point Likert-type scale of response options ranging from Strongly Agree to Strongly Disagree (see Appendix). The survey has two subscales of ten questions each that measure a respondent's feeling of connectedness and perception of learning. Rovai (2002) reported the total CCS as reliable with a Cronbach's alpha of .93. The reported Cronbach's alpha for the connectedness subscale was .92 while the Cronbach's alpha for learning was .80, both indicating high reliability. In addition to the 20 questions on the CCS, we included 11 demographic survey questions to indicate age, gender, area of practice, language, and whether or not students had taken previous courses in the Online Master's of Education degree program.

As for the online interview, four qualitative, open-ended questions were designed to further explore students' understanding of sense of community and their perspectives on particular aspects of online community. These four questions were to assess: 1) understanding of online community (definition); 2) gender differences in online community development; 3) important elements of online community; and 4) perceived difference of online community interactions in the practice of medicine.

Data Collection

An email was sent to all 75 enrolled students asking their participation in a confidential online survey about their sense of community in their online program. The email included a brief explanation of the study and included a hyperlink to a web-based survey hosted on Survey Monkey®. Students who were enrolled in more than one course during the quarter received the email invitation only once. Likewise, based on the user data embedded in the hyperlink, students who were enrolled in multiple courses were permitted to take the survey only once. Students were asked to think of the same course as they responded to each survey item.

After we collected the survey results, we invited the students to participate in an online asynchronous interview comprised of four open-ended questions as described in the instrument section. Students received an email with a link to the questions posted on the SurveyMonkey platform. Responses were anonymous. We preferred this method because students were coming from various States and at the same time, the online method was convenient to accommodate everyone's schedule.

Data Analysis

Rovai's (2002) study used exploratory factor analysis (EFA) to investigate the factor structure of CCS and concluded that the CCS has two factors that measure a respondent's feeling

of connectedness and perception of learning, along with the sum score of all 20 items with classroom community as the common factor. From this description, the CCS is indeed a bi-factor structure measure (Gibbons et al., 2007), with the primary (dominant) factor being classroom community and two sub-factors being connectedness and perception of learning. Thus, we used the full-information bi-factor analysis to explore the latent factors for graded response data of CCS since this method has been considered credible for various types of data (Gibbons, 2007; Reise, 2007). Bi-factor models have several potential advantages when researchers are interested in the predictive relationships between domain specific factors. Moreover, by using the bi-factor model, both primary factor and domain specific factors can be compared across different groups given adequate level of measurement invariance. The BIFACTOR program developed by Gibbons in 2007 was used to explore the latent factor structure of the CCS.

Based on the results from the bi-factor model, we used analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) to explore the potential group differences such as gender, language, area of practice, and course groups. This part of analysis was completed in SPSS21.

We analyzed the qualitative data thematically in a recursive and iterative process (Corbin & Strauss, 2007). We identified key phrases and patterns in the free-text both in the content of sense of community and gender differences, including the important elements in building community. We also noted the examples given by the students regarding perceived differences in online community.

RESULTS

Profile of Respondents

Of the 60 survey respondents, 63.3% practiced pediatrics, and 18.3% practiced internal medicine. Female respondents made up 56.7% of the study population. The ages of respondents ranged from 21-60 years of age with 66.7% of respondents in the range of 31-40 years. Five of the respondents (91.7%) indicated that English is their native language. Table 1 outlines the demographic profiles of the students who responded to our survey.

Table 1. Student Demographics.

Characteristic	Category	Frequency	Percentage (%)
Gender	Female	34	56.7
	Male	26	43.3
Age	21-30 years	3	5.0
	31-40 years	40	66.7
	41-50 years	14	23.3
	51-60 years	3	5.0
Years of Work	1-5 years	6	10.0
	6-10 years	26	43.3
	10+ years	28	46.7
Position	Professor	23	38.3
	Resident/Fellow	13	21.7
	Other	24	40.0
Area of Practice	Pediatrics	38	63.3
	Internal Medicine	11	18.3
	Sub-specialties	11	18.3
Native Language	English - Yes	55	91.7
	English - No	5	8.3
Course Type	Research Seminar	19	31.7
	Adult Learning	14	23.3
	Technology	19	31.7
First Online Course	Yes	9	15.0
	No	51	85.0

Results from the Full-Information Bi-Factor Analysis

A full-information bi-factor model was first fitted to the data. Table 2 displays the primary factor loadings and sub-factor loadings from this bi-factor analysis. As indicated in

Table 2, all items had high loadings on the primary dimension (ranging from 0.55 to 0.99) suggesting that the scale was well designed and all items were related to the general construct of sense of community. The three most discriminate items were: a) item 11 "I trust others in this course" with a factor loading of 0.993; b) item 13 "I feel that I can rely on others in this course" with a factor loading of 0.994; and c) item 14 "I feel that other students do not help me learn" with a factor loading of 0.931 (this item was reverse coded for the analysis). In addition, items 11, 13, 14 and 17 were loaded heavily on the primary dimension but not on the two sub-domain factors, indicating that the primary dimension is a good measure for these items. The item intercepts or item threshold determine at what point the students would report the classroom community relative to other items. Table 2 shows that, in general, the sub-factor of connectedness was typically reported at lower levels than that of sub-factor of learning. However, item 9 and item 19, which loaded on sub-factor of connectedness, were located at same levels to the sub-factor of learning with intercept of 0.

Table 2. Item Intercepts and Factor Loadings of Classroom Community Scale.

Items	Intercepts	Primary Factor	Sub-factor	
		Classroom community	Connectedness	Learning
1	-1.060	0.779	0.627	
3	-1.302	0.851	0.428	
5	-1.501	0.883	0.182	
7	-2.368	0.766	0.465	
9	0	0.814	0.376	
11	-1.256	0.992	0.105	
13	-1.476	0.994	0.111	
15	-1.869	0.509	0.259	
17	-1.419	0.904	-.0.111	
19	0	0.855	0.274	
2	0	0.792		0.412
4	0	0.594		0.721
6	0	0.666		0.626
8	0	0.630		0.668
10	0	0.823		0.462
12	0	0.555		0.570

14	0	0.931	-0.361
16	0	0.811	0.493
18	0	0.831	0.441
20	0	0.894	0.281

Results from the Analysis of Variance

To explore potential group differences of the classroom community scale among online medical professionals, we computed the sum of all the items for the primary factor of classroom community, the sum of the items for the sub-domain factor of connectedness (item 17 was deleted from the analysis), and the sum of the items for the sub-domain factor of learning (item 14 was deleted from the analysis). Then, we further compared the means of these two-sub-factors across different groups.

The bivariate correlation between the variable of connectedness and learning is 0.615, which is a moderate correlation between these two variables, while the correlations between the variables of classroom community and connectedness and learning are 0.910 and 0.877, respectively. Therefore, we used multivariate analysis of variance (MANOVA) to investigate the potential group differences on the learning and connectedness variables. However, we did not include the classroom community variable in the MANOVA model because the correlations between the variables of classroom community and connectedness and learning are relatively high, which may cause a multicollinearity problem if using MANOVA. The analysis of variance (ANOVA) was used to examine potential group differences on the classroom community variable.

A MANOVA was conducted to examine the effect of gender and specific course on sense of learning and connectedness (see Table 3). Results showed that gender was not a significant factor among students in our study, with Wilk's $\Lambda=0.84$. Interestingly, however, the effect of the

specific course taken was significantly different, with Wilk's $\Lambda = 0.04$. Further results from a test of between-subject effects indicate that there is a slight difference at the significance level of 0.1 on the sense of learning variable, $F(2, 46) = 2.63$, $p = 0.06$, partial $\eta^2 = .13$, indicating 13% of the variance was accounted for by the different courses students took. A post-hoc analysis showed that students perceived a higher level of learning in the Technology course than in the Adult Learning and Masters Research Seminar courses. The potential group differences of other variables including age, years of work, position, area of practice, native language, and online course experience, were also examined. However, no statistically significant differences were found for any of these variables.

Table 3. Results from Multivariate Analysis of Variance of Factors that May Contribute to Online Sense of Community

Source	Dependent Variable	Sum of Squares	Degree of Freedom	F	P
Courses	Connectedness	89.83	2	1.64	.21
	Learning	123.79	2	2.89	.06*
Gender	Connectedness	7.22	1	.26	.60
	Learning	0.14	1	.01	.92
Area of Practice	Connectedness	10.33	2	.19	.83
	Learning	53.71	2	1.26	.30
Age	Connectedness	102.50	3	1.25	.31
	Learning	21.81	3	.34	.80
Year of Work	Connectedness	10.47	2	.19	.83
	Learning	16.25	2	.38	.69
Native Language	Connectedness	8.81	1	.32	.57
	Learning	4.34	1	.20	.66
Total	Connectedness	22690	52		

	Learning	17453	52

Note. *p = 0.1

ANOVA was used to examine the potential group differences of classroom community as the dominant variable (see Table 4). Similarly, sense of community among each course showed a trend towards significance. Post-hoc analysis indicated that students had a higher level of classroom community in the Technology class (*M* = 45.73, *SD* = 8.27), compared to the Adult Learning course (*M* = 37.35, *SD* = 7.85) and the Masters Research Seminar course (*M* = 42.00, *SD* = 10.92). Results also did not show evidence of difference in classroom community by other variables including gender, age, years of work, position, area of practice, native language, and online course experience.

Table 4. Results from Analysis of Variance among Three Different Courses Using Classroom Community as the Dominant Factor

Source	Sum of Squares	Degree of Freedom	F	P
Between Groups	556.41	2	3.32	0.04**
Within Groups	4182.90	49		
Total	4749.31	51		

Note.** p = 0.05

Results from the Online Interviews

A total of 31 students completed the online interview component of the study. Most students did not see the gender differences in building online community as an important factor. As long as students communicate, participate and learn from each other, they did not care about the gender issues. However, a few students noted that gender differences depend on the situation

and the course they are taking. They also emphasized that a mix of male and female participants enriches discussion and sets the tone from both perspectives.

Students' definitions of online community highlighted some of the essential ingredients of community building such as collaboration, group communication, mutual give-and-take, sharing of thoughts and ideas, networking, shared interests and goals, and helping one another. One of the students, as excerpted below, added the perspective of the contribution from the instructor.

> "*A community where we learn from each other and help each other think in new ways. Seeing new perspectives from our peers, but also learning from the professor (the education expert) are valuable. An absentee professor is not helpful, no matter how great the peer group is.*"

A majority of students frequently identified the most important elements of building online community as:

- Sharing of experiences, opinions, views and knowledge
- Having similar interests and goals (e.g. providing visual elements such as photos of family and hobbies during the first week of introduction)
- Having support in the form of helping, guiding, teaching, and listening to each other
- Availability of support, constructive feedback both from the peers and instructor, effective communication, and up-to-date feedback
- Instructor visibility and participation in the discussion forums
- Communicating effectively and interacting with different individuals
- Showing polite and friendly attitudes, including being respectful for differences of opinion

- Having manageable size of the community (too large groups are difficult to track.)

In addition, 16 out of 31 students did not perceive any discipline-specific differences. However, only a few students noted that medical practice differences might affect a sense of community, as students in the same area of practice may connect more and share similar ideas.

DISCUSSION

Our study investigated the sense of community among medical professionals who enrolled in an online graduate program. The findings both from the Classroom Community Survey (CCS) and qualitative data showed that gender difference was not a significant factor in building learning community However, the results from the full information bi-factor analysis (the latent factor structure of the CCS) confirmed that there was a dominant factor regarding sense of community with two sub-domains: respondents' feeling of connectedness and perception of learning. On the other hand, several students stressed the importance of the instructors' participation and presence in the successful development of sense of community in an online environment, which is an area that the CCS did not specifically address. Multiple studies also support the importance of online instructor participation in fostering a sense of community (Kanuka & Garrison, 2004; Ladyshewsky, 2013; Mandernach et al., 2006). Further, courses that embed the requirements for peer-to-peer interaction, frequent feedback, and instructor-to-student communication are perceived to have a greater sense of community.

Influence of Gender in Online Learning

Studies addressed that gender differences within the class may influence emotions, attitudes, participation, study preferences or habits, motivation, performances, perceptions, and communication behaviors in an online learning environment (Anderson & Haddad, 2005; Eastmond 1995; Rovai & Baker, 2005; Sullivan, 2001; Swan, 2002; Taplin & Jegede, 2001;

Yukselturk & Bulut, 2009). Our study may not be consistent with findings of other studies. However, our findings suggest that of the online environment may diminish gender differences by allowing for increased anonymity. Further, it is possible that a learning community was created in which students felt safe to freely communicate, thus eliminating potential gender differences. Speaking about it, early studies in computer-medicated communication claimed that online environment would minimize gender differences due to limited social cues (Kiesler, Siegel & McGuire, 1984; Sullivan, 1999; Wolfe, 2000). Mo et al. (2009) also argued that online communication mitigates gender differences typically seen in face-to-face communication.

Effects of Native Language on Building Sense of Community

Language is the medium by which we communicate and create experiences (Kramsch, 1998). The need to use a non-native language to communicate may hinder participation in learning and community-building processes. Without non-verbal cues in the online environment, language barriers can become even more problematic. Unfortunately, very few studies have explored the effect of language and culture in online courses. One study conducted by Wang (2004) addressed this issue by examining Asian students enrolled in synchronous online courses in the United States. Wang showed that language barriers were the biggest challenge for these students, including difficulty with understanding native speakers due to speaking speed or regional accents, fear of making language and grammatical errors, and difficulty understanding American idioms and stories related to American culture. Again, our study did not capture any language barriers, which is not consistent with the literature above. This may be due to the very small representative group (only five students) to affect the students' interaction with other students. Another reason would be: the nature of asynchronous teaching techniques may have

allowed our non-native students more time to think and write about their responses as proposed by Wang's study (2004).

Effects of Discipline Specific Differences on Building Sense of Community

Our study did not find any factors related to age or the areas of medical practices that might negatively affect building a sense of community in an online environment. While we did not find literature which specifically addressed the effects of specific discipline differences, we think this unity may be related to medical working ethics. Medical professionals are used to working with diverse groups of healthcare professionals (e.g., physicians, nurses, pharmacists, dieticians, and health educators, social service, and so on) and/or multidisciplinary teams with the common purpose of coming together to provide effective and efficient care to patients.

Not seeing any evidence dealing with discipline specific differences in building a sense of community made us think that online courses may be a good venue to teach learners how to best communicate among the various disciplines. In medical context, it is crucial for learners to learn from each other, construct knowledge, and uncover learners' beliefs and preferences in medical practices. At the same time, they learn how to work together in interdisciplinary or cross-disciplinary teams to improve quality of care in many perspectives (e.g., patient-centered, patient safety, efficiency, and equitable care).

Influence of Course Design and Instructors on Building Sense of Community

Although this was not the main scope of our study, a significant difference in the dominant classroom community variable was noted between the three courses that were examined in this study. The Application of Technology in the Classroom course was found to have the highest sense of community and sense of learning. While all three courses had some common characteristics such as the technology platform (Blackboard), instructor-led and utilized

discussion board activities, we did not investigate these variables. However, the literature shows that course type, course design, and instructor presence may influence sense of community and satisfaction with online learning (Palloff & Pratt, 2007; Mandernach, Gonzales & Garrett, 2006). Instructor factors may vary and include: level of involvement, facilitation style, social presence, student interactivity, feedback, and quality of teaching. Studies show that instructors who have a strong online social presence, provide meaningful feedback, interact with students, and have high quality teaching methods will positively influence students' satisfaction and course learning outcomes (Ladyshewsky, 2013; Young & Bruce, 2011). Baker (2010) also found a statistically significant positive relationship between instructor presence and student learning, cognition, and motivation. Consequently, course design and instructor factors need to be considered when evaluating sense of community.

Limitations of the Study

Like any research study, this study has some inherent limitations. First, this study used convenience sampling to identify participants. Samples of convenience threaten internal validity as a source of bias (Patten, 2005) because they do not produce a random sample for which every member of the population has an equal chance of being selected. Students in this study volunteered to complete the survey, which adds another level of bias to the sampling procedure. Volunteers may have a greater interest in the survey topic or a frustration to express through participation in the study. Second, the sample size for this study was small and was limited by the number of students enrolled in the program. A larger sample size may have allowed for more significant differences among the variables studied, as well as further validity of findings. Third, the number or the kind of the courses taken may be a confounding variable. That is, the experience of students in one of the courses may have affected their perceptions in other courses.

Lastly, although all three courses utilized discussion board activities, we did not look at the types of activities, contents of messages, or frequency of postings from male and females to each other.

CONCLUSION

In medical education, non-traditional teaching modalities and approaches are necessary to maximize learning, and accommodate learners' needs that include building cumulative knowledge in order to obtain new insights on various medical education related issues. There is no doubt that online learning is changing the nature of teaching and learning in medicine. To our knowledge, this study was the first to examine the sense of community in a graduate level online program for medical professionals. Although our study did not detect any statistical differences in a sense of community with regard to gender, native language, or area of practice, the other programs may benefit the theoretical framework applied in this study which may yield significant insights into the development of sense of community among learners from different disciplines.

The information gained in this study has implications for further investigation, looking into course design and instructional strategies that may influence sense of community. Moreover, a larger sample size may provide greater insight into the significance of variables that may impact sense of community and may allow for detection of significant factors that were not detected in this small study. In addition, discussion forum content analysis (level of participation and discussion forum interaction between two genders) and further student interviews should be conducted to examine the ways in which students communicate and facilitate the creation, refinement, sharing, and use of knowledge in their communities of practice.

REFERENCES

Anderson, D. M., & Haddad, C. J. (2005). Gender, voice, and learning in online course environments. *Journal of Asynchronous Learning Network, 9*(1), 3–14. Retrieved from http://sloanconsortium.org/jaln/v9n1/gender-voice-and-learning-online-course-environments

Baker, C. (2010). The impact of instructor immediacy and presence for online student affective learning, cognition, and motivation. *The Journal of Educators Online, 7,* 1-30. Retrieved from http://www.thejeo.com/Archives/Volume7Number1/BakerPaper.pdf

Bellah, R. N., Madsen, R., Sullivan, W.M., Swidler, A., & Tipton, S.M. (1985). *Habits of the heart: Individualism and commitment in American life*. New York, NY: Harper & Row.

Blum, K. D. (1999). Gender differences in asynchronous learning in higher education: Learning styles, participation barriers and communication patterns. *Journal of Asynchronous Learning Networks, 3*(1). Retrieved from http://sloanconsortium.org/jaln/v3n1/gender-differences-asynchronous-learning-higher-education

Brindley, J. E., Walti, C., & Blaschke, L. M. (2009). Creating effective collaborative learning groups in an online environment. *International Review of Research in Open and Distance Learning, 10*(3), 1–18.

Cohen, R. Murnaghan, L., Collins, J., & Pratt, D. (2005). An update on master's degrees in medical education. *Medical Teacher*, 27, 686-692.

Corbin, J., & Strauss, A. (2007). *Basics of qualitative research: Techniques and procedures for developing grounded theory.* (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Drouin, M., & Vartanian, L. R. (2010). Students' feelings of and desire for sense of community in face-to-face and online courses. *Quarterly Review of Distance Education, 11*(3), 147-159.

Eastmond, D. V. (1995). *Alone but together: Adult distance study through computer conferencing*. Creskill, NJ: Hampton Press, Inc. Gerlock, J. A., & McBride, D. L. (2013). Managing online discussion forums: Building community by avoiding the drama triangle. *College Teaching, 61*(1) 23-29.

Gibbons, R. D., Bock, R. D., Hedeker, D., Weiss, D., Segawa, E., Bhaumik, D., & Stover, A. (2007). Full-information item bifactor analysis of graded response data. *Applied Psychological Measurement, 31,* 4-19.

Kanuka, H., & Garrison, D. R. (2004). Cognitive presence in online learning. *Journal of Computing in Higher Education, 15,* 21-39.

Kiesler, S., Siegel, J., & McGuire, T. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist, 39,* 1123-1134.

Kramsch, C. (1998). *Language and culture.* Oxford, UK: Oxford University Press.

Ladyshewsky, R.K. (2013). Instructor presence in online courses and student satisfaction. http://academics.georgiasouthern.edu/ijsotl/v7n1/articles/PDFs/Acc%20Art_%20Ladyshewsky.pdf

Lewis, K.O., & Baker, R.C. (2005). Development and implementation of an online master's degree in education program for health care professionals. *Academic Medicine, 80,* 141-146.

Mandernach, B. J., Gonzales, R. M., & Garrett, A. L. (2006). An examination of online instructor presence via threaded discussion participation. *Journal of Online Learning and Teaching, 4,* 48-260. Retrieved from http://jolt.merlot.org/vol2no4/mandernach.htm

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.

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

Mo, P. K., Malik, S. H., & Coulson, N. S. (2009). Gender differences in computer-mediated communication: A systematic literature review of online health-related support groups. *Patient Education and Counseling*, *75*, 16-24.

Moule, P. (2004). E-learning for healthcare students: Developing the communities of practice framework. *Journal of Advanced Nursing*, *54*, 370-380.

Overbaugh, R. C., & Nickel, C. E. (2010). A comparison of student satisfaction and value of academic community between blended and online sections of a university-level educational foundations course. *The Internet and Higher Education, 14*(3), 164-174.

Palloff, R., & Pratt, K. (2007). *Building learning communities in cyberspace: Effective strategies for the online classroom*. San Francisco, CA: Jossey-Bass Inc.

Patten, M. (2005). *Understanding research methods* (5th ed.). Glendale, CA: Pyrczak Publishing.

Price, L. (2006). Gender differences and similarities in online courses: Challenging stereotypical views of women. *Journal of Computer Assisted Learning*, *22*(5), 349–359.

Rieck, S., & Crouch, L. (2007). Connectiveness and civility in online learning. *Nurse Education in Practice, 7*, 425-432.

Rovai, A.P. (2002). Building a sense of community at a distance. *International Review of Research in Open and Distance Learning, 3,* 1-6.

Rovai, A.P. (2002a). Development of an instrument to measure classroom community. *The Internet and Higher Education, 5*(3), 197-211.

Rovai, A. P. (2004). A constructivist approach to online college learning. *The Internet and Higher Education,* 7(2), 79–93.

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,* 31-44.

Sarason, S. B. (1974). *The psychological sense of community: Prospects for a community psychology*. San Francisco: Jossey-Bass, Inc., Publishers.

Simpson, D. J., & Jackson, M. J. B. (1997). *Educational Reform: A Deweyan Perspective*. New York, NY: Routledge.

Sullivan, P. (1999). Gender and the online classroom. *Teaching English in the Two-Year College, 26,* 361–371.

Sullivan, P. (2001). Gender differences and the online classroom: Male and female college students evaluate their experiences. *Community College Journal of Research & Practice, 25,* 805-818.

Swan, K. (2002). Building learning communities in online courses: The importance of interaction. *Education Communication and Information, 2*(1), 23–49.

Swan, K., Garrison, D. R., & Richardson, J. C. (2009). A constructivist approach to online learning: the Community of Inquiry framework. In Payne, C. R. (Ed.) *Information*

Technology and Constructivism in Higher Education: Progressive Learning Frameworks. Hershey, PA: IGI Global, 43-57.

Taplin, M., & Jegede, O. (2001). Gender differences in factors influencing achievements of distance education students. *Open Learning*, *16*, 33-154.

Vora, R. S., & Kinney, M. N. (2014). Connectedness, sense of community, and academic satisfaction in a novel community campus medical education model. *Academic Medicine*, *89*(1), 182-187.

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

Wang, C.M. (2004). Taking online courses in the United States: The perspectives of Asian students from China, Korea, Singapore, and Taiwan. In G. Richards (Ed.), Proceedings of *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* 2004. Chesapeake, VA: Association for the Advancement of Computing in Education.

Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating communities of practice*. Boston, MA: Harvard Business School Press.

Wolfe, J. (2000). Gender, ethnicity, and classroom discourse. *Written Communication*, *17*, 491–520.

Young, S., & Bruce, M. A. (2011). Classroom community and student engagement in online Courses. *Journal of Online Learning and Teaching*, *7*, 219-230. Retrieved from http://jolt.merlot.org/vol7no2/young_0611.htm

Yukselturk, E., & Bulut, S. (2009). Gender differences in self-regulated online learning environment. *Journal of Educational Technology & Society*, *12*(3), 12–22.

Appendix

CLASSROOM COMMUNITY SURVEY

We are conducting this study to better understand our students' feelings of community in online courses. The data we collect will be compiled for study purposes and will contain students' responses without reference to individuals. We assure that all your comments will remain confidential.

Part I –Classroom Community Survey (CCS)

Below you will see a series of statements concerning an online course you are presently taking. Read each statement carefully and select the option that best represents 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. Do not spend too much time on any one statement, but give the response that seems to describe how you initially feel. **Please respond to all items.**

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

Part II – Demographic Information

1. What is your age? ____ 20-30 years
____ 31-40 years
____ 41-50 years

____ 51-60 years
____ 61 or older

2. Your gender? ____ Female ____ Male

3. How many years have you been working in healthcare area?

- 1-5 years
- 6-10 years
- More than 10 years

4. What is your discipline?

4. What is your position?

- Full professor
- Associate professor
- Assistant professor
- Resident/Fellow
- Other

6. Is this your first online course in the UC Master's program?

- Yes
- No

7. What is your status?

- Full time
- Part time

8. Is English your primary language?

9. If not, what language do you speak?

PLEASE ANSWER THE FOLLOWING QUESTIONS IF ENGLISH IS YOUR SECOND LANGUAGE:

Please tell us how much you agree or disagree with each of the following statements

10. I feel that my language skills allow me to successfully contribute to class discussions.
Strongly Agree Agree Neutral Disagree Strongly Disagree

11. I am uneasy about my language skills when I interact with classmates online.
Strongly Agree Agree Neutral Disagree Strongly Disagree

12. I feel that English as a second language is a barrier in communication with my classmates and/or the instructors
Strongly Agree Agree Neutral Disagree Strongly Disagree

13. I feel that my overall learning in the masters program is threatened due to English being my second language?
Strongly Agree Agree Neutral Disagree Strongly Disagree

14. Do you have any other comments regarding English as a Second Language?

Thank you very much for giving us this opportunity. Your time is very much appreciated and your comments have been very helpful.