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CONTINUING EDUCATION

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Perceived Sense of Community, Cognitive Engagement, and Learning Outcomes Among Undergraduate Nursing Students Enrolled in an Internet-Based Learning Course

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Internet-based learning environments are a popular instructional delivery method that provides flexibility, easy access, convenience, and self-directed learning. There is concern that Internet-based learning creates a loss of community and lacks the power to fully engage the student, leading to negative learning outcomes. This descriptive, correlational study evaluated the relationship among a perceived sense of community, cognitive engagement, and learner outcomes among undergraduate nursing students enrolled in an Internet-based learning course. A convenience sample of 96 undergraduate nursing students enrolled in an online health informatics course participated in this study. Findings indicated a moderate sense of community and a positive relationship between student engagement and learning outcomes. A variety of group activities such as wikis, blogs, and discussion board were helpful in promoting a sense of community, but students emphasized a desire for more faculty feedback and interaction. Nursing is a collaborative profession where community building is a critical skill; therefore, innovative teaching/learning techniques that promote a sense of belonging and community are needed to improve learning outcomes, prepare students to provide quality patient care, and interact with an interprofessional team.

KEY WORDS

Cognitive engagement • Internet-based learning • Learning outcomes • Online community • Online learning

Internet-based learning (IBL) has been around since the introduction of the World Wide Web in the early 1990s and is an accepted approach for instructional delivery in postsecondary environments. According to Cook et al,[1(p1181)] "Internet-based education permits learners to participate at a time and place convenient to them, facilitates instructional methods that might be difficult in other formats, and has the potential to tailor instruction to individual learners' needs." Other scholars agree that this type of instruction provides more flexibility for students in terms of convenience, access, and learner control than traditional methods do.[2–4] Some scholars indicate that IBL can be used as a recruitment tool to attract and retain students without concern for geographic location.[2,4] Although many would agree that there are positive attributes to IBL, other researchers report that students who enroll in these courses often feel isolated, unfocused, and disconnected from their classmates along with difficulty in cultivating a community identity and developing online relationships.[5–7] In addition, the proliferation of advanced technology has created many concerns with online learning environments related to course design, instruction, and delivery methods.[6–8] Faculty has always struggled with creative ways to motivate or engage students in cognitive activities to achieve positive learning outcomes.[9,10] Traditional methods that work in a classroom do not always translate the same in an online environment. Instructors often do not know if a student is fully engaged or feels a sense of community with other students until it is too late. Some instructors may not have the time or computer skills to explore innovative approaches or may

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be reluctant to try the new technology because of lack of empirical evidence to support effectiveness. But despite these concerns, student recruitment often depends on the availability of alternative learning options to ensure higher levels of enrollment.

Nursing programs currently use a variety of teaching methods such as classroom lecture, group projects, simulated laboratory activities, and clinical rotations that enhance community building among students. Traditional courses allow for face-to-face interaction between students and faculty and between student and students, which creates a sense of community. There is more interaction as a group when you can see and talk to a person and share in common experiences. Courses that are offered online are often perceived as impersonal and lacking group support, which can lead to less satisfying results and poor learning outcomes. Rovai[11] indicated that a strong sense of community will increase the flow of information and support among students as well as improve learning outcomes. Internet-based courses are commonly conducted in an asynchronous format with no set time for interaction. The impersonal nature of this learning modality is thought to diminish community building and creates an environment in which it is more difficult to fully engage the student in cognitive activities. Healthcare professionals are particularly vulnerable to the negative aspects of online learning. Community building and collaboration among healthcare workers are critical when working toward a common goal of providing quality patient care or interacting with an interprofessional team.[12]

REVIEW OF LITERATURE

There is concern that IBL environments have created a loss of community and lack the power to fully engage the student in cognitive activities, which leads to negative learning outcomes. With the faculty shortage and the push to increase enrollment and retention of students, the evaluation of online methods to foster a sense of community and cognitive engagement is critical to student and programmatic success. Therefore, IBL in healthcare education, sense of community, and cognitive engagement were the concepts explored in the literature.

Internet-Based Learning in Healthcare

In healthcare education, IBL is a popular method of instruction. Studies abound on the benefits of this technology, similarity in outcomes between traditional and online modalities, and the positive response toward IBL in general.[1,13–16] Literature review findings related to IBL in nursing and medical education concluded that many of the studies in this area were based largely on attitudes and satisfaction toward the technology rather than specific design methods or outcomes.[14,17] Cook[18] proposed that new research should concentrate on specific teaching strategies within the same or similar IBL environments to determine the impact on learning outcomes. Other scholars point out that technology has significantly evolved and students are more computer literate than previous generations, so the focus must be on effective ways to incorporate new methodologies into education.[11,19,20] In this respect, Jones and Wolf[20(p44)] indicate that "Students desire teaching learning methods that appeal to their cyber senses." Although the use of IBL is more pervasive in nursing and medical education, there continues to be a lack of supportive evidence related to teaching strategies used in IBL environments that improve learning outcomes and enhance a sense of community and cognitive engagement.

Sense of Community

McMillan and Chavis[21(p9)] 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." Obura et al[22(p2)] defined a community of learners as "a group of people who share an interest for what they do and engage in collaborative learning that creates bonds between them." Rovai[23] proposed a similar definition for sense of community as a feeling of belonging to a group and identified the two essential components as connectedness and learning. For a student to feel "connectedness," there must be trust and cohesiveness within the group along with peer support and encouragement. A learning community refers to shared learning values and goals where the student can speak openly and ask questions, receive timely feedback, and feel that educational needs are met. Rovai's definition provided the most comprehensive view of community and was used in this study.

Research related to online community focused mostly on general education courses. Brown[24] conducted a qualitative grounded theory study to look at the process through which community is formed in adult online courses. Findings indicated that there are three stages of community development, which starts with making friends online, being accepted by others, and fellowship after long-term interaction and communication. This was supported by other researchers who found that groups who communicated more frequently had a greater sense of community.[5,12,25] Researchers[12,22,26] have conducted several studies with similar results and indicated that communication patterns differed between men and women, where women exhibited a stronger sense of community than men did. Other research related to online community in healthcare has been limited and primarily descriptive. Moule[27] conducted a study of 109 nursing and radiology students to assess whether they

were able to develop characteristics of communities while completing an online course. Trust was an issue, and not all students were committed to their groups. Obura et al[22] conducted a case study of 10 radiology residents in Nairobi, Kenya, and reported that community of learning behaviors were adopted by residents. Tilley et al,[28] in a descriptive cohort study of 45 registered nurse (RN) students in an online course, found that positive group dynamics that led to an effective learning community were supportiveness, open sharing of oneself, and socialization. Overall, communication, trust, mentoring, open sharing, and socialization were found to be important in creating a sense of community.

Cognitive Engagement

Corno and Mandinach[29] were the first to examine cognitive engagement as a critical component of student learning outcomes in the classroom. They defined cognitive engagement as "sustained, engaged attention to a task requiring mental effort." McLoughlin and Luca[9] contend that learning is enhanced when social and cognitive approaches are integrated. Learner outcomes are most often determined by final grades or test scores, but some scholars argue that these may not be reliable measures of cognition.[22,26] Many factors can affect learner outcomes, such as prior knowledge of course content, class participation, late work, or attendance, as well as inconsistent grading by instructors. Although the evaluation of cognitive engagement in traditional learning environments is well documented, few studies were found that focused on IBL. Saade and Bouchaib[10] evaluated the impact of cognitive absorption, perceived usefulness, and perceived ease of use in an online management course. Results indicated that acceptance of the online learning system and cognitive absorption was a significant influence on the variables within the model. Other studies reported that cognitive engagement can be accomplished in online environments through frequent communication and self-expression.[5,9,25,28] These studies highlight the importance of cognitive engagement in learner outcomes. No recent studies were found that evaluated cognitive engagement and learner outcomes of IBL courses in nursing.

Overall, findings indicate that IBL is a viable option for delivery of nursing and medical education, but research that evaluated a sense of community, cognitive engagement, or methods for community building online is lacking. Many scholars promote the idea that learning is enhanced when social and cognitive approaches are integrated,[1,6–8,20,23,30] but there is little empirical evidence to support this assertion, and even less in nursing education. Based on this review of literature, there is a need to explore the relationship among a perceived sense of community, cognitive engagement, and learning outcomes among nursing students.

PURPOSE

The specific aim of this project was to evaluate the relationship among a perceived sense of community, cognitive engagement, and learning outcomes among undergraduate nursing students enrolled in an Internet-based health informatics course. Three research questions were explored:

1. What is the relationship among a perceived sense of community, cognitive engagement, and learning outcomes among undergraduate nursing students enrolled in an Internet-based course?
2. Is there a difference between the fall and spring online course sections related to a perceived sense of community, cognitive engagement, and learning outcomes?
3. What teaching/learning activities promote a perceived sense of community?

METHODS

Study Design

This study was conducted at a large university school of nursing on the East Coast. All undergraduate nursing students are required to complete a healthcare informatics course to graduate. Five Internet-based sections of an introductory healthcare informatics course with an anticipated enrollment of 125 online students per semester were offered. A blended section in which students attended traditional face-to-face classroom instruction combined with Internet learning was conducted but not included in this study. The school of nursing uses the Blackboard Academic Suite (Blackboard Inc., Washington, DC) for delivering online content for numerous undergraduate- and graduate-level nursing courses. A variety of teaching methods to enhance classroom community and cognitive engagement are available, such as e-mail, class and group discussion boards, chats, virtual classrooms, wikis, and blogs. A convenience sample of nursing students enrolled in the Internet-based healthcare informatics courses during the fall of 2011 and spring of 2012 was recruited at the end of each semester. A nonexperimental, descriptive correlational design was used to determine whether there was a relationship among a perceived sense of community, cognitive engagement, and learner outcomes among undergraduate students enrolled in an Internet-based course.

Instrumentation

Rovai's[26] Classroom Community Scale (CSC) was used to quantify "sense of community" among undergraduate students in an IBL course. The CSC contains 20 questions that are ranked on a 0-to-4 Likert scale designed to

determine the perceived level of community within a classroom. The CCS contains two subscales of 10 items each called connectedness and learning community. Connectedness refers to the student's sense of belonging, trust, and cohesiveness within the group, whereas learning community relates to shared learning values and goals. Scores for each item range from 0 to 4, with subscale scores of 0 to 40 and a cumulative total score of 0 to 80. Higher scores indicate a greater sense of community. In a pilot study of 160 students, Rovai[26] validated the survey through exploratory factor analysis. Cronbach's α and Guttman split-half coefficients revealed an overall reliability of .90 and 0.89, respectively. For the subscales, connectedness had reliability coefficients of .86 and 0.85 and learning community had .84 and 0.76, respectively. Similar reliability scores were reported in a later study of 464 undergraduate- and graduate-level students.[5] Within the context of these studies, the CSC was determined to be a valid and reliable instrument for assessing a sense of community. Content validity for this study was determined by a panel of three experts in nursing informatics. All were current faculty members and had experience with online course design. A Content Validity Index (CVI) was estimated by asking the three experts to rate each item on the survey in terms of the relevance of each question related to responder's perceived sense of community in an online course using a 4-point rating scale: 1, not relevant; 2, somewhat relevant; 3, moderately relevant; and 4, very relevant. Calculation of CVI was done by taking the total number of survey items deemed to be very relevant or quite relevant by the experts and dividing it by the total number of survey items. For the survey, CVI was calculated at 0.90, which is considered adequate. In addition, a small focus group of four undergraduate students from a prior section of the course reviewed the survey for usability and clarity to determine face validity.

Cognitive engagement was evaluated based on the quantity (frequency) and quality of interactions within the Blackboard Academic Suite. Quality of discussion comments was evaluated by faculty using a 5-point discussion grading rubric. This tool was developed by the course director following a review of similar discussion rubrics used in other educational institutions. The five criteria used to determine overall quality of the student responses included (1) quality of comments, (2) relevance to topic, (3) student engagement, (4) use of references, and (5) clarity of comments. Faculty indicated for each item whether it was incomplete (0), limited (0.5), adequate (0.75), or complete (1) according to the description provided under each category. Total points ranged from 0 to 5 points, with 0 representing low-quality responses and 5 indicating high-quality responses. The tool was evaluated by the five faculty members teaching the online sections of the course to determine content validity.

Contributions to individual and group activities were evaluated through the tracking feature in Blackboard. Activities included the frequency of postings to the discussion board, classroom blog, group project, and creating group wikis. Learner outcomes were measured using the final examination scores and final course grade. Since grades may not be a true indicator that learning has occurred, a self-assessment question of perceived learning was added. This self-report measure was one question used in several other studies,[22,26] with a reported test-retest reliability of 0.85. The question was "On a scale of 0–9, how much did you learn in this class, with 0 meaning you learned nothing and 9 meaning you learned more than in any other class you ever had?" Demographic data such as age, gender, race, education level, and prior online course work experience were included to identify the sample population. There also were three questions related to specific teaching/learning activities that promote community and a free text box for comments. This part of the survey was called Student Characteristics and Perceived Learning Outcomes.

Procedures

Permissions from the institutional review board and appropriate internal committees were obtained before starting the study. Course instructors were trained on the protocols and procedures related to the study and how to facilitate the course for specific cognitive engagement activities. Grading rubrics were developed and attached to discussion board activities to provide direct entry of scores by the faculty to consistently rate the quality of discussions. The Blackboard software automatically tracked frequencies related to the discussion board, group discussion, wiki pages, and the class blog. The investigator was not directly responsible for assigning individual grades, therefore decreasing bias and conflict of interest related to the study. Students were recruited for the study during the last 3 weeks of the course in the fall and spring semesters. Starting 3 weeks before the end of each semester, announcements were posted weekly on Blackboard with details about the study, study procedures, potential risks or benefits, statement of confidentiality, and who to contact. Information about voluntary participation and consent was included in the announcement and on the survey. A link to the CSC, Student Characteristics, and Perceived Learning Outcomes survey was provided. This process was repeated 1 week before the end of the semester to solicit more volunteers. Cognitive engagement and learning outcomes data from those who volunteered for the study were extracted from Blackboard at the conclusion of the semester. Data from surveys, Blackboard discussion boards, wikis, blogs, and the online grade book were downloaded into a password-protected file on a secure server that could be accessed only by the investigator. Student names and numbers were removed to protect their privacy and confidentiality of data.

Data Analysis

Analysis of the data, using IBM SPSS version 17 (IBM, Armonk, NY), focused on addressing the research questions. For research question 1, correlational statistics were used to determine if a relationship existed among a perceived sense of community, cognitive engagement, and learning outcomes among undergraduate nursing students enrolled in an IBL course. For research question 2, independent *t* tests were used to determine if there is a difference between student responses in the fall and spring online course sections related to a perceived sense of community, cognitive engagement, and learning outcomes. For research question 3, descriptive statistics were used to identify the sample and examine teaching/learning activities that promote a sense of community. According to G*Power 3.1 (G*Power, Heinrich Heine University, Dusseldorf, Germany) analysis, to determine a correlation between variables with an α of .05, effect size of 0.20, and power of 0.80, a sample size of 67 would be adequate. Evaluating the difference between two independent means, a sample of 42 students per group was needed. Based on this a priori analysis, a sample size of 96 was adequate to provide enough power to conduct this study.

RESULTS/FINDINGS

There were 197 nursing students enrolled in the informatics IBL courses during the fall and spring semesters, of whom 96 (49%) volunteered to participate in the study. Most of the students were in the second semester junior year (72%), with the remaining in the first or second semester senior year (28%). Age ranged from 20 to 52 years, with a mean of 28 years. In addition to traditional first-degree students, there were returning RNs (26%) and a large number of nonnursing second-degree students (46%). Participants were predominately female (80%) and white (65%), with a modest number of Asian (14%) and African American (12%) students. In the fall semester, 53 students (39 women and 14 men) participated in the study compared with 43 students (38 women and 5 men) in the spring semester. Only 17% of the students had prior IBL experience, with most indicating that they had never taken an online course (82%).

Research question 1 addressed the relationship among a perceived sense of community, cognitive engagement, and learning outcomes among undergraduate nursing students enrolled in an Internet-based course. Total scores for perceived sense of community ranged from 18 to 71, with a mean of 46, indicating an overall moderate level of perceived community with the online course. Subscale scores also reflected similar results for connectedness (mean, 22.44) and learning (mean, 26.15). Total scores for perceived sense of community were not significantly correlated with any of the cognitive engagement or learning outcome variables, but the community learning subscale had a slight negative correlation with final grades. In contrast, there was a positive correlation between the total hits, total posts, and quality of posts. Quality of posts and examination scores were positively correlated to final grades. In essence, the more the student interacted online with faculty and peers, the higher the learning outcome scores. The relationship among sense of community, cognitive engagement, and learning outcomes is shown in Table 1.

Research question 2 explored the differences between the fall and spring online course sections related to a perceived sense of community, cognitive engagement, and learning outcomes. There were no significant differences between group mean scores for perceived community total scores, connectedness, learning, total posts, total hits, quality of discussions, or perceived learning scores. Possible scores for the midterm ranged from 0 to 65, and final examination scores ranged from 0 to 100. Midterm and final examination mean scores were significantly different between the two groups, with the spring group scoring higher on both the midterm (mean, 61.99) and the final (mean, 82.00)

Table 1

Relationship Between Sense of Community, Cognitive Engagement and Learning Outcomes (n = 96)

Variables	Connectedness	Learning	Community (Total)	Total Posts	Total Hits	Quality (Posts)	Examination Scores	Final Grades
Connectedness	1							
Learning	0.750[a]	1						
Community (total)	0.921[a]	0.941[a]	1					
Total posts	0.002	0.016	−0.003	1				
Total hits	−0.069	−0.021	−0.058	0.655[a]	1			
Quality (posts)	−0.058	−0.162	−0.140	0.493[a]	0.367[a]	1		
Exam scores	0.004	−0.008	0.006	0.000	0.013	0.148	1	
Final grades	−0.123	−0.210[b]	−0.191	0.194	0.104	0.457[a]	0.648[a]	1
Perceived learning	−0.110	0.038	−0.021	0.108	0.006	−0.073	0.099	0.102

[a]Significant at .01.
[b]Significant at .05.

examination than the fall group (mean, 53.06 and 78.53, respectively). Table 2 provides a comparison between the fall and spring semesters related to a perceived sense of community, cognitive engagement, and learning outcomes. Demographic characteristics related to age, race, program, and prior education were not significantly different between the two groups, although there was a significant difference in the number of students with prior online course experience. More students in the spring (28%) semester had prior online learning experience than those in the fall (9%) semester, but it is unclear how this would relate to higher examination scores.

The final question explored teaching and learning activities that promote a perceived sense of community with the IBL course. Over 50% of the students indicated that online group activities such as interacting in small groups, doing a group project, and working on a wiki page were helpful in promoting a sense of community. Other class activities that were reported as helpful included student introductions, discussion board questions, faculty interactions, and blogging. The activity that was least helpful was group naming. This practice was reported to foster identity for small group interaction and community building[30] but was not evident in this study. Table 3 provides a summary of teaching and learning activities that promote a sense of community.

Students also responded to open-ended questions about which activities did or did not promote a sense of community. These were evaluated and grouped into themes. Positive comments included a preference for the blog format over the discussion board, group project as a way to enhance community, faculty interaction, peers were helpful, and creating the wiki. Comments that identified issues with building community included lack of instructor feedback, group issues, feelings of isolation, and the online course being too time-consuming. Students also made recommendations to assist with building community such as providing more interactive content especially video lectures, smaller class size, rotating group members, and (of course) assigning less work. The greatest concern was the need for timely, interactive feedback from the instructors.

Table 3

Summary of Teaching and Learning Activities That Promote a Sense of Community

Learning Activities	Somewhat Helpful	Neutral	Helpful/Most Helpful
Introductions	17.7%	12.5%	69.8%
Discussion board	26.1%	7.3%	66.7%
Group project	27.1%	9.4%	63.6%
Small groups	30.3%	12.5%	57.3%
Faculty interaction	30.2%	14.6%	55.2%
Wiki page activities	32.3%	15.6%	52.1%
Class blog	34.4%	15.6%	50.0%
Group naming	43.8%	28.1%	28.1%

DISCUSSION AND CONCLUSIONS

Overall, a modest perceived sense of community was found along with a positive relationship between student engagement activities and learning outcomes. This has implications for nursing faculty as they strive to build community and collaborative working relationships among online learners. Care should be taken to clarify course goals or assignments to improve learning outcomes. It was interesting to note that most students (82%) did not have prior experience with IBL. This strongly suggests a need to prepare students for interacting in an IBL environment to include guidelines for individual and group participation. Faculty often assumes that students, especially those who grew up

Table 2

Comparison Between the Fall and Spring Semesters Related to a Perceived Sense of Community, Cognitive Engagement, and Learning Outcomes (n = 96)

	Fall 2011 (n = 53)			Spring 2012 (n = 43)				
Variables	Mean	SD	Range	Mean	SD	Range	*t*	*P*
Connectedness	22.23	5.34	9–30	22.70	5.56	11–36	−0.422	.674
Learning	25.32	6.25	9–36	27.16	5.39	13–37	−1.526	.130
Community (total)	47.57	10.76	18–66	50.09	10.79	25–71	−1.143	.256
Total posts	48.57	15.17	23–86	49.63	23.09	19–132	−0.271	.787
Total hits	764.13	293.73	308–1848	874.23	411.88	289–1830	−1.526	.145
Quality (posts)	36.95	2.11	31.5–39.7	36.92	3.10	26.8–40	0.055	.958
Midterm (0–65)	53.06	3.95	40–60	61.99	2.05	57–65	−13.409	.000[a]
Final (0–100)	78.53	8.14	62–98	82.00	7.64	62–98	−2.137	.035[b]
Final grade	88.50	4.24	74.8–94.1	88.82	3.91	77.8–95.1	−0.380	.705
Perceived learning	5.34	2.03	1–8	5.72	1.80	1–8	−0.962	.338

[a]Significant at .01.
[b]Significant at .05.

with computers, have adequate skills to navigate the technology. Self-assessment modules and/or orientation to online training prior to beginning a program of study should be required to prepare the student for online course activities. The community total scores were not significantly correlated with any variables, although the community learning subscale had a slight negative correlation with final grades.

This may imply that students who did not understand the learning goals, did not get adequate feedback from faculty or peers, or in some way felt disconnected had lower final grades. According to student comments, faculty feedback was lacking, which may be reflected in this finding. Perhaps students were not encouraged to ask questions or speak openly or feel that their educational needs were met. In asynchronous online courses, the instructor and student interactions are often sporadic and disjointed. Written feedback can be misinterpreted or poorly communicated by both parties. Faculty may also lack the proper skills to fully engage online students, and their "absence" may be perceived as uncaring or negative. Special effort is needed to ensure faculty presence through effective communication, encouragement, and timely feedback to each student.

There was a positive relationship between cognitive engagement activities and learning outcomes. In addition, the quality of posts and examination scores were positively correlated to final grades. Students who viewed and posted to the discussion board more often had higher quality posts and higher overall grades. This supports research findings that cognitive engagement through frequent communication and self-expression can enhance learning outcomes.[5,9,25] In comparing the fall and spring semesters, there was no significant difference between the mean scores for sense of community or cognitive engagement between the groups, although midterm and final examination mean scores high were significantly higher in the spring cohort. The groups were similar in terms of demographic characteristics, which did not explain this finding. A larger number of students in the spring group than in the fall cohort had prior experience with IBL. Perhaps those who were more familiar with using IBL were more comfortable interacting with the technology and performed better on the examinations. There was also the possibility that students who took the course in the fall had other classes with students taking the same course in the spring where sharing of information occurred. Security of examination information in online courses can be difficult and adds a new dimension to course preparation for faculty. Test pools, frequent updates to test questions, and use of multiple versions can protect against potential cheating. Learning technology may also contain features to allow timed tests, password protection, and other tracking functions.

Most students indicated that both group and individual learning activities, such as wikis, blogs, discussion board, and group projects, were helpful in promoting a sense of community. Online group activities are often more difficult to orchestrate in terms of student time but can promote a sense of community, which leads to better learning outcomes. Although group projects are an excellent way to build community, group collaboration is not always perceived as a positive learning experience. Students who are "absent" from online group forums cause other members to resent taking on the extra workload for assignments. Peer evaluation of group participation provides some control and mechanism for students to express their concerns. With the rapid changes in technology and constant software upgrades, more attention needs to be focused on providing education to faculty on how to best use these tools to engage students and improve learning outcomes.

Although these findings provide insight into the needs of online students and building community, there were several limitations of this study. The setting and sample were from one online course at a large university in the Mid-Atlantic region, which decreases the generalizability of the results. A small convenience sample was used, also making the results less generalizable. Some data were collected based on participant self-report and may limit the accuracy of the responses.

In conclusion, promoting community and cognitive engagement in the IBL environment has the potential to improve learning outcomes. Faculty feedback and interactive learning experiences are a critical aspect of creating a sense of community, but it must be timely and directed toward the individual as much as possible. A variety of learning activities, such as discussion board, blogs, and wikis, can be used to enhance engagement and build community between online students. Nursing is a collaborative profession where community building is a critical skill; therefore, innovative teaching/learning techniques that promote a sense of belonging and community are needed to improve learning outcomes, prepare students to provide quality patient care, and interact with an interprofessional team. The knowledge gained from this study can facilitate further research on IBL and the use of innovative teaching modalities that foster community building and cognitive engagement and ultimately address the learning needs of the healthcare professional.

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