

Critical Issues in Dental Hygiene

Building Online Learning Communities in a Graduate Dental Hygiene Program

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Introduction

Online learning in higher education has increased steadily over the past 10 years, and almost one third of the student body is enrolled in at least 1 online course.¹ The use of the Internet to achieve student learning outcomes has the potential to significantly impact the future education of dental professionals.^{2,3} Dental hygiene educational programs employing online technology for learning have been reported at the entry level, for degree completion programs and at the master degree level.⁴⁻⁷ However, programs vary greatly as to the number of online courses offered; some are 100% online or are categorized as blended programs. Blended (or hybrid) educational programs provide part of the curriculum in a face-to-face environment while other coursework is offered in an online format by means of a learning management system such as Blackboard, Angel, WebCT or Moodle.

Furthermore, individual courses within a program might use a blended approach as well combining face-to-face contact with online interaction. Courses offered in their entirety online follow a synchronous or asynchronous format. Synchronous formats require students and faculty to simultaneously be online to participate in weekly class sessions, whereas an asynchronous format does not have this requirement and students have the flexibility of participating in course activities whenever they choose, generally within a specified timeframe (e.g.

Abstract

Purpose: The literature abounds with research related to building online communities in a single course; however, limited evidence is available on this phenomenon from a program perspective. The intent of this qualitative case study inquiry was to explore student experiences in a graduate dental hygiene program contributing or impeding the development and sustainability of online learning communities.

Methods: Approval from the IRB was received. A purposive sampling technique was used to recruit participants from a stratification of students and graduates. A total of 17 participants completed semi-structured interviews. Data analysis was completed through 2 rounds - 1 for coding responses and 1 to construct categories of experiences.

Results: The participants' collective definition of an online learning community was a complex synergistic network of interconnected people who create positive energy. The findings indicated the development of this network began during the program orientation and was beneficial for building a foundation for the community. Students felt socially connected and supported by the network. Course design was another important category for participation in weekly discussions and group activities. Instructors were viewed as active participants in the community, offering helpful feedback and being a facilitator in discussions. Experiences impeding the development of online learning communities related to the poor performance of peers and instructors.

Conclusion: Specific categories of experiences supported and impeded the development of online learning communities related to the program itself, course design, students and faculty. These factors are important to consider in order to maximize student learning potential in this environment.

Keywords: dental hygienists/education, education, distance, online systems, teaching/methods, learning, program development

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weekly basis). Regardless of the format, students and faculty interact within the online environment to learn the course content and from each other. The development of online learning communities is one way to facilitate learning.

A learning community, in simplest terms, is a group of people “engaged in intellectual interaction for the purposes of learning”⁸ In an online course, members of a learning community engage in intellectual interaction and learn through communication with and collaboration among peers.⁹ The social constructivist theory maintains that all learning is an active process unique to each individual and knowledge is gained within the context of social interaction.⁹ This interaction can be maximized through the development of a community of learners to promote “active learning over passive learning, cooperation over competition, and community over isolation.”⁸ The development of a sense of community, instead of isolation, is achieved through social interaction between students and with faculty who actively engage in the course content.

Interaction in the online environment is necessary to develop social presence, teaching presence and cognitive presence. The 3 presence components interconnect and provide a theoretical framework for a Community of Inquiry.¹⁰ These components are integrated for the development of the community as well as the intellectual pursuit of inquiry.

Social presence is the ability of learners in the online environment to perceive each other as real people through interaction to establish a social and emotional identity. Factors influencing the establishment of social presence are: affective expression, open communication and group cohesion. Affective expression involves projecting oneself through self-disclosure of emotions, values and beliefs. Open communication is based on the development of trust between learners in order to reveal themselves in an environment free from risks. Group cohesion is the third factor in developing social presence and involves the collaboration of learners and the creation of a group identity.

Teaching presence is established by the faculty member who designs and organizes the learning experiences before and during the course. Another factor important for establishing a teaching presence is the facilitation of the interaction among the online participants by designing and implementing activities that extend the course content. A third factor is providing direct instruction to the learners as the subject matter expert to correct misconcep-

tions, direct the discussion and provide additional information to enhance learning to a higher level.

The third component of the Community of Inquiry framework is cognitive presence, which is important for a high level of knowledge construction and critical thinking. Learners progress through cognitive presence in phases beginning with an event to stimulate the need to learn, followed by exploration through an exchange of information, integration and connection of ideas and, lastly, the application of new ideas (resolution).

Most of the research using the inquiry framework has focused on 1 of the 3 presences;¹¹⁻¹⁴ however, more current literature considers all 3 components within the same study. Akyol and Garrison conducted an investigation to determine the relationships among the 3 components of presence and perceived learning and satisfaction in the course.¹⁵ The findings indicated significant positive relationships between social presence and satisfaction, teaching presence and cognitive presence, teaching presence and perceived learning, and teaching presence and satisfaction. Other significant relationships were found between cognitive presence and perceived learning, and cognitive presence and satisfaction. Cognitive presence, as compared to teaching presence, was more influential on learning. The researchers noted a trend over the timeframe of the semester in each of the 3 components:

1. An increase in group cohesion in social presence
2. An increase in direct instruction for teaching presence
3. Integration in cognitive presence

Another study supported the effect of these 3 presences by finding that social presence is a mediating factor between teaching presence and cognitive presence.¹⁶ Social interaction might be the precursor to deep learning, but teaching presence is important to provide structure and leadership for higher levels of learning to occur.¹⁷ In other words, teaching presence is needed to help students shift from social presence to cognitive presence.¹⁸

Most of the research on online learning communities has been conducted over the length of a course and provides a short term view of this phenomenon.¹⁹⁻²³ Several qualitative studies have been conducted to investigate this phenomenon in undergraduate and graduate online programs.²⁴⁻²⁷ However, these studies provide a limited perspective of learning community development viewed from the start of a program to its completion.

Therefore, more qualitative research needs to be conducted to understand students' experiences in online communities throughout the entire curriculum.²⁷

Studies on dental hygiene students in online programs and their experiences with building and sustaining online learning communities is not well documented in the literature. Dental hygiene educators accept the online format as a means to learn; however, little is known about the phenomenon of building communities to enhance learning. Therefore, the purpose of this qualitative inquiry was to explore graduate dental hygiene students' experiences with online learning communities. The research questions established for this inquiry were: what experiences promote and impede building online learning communities, and what experiences promote and impede the sustainability of online learning communities?

Methods and Materials

A qualitative case study method is beneficial to conduct an in-depth analysis of a phenomenon where context is important.²⁸ The phenomenon in this case study was building and sustaining online learning communities, and the context of this inquiry was an online graduate dental hygiene program at a northwestern university in the U.S. The requirements for the graduate program included core courses all students completed in: research, program development and evaluation, special needs populations, advanced dental hygiene theory, and leadership strategies. Additionally, 2 campus visits, each one lasting 1 week, were required. The first visit focused on orientation to the program, and the second visit focused on seminar course with topics in education, research and practice. Completion of a thesis was a program requirement. Students were required to complete 1 of the 2 specialty areas in education or community health consisting of 2 didactic courses, 1 elective course and a practicum. Each online course was designed with a forum for the purpose of informal postings and weekly announcements by the faculty. These discussions were named the "Coffee Shop" or "Communication Center." Course design consisted of weekly reading assignments and required discussions based on questions, group activities and projects, or peer review activities. Participation was evaluated using a rubric and was assigned a percentage of the final grade computation. Most courses required 2 or 3 projects for the summative assessment. The online program employed an asynchronous format because of the span of time zones across the nation from which the students were located.

Approval was received from the university's Internal Review Board (HSC #3618) before commencing with participant recruitment. A purposive sampling method was used to recruit participants from various strata of students enrolled in the online program as well as graduates of the program. The purposive sampling method was employed to provide a better view of experiences related to the progression of learning communities throughout the entire program. A total of 5 students were targeted from each stratum: completion of 1 year, 2 years, 3 years and graduates.

The interviewer, who was a graduate of the program, contacted students by email to invite them to participate in the study. Those students, who responded to the message and indicated an interest in participating, received an informed consent form and a questionnaire to ascertain demographic data and the stratum to which they belonged. When both of these items were completed and returned to the interviewer, a personal interview was scheduled. A list of questions was sent to participants at least 1 week prior to the interview to help prepare them for the data collection. An incentive was offered - participants' names were placed in a drawing for a \$50 VISA® gift card.

Personal interviews were conducted in-person or over the telephone because of the wide geographic distribution of students and graduates of the online program. A semi-structured interview was followed, using the questions provided to participants; however, the interviewer had the flexibility of asking follow-up questions to gain more in-depth data about the participants' experiences. Participants selected a pseudonym and this name was used during the interview to protect the individuals' confidentiality and anonymity. Interviews lasted 1 to 2 hours and audio was recorded using an Olympus™ digital voice recorder. The digital files were downloaded onto the interviewer's computer and copied onto a CD. The audio files were transposed into written documents by a transcriptionist who confirmed the written data were verbatim.

The word-processed transcripts with the participants' pseudonyms were used to analyze the interview data by a second researcher. Each transcript was read through in its entirety the first time and during the second reading the researcher coded the data using a word-by-word, line-by-line, segment-by-segment approach to deconstruct the data into small pieces.²⁹ These initial codes were considered provisional and were changed as the researcher analyzed other interviews using a constant comparative method for determining similarities and differences between participant experiences.²⁹

The second phase of data analysis was to develop categories that explained larger segments of data and incorporated several initial codes.²⁹ During this phase, categories and subcategories were created as the data were reconstructed to form broad themes of experiences emerging from the data at a higher abstract level.²⁹

Using 2 methods of verification are adequate to establish the validity of the data analysis.³⁰ The first method involved the interviewer serving as a peer reviewer during the second phase of data analysis to ensure the interpretation of the data by the second researcher was consistent with the actual data from the interviews. Another method employed to establish validity was the completion of member checks, All of the participants reviewed the data analysis and confirmed the interpretation of the data was congruent with their experiences. A drawing for a second VISA® gift card was offered to participants who completed the member check activity.

Results

A total of 17 participants completed the interviews, and all were female. The stratified sample included 2 students who had completed 1 year of the online program, 6 were second year students, 4 were third year students and 5 participants had graduated from the program. Of those, 11 did not have experience with online learning prior to enrollment in the graduate program, whereas 4 individuals had completed 1 to 2 online courses, and 2 participants had completed 5 or more online courses. The factors motivating participants to enroll in an online dental hygiene graduate program are reported in Table I.

The data analysis revealed a collective definition of an online learning community as a complex synergistic network of interconnected people who create positive energy. Characteristics of learning communities are presented in Table II.

Experiences Defined By the Participants That Promote Building Online Learning Communities

The data from the interviews were analyzed and 4 broad categories of experiences were found to promote the building of online learning communities. The categories were related to the program, learners, course design and faculty.

The participants revealed 1 experience with the program, the orientation course, was important for building online learning communities. The ori-

entation was a blended course with required on-line activities before the on-campus portion. This experience was beneficial for setting the stage to build community. Setting the stage was essential for understanding how to contribute to online learning, getting connected to peers and faculty, establishing commonality, sharing common experiences, creating a network and making online communication easier. One outcome of the orientation was for students to learn how to contribute to the online learning community, as depicted by participant "Sally":

"So for me I would say that the orientation [was important] to orient us to the program and how it works, how we (would) be using various means of technology to communicate synchronously and asynchronously; using Skype, for example to peer review each other's papers. Really knowing what was expected and knowing our role to contribute to the learning environment."

The initial interaction of students during the Getting-to-Know-You discussion in the online portion of the orientation course was beneficial for peers engaging and connecting with each other, which were important aspects of establishing the sense of community. "Teeth Geek" explained:

"The introductory forums of greetings when we told a little bit about ourselves and people interacted online and contributed a lot. For example, how to be connected and you could see the development as time went on of learners interacting very positively with one another."

Connecting with peers at the on-campus orientation was evident for establishing a commonality among students who were entering the graduate program. "Polly" explained her reluctance to being a new graduate student:

"The new student orientation...was a nice time to meet everyone because when I first stepped out of my car, I wanted to turn around and go home because I just didn't know what I was getting myself into. Meeting everybody was wonderful because we could support each other...we all found out that we had the same fears and we felt the same way about ourselves and this transition."

Setting the stage also meant meeting in person and the opportunity to connect a face with a name. These factors were important for establishing the online community as depicted by "Opal Queen":

"I would say absolutely that getting to know someone, just their face, putting a face to whom

Table I: Factors Motivating Participants to Enroll in an Online Dental Hygiene Graduate Program

Factors	Participant	Participant's Statement
Improved access to education	Katy	"I live in the middle of nowhere and this program was a great option for me because I would have to travel quite a distance to get an education."
Flexibility of working on coursework	Penelope	"...on my own time and I could move it around my family schedules, work schedule, and school schedule."
Expand career opportunities	Irma	"I practiced for four days a week and I wanted to do something more with my degree. I wanted to continue my education so I could have more opportunities in maybe teaching or I just wanted to do something besides clinical dental hygiene...I wanted a master's degree in dental hygiene or education, but I thought that because I have experience in dental hygiene, it would make sense to do a dental hygiene master's degree."
Earn a terminal degree	Steel Magnolia	"...another thing that was a draw was it's the terminal degree right now in our profession and the college [where I teach] puts extra weight on it [terminal degree in the discipline]."
Opportunity to interact with dental hygienists from a diverse geography	Orange	The online program provided the opportunity to "... meet people from different parts of the U.S. and Canada."

you are interacting with....In order to build a relationship I think you need to have that face-to-face action or interaction."

The on-campus visit was vital for sharing common experiences to establish the community, as students and faculty participated in activities outside of the formal instructional events as explained by "Bluthner":

"We had an intense period of time together where you were all together day and night. You're having dinner together and laughing and talking about things and it's the best friendship builder."

The on-campus visit with the personal interaction helped establish a network of learners who would support each other during the program. "Glory" discussed:

"I think your orientation was really big. It was something that connected a lot of us. I was close throughout orientation and we just continued to be close as friends. We still call each other. We have our [telephone] numbers from orientation and sometimes if I have a question or I need something, I feel comfortable with calling."

In addition, the on-campus visit provided the opportunity to interact with faculty members teaching online courses as indicated by Bluthner:

Table II: Characteristics of an Online Learning Community

- Learners who are passionate about their educational journey and their profession by expanding the greater body of knowledge.
- A shared vision to work together to achieve a common goal.
- A supportive community where everyone puts forth their professional best and contributes freely and generously with one another.
- People who are committed to learning and are prepared to contribute their reflective thoughts in meaningful response to other members.
- Learners who value each other sincerely and are genuinely concerned about each person succeeding.
- Learners who are empathetic to each other's situation and provide encouragement to each other.
- Opportunities for interaction and learning from each other.
- Experiences are shared to help everyone grow and change.
- A healthy exchange of ideas is fostered and improved ideas are created.
- Members express their ideas freely in a safe environment and learners are accepting of each other's perspective.
- Open and honest feedback and constructive criticism are provided.
- A supportive facilitator who is flexible is present.

Table III: Common Experiences Promoting Online Learning Communities

Common Experience	Participant	Participant's Statement
Commonality being licensed dental hygienists	Irma	This commonality provided "foundation to help build relationships."
	Whiskey	Placed everyone on an "even level" and "broke down barriers."
	Polly	"Commonality did contribute to the building of relationships by being able to share clinical experiences, share professional opinions, share clinical techniques. This sharing contributes to building trust and respect towards one another...[W]hen I feel a common bond, I feel a common thread, when I interact with my colleagues it increases my learning because I am comfortable and know I fit in. "
Commonality of being graduate students	Orange	"There is always someone else who can relate to that and provide support, but definitely I think because we are all in the online program as well. We all have the same goals and desires."
Commonality of being women managing multiple roles	Katy	"Everybody was juggling many roles from teaching to families. We were on the same page with everything...We were in the same situation and we could talk to each other and kind of work things out together."

"I think for me that the site visit's best part was seeing my professors."

The second category of experiences promoting online learning communities was related to the learners and their interaction with each other. Student experiences were based on the commonality of being dental hygienists and graduate students, yet different experiences in their education and careers provided opportunities for learning. The common thread between students was their profession, status as graduate students and females managing multiple roles. The participants' perspectives on common experiences are reported in Table III. Although these common threads helped students connect with each other, the variation in their experiences as clinicians and educators provided rich opportunities for learning by sharing alternative perspectives and ideas. "Penelope" explained:

"I made new friends through the online program and the thing I really like is that they are from different parts of the United States and Canada. I am getting input and viewpoints of people who are working in the same profession as me, but they have different ideas or different ways they approach a situation or problem and it really helps me learn. It just adds to my experience. I think it enriches the learning experience because people bring so much to the table. It is just a whole different learning experience."

Students experienced feeling socially connected to peers through the development of personal relationships as family and friends. "Penelope" commented: "I felt like I belonged to an online community and had friends there."

"Polly's" experience included: "The peers made online learning more colorful, more positive, more fulfilling and just a more positive experience....We developed friendships and family; in ways it's like family."

"Bluthner" felt as if the relationships developed online were more intimate than in a face-to-face situation:

"I think the social connection in online learning communities is just a fascinating thing for me because people are sharing really intimate details of their life....I think staying socially connected is because people share so much of their life because they are not face-to-face and they feel less guarded, so you actually get a deeper level of intimacy."

Communication that was encouraging even when peers had differing viewpoints was helpful in developing the sense of being socially connected to each other. "Whiskey" portrayed this aspect of communication:

"My class is generally diplomatic; they were all pretty encouraging. Even if someone had a differ-

ent perspective than someone else, it was always worded in a different way that was...always encouraging. I never felt challenged and they were never negative or threatening to each other...It worked really well for me coming out socially that way; otherwise, I would have crawled right back into that shell and been really careful how I answered."

Communication that was encouraging was influenced by their empathy for one another and contributed to the development of a strong network for support. "Katy" expressed her thoughts:

"I don't think I could have completed my courses without my peers. The people who were in my discussions in my courses were all in the same boat. Everybody is juggling school, their families, work commitment and it's hard...You always had someone to talk to and they would try to lift your spirits up."

Peers felt socially connected through the mutual appreciation and respect for each other that promoted open and honest communication where they felt the freedom to express differing viewpoints. "Opal Queen" identified that being adult learners contributed to learning:

"I feel like being adult learners we weren't afraid to get express our opinion or...to challenge each other somewhat and say, what about this or what about that. To help us look at different perspectives, which I would say I became very connected in that way. Everybody seemed to be open-minded to varying viewpoints...I think we all grew off of each other...So I think that really helped me connect."

Being supportive in the online learning environment was experienced as being a contributor, receiving positive feedback, and mentoring each other. Participants' statements are reported in Table IV.

Graduate students in the online program interacted with each other in a variety of ways outside of the program and online environment to socially connect and ask for guidance on coursework. Communication through personal telephone calls, e-mail messages, Skype and Facebook provided the means of informal interaction among students.

The third category of experiences influencing the promotion of learning communities was related to the online course design. The design of courses for communication and interaction among peers and with the faculty was important. Formal

communication in weekly discussions meant being an engaged learner by actively thinking, applying and analyzing the postings. In addition, the formal discussions required interacting and sharing ideas with others. This interaction was described as "enriching the learning experience" (Penelope) and forcing "you to do more in-depth thinking" (Tango). The quality of the postings were deemed important, as mentioned by "Polly":

"More in-depth postings where you get more information and ideas that you have to ponder. It makes you open to everyone when you realize there is an endless amount of ideas to help problem solve. It adds up to a higher level of knowledge and its stimulating too. When you are stimulated, it opens up your mind and you are motivated to learn more."

As "Sally" pointed out: "the online environment was nice to be able to reflect on something and post it at a later time or ask a question." "Penelope" commented: "I sound more intelligent online than I do in person because you have time to think about your response." The online discussions provided an opportunity for all students to interact with each other as described by "June":

"In a traditional classroom usually there are two or three people who dominate the conversation and everyone else keeps quiet and listens, but online, everyone has an opportunity to jump in and throw in their two cents and so for quiet people, it can help them."

Weekly discussions also helped overcome the initial feelings of isolation and intimidation, "but immediately after sharing fears and reservations among each other, we became very reassured by one another and felt we had great friendships and a family support" (Polly). Specific guidelines for postings helped establish the feeling of being a learning community. For example, "Ella" mentioned:

"Having to post a mandatory initial posting and then having to do a mandatory response to two or three other people has helped to establish that feeling of being a learning group"

Rubrics to evaluate participation in the weekly discussions helped students understand the expectations for the quality and quantity of the postings. Using proper online etiquette and emoticons to support the written word facilitated positive communication. Smaller groups were favored because "you can't interact with the whole city, you need a smaller group to interact with" (April).

Table IV: Mentorship in the Online Learning Environment

Mentorship	Participant	Participant's Statement
Providing peer support	Sally	"...it just made it a better learning experience because each person had their strengths and weaknesses, but could contribute. Sometimes it wasn't so much what others could contribute to me, but I learned so much by helping them."
	Penelope	"It's just nice to get a pat on the back and say hey, you did good on that or what about this...I just appreciated the feedback. I appreciated the guidance and the direction..."
Mentoring less experienced students in the program	Steel Magnolia	"Quite a few of my peers in their examples and their mentoring [made me feel connected]. One person in particular in our cohort is just a mentor by nature and kind of took me under her wing, which brings you into the fold and that was very helpful."
	April	"I really did [enjoy interacting with peers] and continued to learn so much from the mere experience and also just being there for some of the younger students. I know we had some younger students in our class who they were going through challenges, I guess feeling insecure and feeling a lack of confidence about their skills and they would share some of their concerns and those with a little more experience were there and could give them some good advice. I think it was just great and I learned a lot from the advice they gave the younger students too."

Experiences with informal chatter in the courses' Coffee Shop or Communication Center contributed to sharing personal information and getting to know peers better to build relationships and provide a strong supportive network. "Teeth Geek" summed up this interaction:

"I am glad we have the coffee shop and people post information about their new puppies or personal things. That also helps build character; I mean it fills out that person. We learn more about each other and can share illnesses and losses. It's important to make an effort to support our peers."

Experiences with group activities and assignments were beneficial for building learning communities when responsibilities were divided among group members and everyone contributed to the collective assignment. Having the same high standards for completion of group activities was also important. When peer review of assignments was used as an activity in the weekly discussion, it provided an opportunity for guiding each other and gaining different perspectives. "Penelope" found peer review beneficial: "You are getting feedback from different sources."

The last category of experiences to build online learning communities related to the faculty. Faculty were viewed as members of the learning community and their role was to facilitate learning. Their role was a strong influence on the building of community. From "Sally's" perspective:

"Faculty members helped build the learning communities by facilitating dialog, class activities and exercises within the coursework...the instructor was a strong variable in the learning environment."

"Glory" commented: "Yes, I do think they should be part of the learning community by providing examples of their own experiences and ideas, supporting and approaching issues or students or patients in theory or practice."

"Whiskey" commented: "[the faculty's role was to] provide insight and difference perspectives." "Tango" felt: "[faculty should] be active in the course and be active in discussions. They should have a presence within the course and help build those relationships and keep everyone connected."

From "Penelope's" perspective:

"They are there to mentor you and help you along the way with their postings." Irma identified faculty as a "guide....when they are supportive of you and what your peers have to say and helping to build the community."

"Bluthner" reported: "be a guide on the side, but don't disappear and when students start going off in the wrong direction, re-guide them." Another role of faculty in discussions was to "moderate if things got a bit heated between people" (Online RDH).

Faculty have to be "aware of online teaching principles, having a capacity, being an expert in the material to teach the course, having the course prepared the first day of class and you see everything is organized..." (Bluthner). "Teeth Geek" provided thoughts on faculty: "most instructors have been very open to diverse learning styles of their students." Another aspect of managing the course was "encouraging preparation, asking thought provoking questions for discussion, giving good preparatory assignments and then asking reflective thought provoking questions based on the required reading" (Online RDH). "Glory" indicated: "[some faculty members] have been motivational and encouraging students to engage in critical thinking instead of giving you the answer." Encouragement also extended to "students to work in collaboration....Having us interact with people who have different viewpoints that we can learn from..." (April). Other course management experiences were faculty providing helpful feedback and suggestions, being available to answer questions and responding in a timely manner.

Faculty members who were attentive to adult learning principles influenced learning in a positive manner. "As adult learners we come in with a lot of experience that we can offer and contribute. It was nice when instructors gave you that opportunity" (June). Presenting lessons using adult learning principles, requiring reflection activities, being less prescriptive and having the freedom to "think outside the box" (Sally) contributed to this positive situation.

Experiences Impeding the Building of Online Learning Communities

The same 4 categories of experiences impeded the building of learning communities: program, learners, course design and faculty. Program factors that presented as obstacles related to student experiences after they left campus and entered the first week of core courses. These challenges included feeling isolated and on your own, "getting

acclimated to the program and getting to know the expectations of the program" (Sally), and learning the technology, navigation in the online system and the "language of online communication" (Polly). In addition, "the fears of being in graduate school because it is intimidating. It's a different type of learning and the [discussion] questions we get are more thought provoking and not requiring black and white answers and that was intimidating because we didn't know if our answers were right or wrong" (Polly). Writing postings for the weekly discussions was viewed as a "challenge being articulate in the discussions without taking an inordinate amount of time" (Sally) "because you want to say something meaningful and thoughtful to contribute to the community" (Teeth Geek).

The second category of experiences impeding development related to the peer community of learners. The weekly discussions and the manner in which peers responded to each other was a source of not feeling supported. "Katy commented: "[peers sometimes] were late posters and procrastinated" and "sometimes people would be minimalist and never get a response to their post." Postings that lacked constructive criticism and sensitivity were interpreted as critical and confrontational and did not contribute to the development of community. Misinterpreted postings because of the lack of visual and auditory cues also were a source of problems: "learning in online groups you can't see each other's face and don't always know what tone the posting is carrying" (Bluthner).

The lack of dental hygiene experience was another factor impeding the development of learning communities. Graduate students with less experience in practice felt they had less to contribute to discussions, as expressed by "Katy": "Sometimes people would bring up an example and I couldn't contribute as much just because I didn't haven't had that experience." The lack of practical experience was a source of frustration for more seasoned dental hygienists, as depicted by "Patsy":

"It wasn't about me learning, it was about me teaching these people who were too inexperienced to be in graduate work. They were too young. You have to have some life experiences, but when they come in straight from an undergrad degree, it takes a lot to get them to understand."

Participants who identified themselves as predominately individual learners faced challenges within the online learning environment. "Tango" felt: "being an individual learner gives you more vulnerability because you are out there blazing

ahead without a whole lot of support." This type of learner found the development of community challenging because "I don't need to develop those close ties. It helps, but it's bad in that I was out there on my own" (Tango).

The third category of experiences that impeded the development of online learning communities was related to course design. Some students felt as if the hours spent preparing for the course were not consistent with the credit hours. "There were a couple of courses in meaning well and it was great course content, but it was just overwhelming" (Sally). "Bluthner" had similar feelings "I felt a little overwhelmed by all the reading and typing and reading and typing and reading and typing."

One core course not taught by a dental hygiene faculty member did not use a discussion format or peer review during weekly activities, only lectures, reading assignments, quizzes and a final assignment. Lectures were posted as Adobe presentations and students listened to the presentation while following the PowerPoint slides. "A disconnect from the rest of my class" and feeling "pretty isolated" were some themes expressed (Ella). In addition, discussions requiring students to summarize information from the reading did not "spark interest or opinions" (Orange) about the course content. The length of required discussion was viewed as a problem by "Glory": "We actually had to do a mini research paper every week for the discussion and it is taking 8-10 hours; that's not reading or anything else."

Large group discussions were problematic "when there were too many people posting and interacting, it became overwhelming and you may not get that bonded feeling" (Bluthner). Group projects were experienced as challenges "to get everybody on the same page and coordinated and working in different time zones and if someone's heart wasn't in it, it was hard to get people together as a group" (Sally). "Online RDH" offered this comparison with a traditional classroom setting:

"When you are in a face-to-face classroom, everyone has the same face-to-face time, but in an online course, you don't and that's....why there is a problem with group projects because you have to accommodate everyone else's schedule."

Other challenges experienced by groups were members riding on "the coat tails of others" when responsibilities were not equally divided among members. When group members did not adhere to the same high standards and expectations as

other group members, this too was a disconcerting point for group activities.

The last category of negative experiences revealed by the data analysis was related to faculty's lack of preparation for teaching an online course, lack of course management and lack of interaction with students. The lack of preparation included "no online teaching experience" and "the biggest hindrance would be the lack of experience when the instructor didn't know how to use the technology" and "the instructor would ask me, how do you do this and how do you do that, because the instructor hadn't done it before and that class was horrible" (Irma). In another instance, a faculty member taught another instructor's course and used the same content in the previous course. The new instructor "didn't know what the other instructor was expecting for the assignments and she was flying by the seat of her pants" (Irma).

Experiences with the management of the course related to "links did not work and we couldn't access information that we were supposed to read and had to be posted [in the discussion]. That was frustrating and you think you're not going to know what you need to know" (April). Other frustrating experiences occurred when the wrong syllabus was posted in an online course, weekly course modules were not available for viewing and papers were not graded in a timely fashion.

Challenges in the online learning community were experienced when interaction between the faculty and students did not happen on a timely basis or was infrequent and did not support the content of the discussion. "It was an emotionally draining time for me because I was not able to communicate with the instructor" (Glory). Negative postings and favoritism to some students' postings also challenged the building of community. Students did not feel supported when feedback on assignments was not provided and faculty failed to fulfill the mentor and facilitator role. "Polly" felt: "Instructors hindered the learning community and when you have negative feelings, that hinders learning because you are not motivated."

Interestingly, when the faculty did not fulfill their responsibilities, "I was fortunate to have supportive peers who made it doable for me" (Teeth Geek) and "we bound together as a class... and supported each other. If there had not been a sense of community within the class, I don't know that we would have learned anything" (Online RDH). "Polly" summarized: "We did learn from one another and we learned the power and impact of supporting each other."

Experiences Influencing the Sustainability of Online Learning Communities

As students progressed through the curriculum, several experiences influenced the phenomenon of building or impeding the sustainability of online learning communities. The dynamic composition of students within the online courses was an experience that both promoted and impeded building community. As students progressed through the curriculum, they interacted with peers who were not members of the initial support network established at orientation. Students developed an awareness that some "learning groups were strong and then a new group didn't have the same synergy or energy and it was different" (Sally). Even though students did not meet face-to-face, the interaction in the courses made "Whiskey": "Feel like I know them, none the less, and I can talk freely with them and we know each other's styles." Other experiences promoting community stemmed from the "ability to communicate did get stronger" (Sally) throughout the program and "relationships continue" when students meet again "at some future point" (Penelope). Maintaining peer relationships was easier when interaction occurred in multiple courses because students were "more engaged" and "the more apt you were to continue the relationship" (Patsy). Being more relaxed and less formal interacting with each other helped people connect on a higher level and feel closer to each other. "Penelope" observed: "You grow as you go," representing the intellectual development of the community and a higher connection among peers.

The dynamic nature of community membership also presented challenges to developing learning communities. Some students felt it took longer to understand these peers and delayed the community development. "Irma" indicated: "There really wasn't a relationship." Another aspect of interacting with others outside of the initial support network was influenced by taking courses out of the order of the recommended sequence.

The second summer campus visit and coursework in the emphasis areas (dental hygiene education or community/rural health) helped sustain the learning communities. Students viewed the second on-campus visit as a reunion with peers who attended the same orientation. This face-to-face opportunity also was important to personally interact with those who did not attend the same orientation, but were familiar from interaction in previous courses. "Polly" commented "It was like having a pen pal who you had gotten to know so well and then you were able to see them face-to-

face and that helped strengthen the relationship all the more." The second on-campus visit "cemented the friendship and took it to another level" (Polly) by interacting and connecting through group learning and sharing common experiences outside of the course. The emphasis area courses presented opportunities for peers to develop closer relationships because they had the same goals.

During this phase of the program challenges also existed. Competing responsibilities with careers and family made it difficult to put full effort into completing coursework. In addition, as students progressed through the curriculum, peers in the initial supportive network progressed at different rates and students lost contact with each other. As "Tango" lamented: "The longer you are in the program, the further you're spread out from people.... As time went on, I lost a lot of my classmates who I felt close with." From "Ella's" perspective:

"I lost pace with my cohort...Seeing new faces I hadn't met was detrimental to the progression of relationship building over the semesters...So I think that aspect of everyone being on their own time tables is detrimental in maintaining relationships throughout the program."

As students enrolled in online elective courses in other disciplines, they were faced with multiple obstacles for building learning communities. Dental hygiene students did not feel connected with students in other disciplines because they perceived the other students were not interested in dental hygiene and there was a lack of commonality (feeling like an outsider). The large class size in elective courses presented challenges to interacting with everyone in the course, working more independently to learn and posting just enough to get by. This phase of the program was viewed as very different from their positive experiences in the dental hygiene courses.

As students entered the thesis and practicum phase of the program, they also felt disconnected with their supportive peer network. "Online RDH" commented: "I miss everybody. I really do. The only people I am speaking to are my thesis advisor and my practicum advisor." Students entered the thesis course at different times and progressed at different rates through the thesis process. There were no required weekly discussions for peers to interact; however, personal communication outside of the program helped people feel connected, but not as much as when they were in the core courses during the mandatory weekly discussions. Thesis work was viewed as an independent learning situation. "Sally's" perspective on thesis was

that the learning community dynamic changed: "Everybody is in their own mode and there was less communication and dialog in the thesis classes." Faculty who were members of the thesis committee interacted individually with each student. "Tango" remarked: "...the only lifeline you have... [is] your connection with your [thesis] advisor."

Discussion

The findings of this qualitative case study provide insight into students' experiences influencing the development and sustainability of online learning communities. These experiences were categorized into program, learners, course design and faculty influences. Each category has implications for designing and implementing an online graduate program.

Students valued an online program for the improved access to higher education because of being location bound and not having institutions offering advanced dental hygiene degrees in close geographic proximity. In addition, the flexibility of an asynchronous format provided the opportunity to participate in coursework while being active with their family and employment responsibilities. The online program also provided a means to expand career opportunities and gain a terminal degree in dental hygiene, an important factor for individuals who were already teaching in dental hygiene programs.

Participants in this study were able to clearly articulate a definition and characteristics of an online learning community. They also valued the community as a means to learning. A possible explanation of this finding is that most of the participants were focused on dental hygiene education as their emphasis area in the program. Other researchers have found conflicting perspectives on the meaning and value of learning communities. Conrad noted that students had difficulty articulating a clear meaning of community; however, they felt a community developed over time.³¹ Students and faculty can have limited community awareness and place little value on community development, citing the investment of extra time and effort as a downfall.²⁷ On the other hand, students can place a high value on community as an essential element for learning and clearly articulate the meaning of community focusing on being a member of a group.²⁶

Participants' experiences with the program's orientation course contributed to setting the stage for the development of social presence within the online learning community.¹⁰ Personal interaction during formal and informal group activities seemed

to build a foundation for developing a sense of group cohesion - an important factor in the development of subsequent communities within the online courses.¹⁰ Other researchers have reported students in online programs find a face-to-face encounter during an orientation before classes begin very important for building community.^{26,31} Program administrators need to be mindful of mechanisms in place for students to share professional and personal information to gain a sense of identify within the online community. When face-to-face meetings are not planned, activities within the online environment should be used. For instance, each student can design a profile, including pictures, on a secure online site and release the site for other students and faculty to view. Another strategy is for each course to have a Getting-to-Know-You activity during the first week of the semester to establish social presence through the development of a personal and professional identity among learners and the faculty member. This strategy would assist new students entering the cohort an opportunity to establish their presence in the community.

The first few weeks of online courses appeared to present some challenges as learners felt isolated and navigated the online learning environment on their own. Students who experienced these challenges initially felt vulnerable and intimidated; however, a strong peer network helped them overcome these obstacles. The literature reports challenges that learners face within the online environment. One challenge is feeling isolated and disconnected from peers and faculty.³² Other challenges relate to frustration using technology and trying to complete collaborative learning activities.^{24,33} When feelings and frustrations are not rectified, students' performance in a course might suffer, and withdrawal from an online program can result. One way to overcome these challenges is through the development of online learning communities to keep students connected with peers and faculty members and to provide a strong support system to reduce attrition.^{27,34}

The second on-campus visit was a program factor that contributed to the sustainability of online learning communities. This face-to-face experience was important to take existing relationships and social presence to a higher level by engaging in shared activities.¹⁰ Lee et al also found that a second on-campus visit in the middle of the program contributed to maintaining a sense of belonging to a community.²⁶ In the present study, peer relationships did get stronger as students progressed through the program and interacted in multiple courses. Students felt an investment in

the community as they realized the importance of each other contributing to their own learning. However, students had different experiences with new learning communities consisting of students who did not complete the orientation course together. Sometimes the communities did not have the same synergy as previous communities, whereas other communities connected with new students. One detrimental aspect to sustaining community was identified as the ability to progress through the program at different rates, thereby losing contact with the original cohort. As administrators design online programs, they should consider whether a cohort of students will complete coursework together as a group or whether students can progress at their own rate with a flexible program of study. Perhaps the cohort approach to an online program enhances the social presence of the learning community by sustaining the same group of students over the entire curriculum.

Sustained social presence with peers was a problem identified by participants during the thesis and practicum phase of the graduate program. Although these courses were independent learning experiences, students felt a need to remain connected to a learning community and maintain a social presence among peers. Administrators need to develop mechanisms to continue opportunities for social presence throughout the entire program in practicum, thesis and capstone courses. For instance, weekly discussions could be established in an online course for students enrolled in independent learning experiences.

The second category of experiences related to the learners and the development of social presence.¹⁰ Positive interaction built the community through encouraging communication, providing emotional support, valuing different viewpoints, gaining mutual appreciation and respect for each other, and communicating openly and honestly. Students felt the learning community developed as personal relationships reached a level of kinship as family or friends. This social connection was possible through feeling a common bond as being dental hygienists and graduate students, having common goals and juggling many roles. A network of learners was formed when students felt competence in the online learning environment and established a professional identity that allowed them to contribute to learning. One contribution was guiding and mentoring that occurred among the students to help each other be successful in the coursework. Students who lacked practical dental hygiene experience were viewed as not contributing to the learning community, possibly due to the lack of establishing a professional identity. For

this reason, program administrators should decide whether clinical experience should be a requirement for admission to a graduate dental hygiene program.

Peers developed a supportive network through back channel communication. This form of communication is an informal means of connecting with each other outside of the formal course technologies to construct social presence.³⁵ The technologies used for back channel communication mirrored those the dental hygiene participants identified: personal telephone calls, email, Skype and social networking sites. Additional technologies reported by at least 50% of the students were blogging, texting on cellular telephones, using RSS feed readers and use of websites for collaborative authoring and editing.³⁵ Peers communicated with each other to receive help with course assignments and technology difficulties, and provide social interaction and emotional encouragement.³⁵

Some experiences with peers negatively impacted the cognitive presence to develop higher levels of learning and community development.¹⁰ Peers who contributed poorly by late, minimal or insensitive postings in discussions provided challenges to the learning environment. These challenges should be addressed in the design of the course to prevent or at least minimize their occurrence.

Course design was the third category of experiences revealed as important to developing online learning communities. The formal weekly discussions provided opportunities for students to interact with each other. The use of small groups fostered collaboration without requiring large numbers of postings. Changing the membership of group members was deemed important to work with everyone in the course over the semester. Large group discussions were viewed as overwhelming. One explanation is the focus on quantity of postings over the quality of postings. Students preferred thought provoking discussions that required higher level cognitive functioning including analyzing, synthesizing and creating. These activities stimulated a sharing of ideas that enriched the learning experience and established a cognitive presence.

Parameters for the formal discussions were important to set in order to help students understand the expectations for their participation related to the quantity and quality of postings. Ground rules for establishing a cognitive and social presence in an online course are important.³⁶ The rules for cognitive presence include deadlines for the initial

posting and the end of the discussion timeframe, quantity and quality of postings, and the number of individuals with whom to interact.³⁶ Expectations for each online course can be articulated in a rubric within the course syllabus. Each rule of cognitive presence can be one criterion on the rubric. The evaluation of students' performance in the weekly discussions should be used as the computation of a participation grade for the course. The rules for social presence encompass providing a safe environment for taking risks, fostering a relaxed environment, and promoting a supportive and collegial environment where individuals can disagree and ask questions.³⁶ Furthermore, informal communication within the online course is important for developing and maintaining a social connection among students and faculty.

Group activities and assignments contributed to building community when each member equally contributed to the effort with high standards of performance. These activities impeded community development when group members' responsibilities were unequal or standards of performance were lower than the other group members. Another challenge to group requirements was different time zones that made working together difficult.

As faculty design online courses, they need to be mindful of providing ongoing opportunities for learners to interact with the course content and among each other to learn. Use of group activities and assignments must be carefully planned to foster the development of critical thinking through cognitive presence.¹⁰ Peer review is a learning strategy where students can support each other by providing constructive feedback on each other's work. This small group activity helps build learning communities as learners support each other in their coursework.

The fourth category of factors related to faculty who taught the online courses. Students felt faculty were members of the online community and had a significant role in developing the community. Their role was viewed as having a presence in the course to provide support for the content (i.e. cognitive presence) and building relationships (i.e. social presence). Faculty who understood online teaching principles and adults learning principles influenced learning in a positive way, whereas those individuals who were not prepared to teach in an online environment and were not familiar with the technology impeded the development of the community. Students did not feel supported when faculty failed to interact with them on a regular basis, initiated poor postings, and failed to provide feedback and fulfill the role as mentor and facilitator.

One significant finding related to the absence of faculty presence was that a strong learning community comprised of graduate students can direct and support their own learning in a course.

The results of this study confirm the interrelatedness of social presence, teaching presence and cognitive presence established by the Garrison et al framework.¹⁰ However, this analysis established course design and faculty as 2 separate entities that influenced students' experiences with building and sustaining online learning communities. In addition, learners were deemed a key element in the online environment. This finding is supported by recent evidence that adds an additional component to the original Community of Inquiry framework, namely a learning presence.³⁷ Learning presence refers to the control students have over their thoughts, behaviors, motivations, emotions and strategies to be effective in the online environment.³⁷ When considering a learner-centered approach to teaching, it seems plausible to have learners as an essential element in the development and sustainability of online learning communities and the construction of knowledge.

The limitations of this inquiry include the case study of 1 graduate dental hygiene program, an all-female sample and a small number of participants. Future research might investigate other online graduate dental hygiene programs and those with no campus visitations to determine how the students develop and sustain learning communities. It might be interesting to investigate if degree completion students enrolled in an online program have similar experiences.

Conclusion

Learning communities in an online graduate program were created and maintained by the complex interaction among experiences with the program and course design, and interaction among faculty and learners. The most influential feature of program design was the week long on-campus visit required for orientation and the second graduate seminar visit. Important aspects of course design were weekly discussions and collaborative activities that implemented social constructivism where students were actively engaged in learning. Communication via small groups was preferred as well as opportunities for informal conversation. Faculty interaction with learners on a regular basis was vital to guide, direct and extend knowledge construction. Learner interaction displaying sensitive, honest and respectful communication helped establish a strong network of interconnected learners supportive of each other. Furthermore, establishing

commonality was important for creating a personal and professional identity to develop social presence. In a learner-centered online environment, learners' actions, values and commitment are essential to the success and effectiveness of learning communities and knowledge construction.

A learning community is a complex network of interconnected people who create positive energy through synergy. Synergy can be generated to facilitate higher levels of learning, greater than the sum of the individuals in the community, when members rely on each other for motivation and learning, and value the investment in building relationships and knowledge together.

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