

## E-Model for Online Learning Communities

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### Abstract

**Purpose:** The purpose of this study was to explore the students' perspectives on the phenomenon of online learning communities while enrolled in a graduate dental hygiene program.

**Methods:** A qualitative case study method was designed to investigate the learners' experiences with communities in an online environment. A cross-sectional purposive sampling method was used. Interviews were the data collection method. As the original data were being analyzed, the researchers noted a pattern evolved indicating the phenomenon developed in stages. The data were re-analyzed and validated by 2 member checks.

**Results:** The participants' experiences revealed an e-model consisting of 3 stages of formal learning community development as core courses in the curriculum were completed and 1 stage related to transmuting the community to an informal entity as students experienced the independent coursework in the program. The development of the formal learning communities followed 3 stages: Building a Foundation for the Learning Community, Building a Supportive Network within the Learning Community and Investing in the Community to Enhance Learning. The last stage, Transforming the Learning Community, signaled a transition to an informal network of learners. The e-model was represented by 3 key elements: metamorphosis of relationships, metamorphosis through the affective domain and metamorphosis through the cognitive domain, with the most influential element being the affective development.

**Conclusion:** The e-model describes a 4 stage process through which learners experience a metamorphosis in their affective, relationship and cognitive development. Synergistic learning was possible based on the interaction between synergistic relationships and affective actions.

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

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### INTRODUCTION

Online learning is an increasingly prevailing method of delivering higher education, especially among nontraditional students and graduate level students.<sup>1,2</sup> Asynchronous learning offers many benefits to students who are trying to increase their educational levels while fulfilling employment or family responsibilities.<sup>1</sup> Benefits stem from the flexibility to accommodate the student's schedule with completing assignments, viewing instructional materials and communicating with peers or instructors on discussion boards.<sup>3</sup> To decrease the feeling of isolation that can occur with asynchronous learning, some educators teaching in online formats have found it worthwhile for learners to develop a sense of community to enhance the educational experience.<sup>4</sup>

A learning community can be described as a group of learners who participate in communication and collaborate with their peers and faculty, for the purpose of learning from one another.<sup>5</sup> According to Rogo and Portillo, an online learning community is more than just learning in an online format; it is a "complex

synergistic network of interconnected people who create positive energy."<sup>6</sup> This network focuses on relationships among learners who value each other and are committed to a shared vision to work together to provide a healthy exchange of ideas and create new ideas in a safe environment.<sup>6</sup> Community develops through social interaction between students and with faculty who actively engage in the course content.<sup>6</sup>

Online learning opportunities in higher education have evolved from individual course offerings to entire degree programs. However, research has continued to focus on the development of learning communities in a single course during 1 semester. Liu and colleagues suggested that building learning communities is a "complex sociocultural phenomenon" requiring a longitudinal focus to determine the development of this phenomenon over time.<sup>7</sup> Therefore, the literature reviewed was focused on the phenomenon of online learning communities over the course of an academic program or a cross-sectional approach to data collection using multiple levels of

students enrolled in a program. This approach to the literature review was deemed appropriate to establish a holistic perspective of the phenomenon.

Brown was a pioneer in studying the process of community building by conducting a qualitative study using novice and experienced online learners enrolled in a graduate program to inform the development of a grounded theory.<sup>8</sup> A 3-stage process for community development was created from the data analysis.<sup>8</sup> The first stage of this phenomenon was experienced as students met each other within the online course. Some students developed friendships based on finding commonalities in aspects of their lives such as their backgrounds, circumstances and personal characteristics. These friendships influenced active communication with each other throughout a course. The second stage was characterized as being accepted as a member of the learning community. Membership was earned by making contributions to the threaded discussions and peers building on those ideas. Students felt a sense of satisfaction and having a relationship among students who participated in the discussion. This membership increased self-confidence, especially in those students who were at the novice level of online learning. Expert learners who were "community-minded" facilitated the novice students' development through modeling positive interaction and providing support.<sup>8</sup>

The third and highest stage of community development was establishing camaraderie by making interaction a priority within courses.<sup>8</sup> Students who experienced this level generally had ongoing personal contact through intense interaction in one course, communication outside of the online course, enrollment in several courses together and/or interaction during a face-to-face summer session.<sup>8</sup> Informal communication was an important aspect of promoting camaraderie and building friendships.<sup>8,9</sup> The benefits of students' interaction in multiple courses reflects their ability to develop a shared common language and the ability to apply what they learned from the various coursework.<sup>2</sup>

The existence of long term relationships during an academic program is valuable in developing a sense of community. Students who had prior interaction in online courses or interaction outside of the academic environment were more likely to support each other academically and emotionally.<sup>7</sup> Emotional factors such as feeling alone, fear, overwhelmed and anonymous negatively influenced the development of a sense of community in an online program.<sup>9</sup> In comparison, structural and process factors influenced the building of community in a positive manner.<sup>9</sup> Structure refers to the design of the course related to the mandatory participation in collaborative activities and the students' sense of contribution to the group work.<sup>9</sup> Structural factors need to be es-

tablished before students focus on connecting with peers to develop interpersonal relationships.<sup>2,8</sup> Novice students spend more time conquering the structural challenges than on interacting with peers to build community; whereas, expert students devoted more time engaging with peers because they are already familiar with the precursor factors.<sup>8</sup>

Process factors also are important for developing community and are defined as actions strengthening the level of interaction by fostering student "confidence, motivation and learning."<sup>9</sup> The most important of these factors is the socialization process of becoming a self-directed learner and the progression from a novice to an expert online learner, thus enhancing students' confidence and self-efficacy.<sup>9</sup> Learning the rules of communication, including online etiquette, is part of creating a sense of community.<sup>9</sup> The process of accepting the "diversity of cyberculture" made up of students with common and dissimilar backgrounds is another important factor.<sup>9</sup>

Interaction facilitated the sense of community, as students and faculty engaged in shared discussions in the course. Formal interaction built connection, trust, self-confidence and learning among students.<sup>9</sup> Gaining trust and respect in the online environment was achieved through continual effort among participants as they assessed each other's strengths and ongoing support.<sup>2,8</sup> The development of community was fostered by community-minded students who made the online course a priority as evidenced by their active engagement in the discussions, respect for others, motivation and proclivity to know other students and to learn from each other.<sup>8</sup> Therefore, these students felt a connection to the community which in turn enhanced the level of community development and likewise, the higher level of community development influenced the students' connectedness.<sup>8</sup>

The purpose of this study was to explore the student perspective on the ebb and flow of learning communities in a graduate dental hygiene program. Educators who taught in the program noticed the development of community among many of the learners and thought it would be beneficial to examine the students' experiences of how this phenomenon occurred throughout the program.

## METHODS AND MATERIALS

A qualitative case study method was designed to investigate the experiences of learners with communities in an online environment. The context for this case study was an online graduate program located in a northwestern U.S. university which awards a Master in Science degree in Dental Hygiene. Students attended a week-long on-campus orientation before beginning the core courses related to program devel-

opment and evaluation, special needs populations, leadership strategies, research and advanced dental hygiene theory. The program requirements included the selection of a specialty in dental hygiene education or community health. Each specialty area consisted of 2 didactic courses, 1 elective course and a practicum. A second week of face-to-face interaction on-campus was required for a seminar course with topics relating to practice, education and research. Students enrolled in the seminar to prepare for the research course and the subsequent thesis experience. All core courses and emphasis area courses were provided using an asynchronous format to accommodate the different time zones in which students lived.

The university's Internal Review Board approved the research protocol before participants were recruited. The purposive sampling method was employed to gain students representing a cross-section of progression in the program who were experiencing the phenomenon at different levels, as well as graduates who would be able to provide a retrospective view of the phenomenon. Personal interviews were conducted by a graduate of the Master's degree program after participants signed the informed consent form and selected a pseudonym to protect their confidentiality and anonymity. Participants received a copy of the interview questions 1 week before the in-person or telephone semi-structured interview. The audio data from the interview were recorded, transcribed and verified for accuracy before the second researcher analyzed the data.

The data were collected for the original purpose to determine the factors promoting and impeding the development and sustainability of online learning communities throughout the graduate program.<sup>6</sup> However, as these data were being analyzed, the researchers noted a pattern that evolved indicating the phenomenon developed in stages. As a result, all 17 of the transcripts were reanalyzed with the new purpose in mind. The first round of data analysis was conducted by deconstructing the data into initial codes representing the actions apparent in the data.<sup>10</sup> Initial codes were provisional, as a place to begin the analysis.<sup>10</sup> Open codes have the potential to change as the researcher uses the constant comparative method to determine similarities and differences in the data collected from multiple participants.<sup>10</sup> Therefore, each interview was analyzed and initial codes were compared to those established during the analysis of the other interviews.

The second round of data analysis and focused coding allowed the analysis to create conceptual categories that represented multiple open codes.<sup>10</sup> Throughout this process, the researcher wrote memos to raise questions about the analysis and relationships among the categories. The interviewer served

as a peer reviewer to help answer the questions raised and determine relationships based on her experience in the program. In the third and final round of data analysis, the researcher focused on the relationships among the categories.<sup>10</sup> This relational analysis resulted in organizing the data into categories named as stages of online learning communities, subcategories reflecting supportive themes in each category and actions participants experienced in each subcategory.

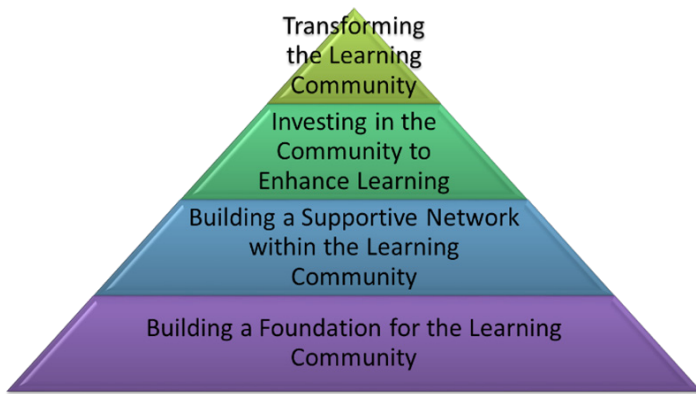
After the data analysis was completed, the results were written and a figure of the model developed, the validity of the analysis was verified by conducting member checks. Ten participants completed a review of this information to ensure the credibility of the researcher's interpretation of their experiences. In addition, 2 students who were in the online program, but not participants in the original study, were asked to read the results and provide feedback comparing their experiences in the program to the data analysis. Some comments made by the individuals about the fourth stage of the e-model from the first round of analysis caused the researchers to re-analyze the transcripts related to this final phase and develop a more accurate interpretation of the participants' experiences. A second member check was completed by current MS students who had completed 1 year of the program and graduates to provide feedback on the revised e-model. Nine individuals responded to the revisions in a positive manner and no additional changes were made to the analysis.

## RESULTS

The participants lived in all regions of the U.S. (n=17). The entire sample was female; 2 students were in the first year of the program, 6 students comprised the second year level, 4 students from the third year level and 5 participants had graduated from the program.

The analysis of the qualitative data collected from the participants revealed 4 stages of online learning communities throughout the graduate program. Participants progressed through 3 stages of formal learning community development as they completed the core courses in the curriculum and 1 stage related to transmuting the community to an informal entity as students experienced the independent coursework in the program. The development of the formal learning communities followed 3 stages: Stage 1: Building a Foundation for the Learning Community, Stage 2: Building a Supportive Network within the Learning Community and Stage 3: Investing in the Community to Enhance Learning (Figure 1). The last stage was Stage 4: Transforming the Learning Community, which signaled a transition to an informal network of learners.

Figure 1: E-Model of Learning Communities



The first stage of community development, Building a Foundation for the Learning Community, revealed 3 subcategories and actions to achieve each subcategory (Table I). The Initial Connection was the first subcategory of Stage 1. The actions experienced by participants consisted of meeting peers and faculty face-to-face at the on-campus orientation, sharing common experiences during the on-campus visit and connecting with new peers in courses throughout the program.

Ella explained the importance of the face-to-face connections made during the on-campus orientation: "Spending the week to get to know everybody was very helpful so when we got into the courses you could put names and faces together and personalities as well. That was the starting point and the key to the whole community and the whole program because it helped you feel connected. The beginning orientation was the start, it really got us off on the right foot." Not all students attended the same orientation; some met for the first time in an online course. When students interacted in that environment it was suggested that "It should be a requirement that you put your picture on the discussion.... so when your postings show up, you can see who it is you are talking to. I think that is important" (Tango). Getting to know new students sometimes took longer as discussed by Online RDH, "Initially there were a couple of people who I felt that they were abrasive or a know-it-all, but once I got to know them, I realized they were not trying to be disrespectful. It did take longer by having not met them face-to-face and personally." Katy's perspective on becoming familiar with peers was, "We were figuring out personalities and after a while you knew who would write a book for each posting, who was the minimalist, who was the aggressive personality and who was the nurturer of the group. I liked this aspect because it was similar to a face-to-face group."

The second subcategory of Stage 1, Awareness of Online Learning Challenges, related to online communication, time commitment for course activities

Table I: Subcategories and Actions of Stage 1 Building a Foundation for the Learning Community

Subcategories	Actions
Initial Connection	Meeting peers and faculty face-to-face at the on-campus orientation
	Connecting with new peers in online courses
Awareness of Online Learning Challenges	Appreciating the challenges of online communication
	Understanding the time commitment for online education
Online Learning Culture Socialization	Recognizing the challenges of the asynchronous online format
	Learning shared norms of interaction
	Establishing self-imposed performance standards

and the asynchronous format. June lamented about the lack of visual cues when engaging in online communication, "The biggest problem with online communication is not having the body language and not being able to see how peers said something. For instance, you post something and it is interpreted different than the way you meant it." Sally shared her perspective of the time consuming nature of participating in the weekly discussions, "My challenge was being able to make postings and articulate the discussions without taking inordinate amount of time. I mean it took a lot of time even for a simple posting for me." The asynchronous format of course delivery presented other challenges as depicted by Katy, "When you post at the beginning of the week and another person doesn't post until Saturday, but it's due by Saturday night at 10 o'clock, then you are all stressed out because you want to respond, but is it going to be in time?"

The third subcategory of Stage 1 was Online Learning Culture Socialization. The actions experienced by participants included learning shared norms of interaction and establishing self-imposed performance standards in the online learning environment. Learning shared norms was possible during the program orientation, "The ground rules for communication and using the emoticons to help with what you say was stressed at the beginning and pretty much everyone follows those rules" (Ella). Another aspect of socialization involved the language used in the discussions as depicted by Patsy: "As time goes on, you learn the language of online communication." Furthermore, socialization included setting a collective standard for quality discussion postings was explained by Polly, "I don't think students in my class were very

comfortable doing one liner postings. When you are with your peers and you see they post in-depth, you feel motivated and an obligation or greater desire to post something in-depth as well. Reading those increased my desire to post and learn and post more.” Establishing a self-imposed standard for interaction was articulated by Sally, “I felt I had a responsibility to the group as a learning environment to contribute with quality.”

Stage 2 of developing the online community was Building a Supportive Network within the Learning Community. Three subcategories and corresponding actions were revealed from the interviews (Table II). Developing Interconnected Learner Relationships was the first subcategory of the second stage. Participants’ actions included being open to developing relationships, establishing commonality and developing feelings of closeness and caring.

One action related to building interconnections among learners was being open to developing relationships, “It is up to the individual to take advantage of those opportunities for interaction. I mean we all live in communities physically, but we never know our neighbors unless we do our part, unless we extend ourselves to learn from them and learn about them. The opportunities are there and it’s up to us” (April).

Informal activities during the on-campus orientation visit were recognized as contributing to establishing common experiences with peers, as Whiskey indicated, “The outside of school interaction where you play and perhaps be a little naughty. It separates the student personality from the real person personality, who we are professionally and who we are as a student and who we are when we are kicking back and walking around in our underwear. It was a good interaction. Especially that first visit because we were just getting into the program and you have a bunch of scared students and they’re telling their worries to each other.” Katy expressed her thoughts on commonality: “Everybody was interested in what everyone else was doing and everybody knew everyone understood teeth and 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 work things out together.”

Feelings of closeness were voiced by Sally, “I consider myself as a member of a family and from my perspective it was definitely as a class” and Tango discussed feelings of caring, “We were not afraid to be personal and to share experiences because we knew we were sharing them with people who cared.” These feelings of being connected were developed “by sending personal emails, making phone calls and by sharing, calling and asking how are you doing or

Table II: Subcategories and Actions of Stage 2 Building a Supportive Network within the Learning Community

Subcategories	Actions
Interconnected Learner Relationships	Being open to developing relationships
	Establishing commonality
	Developing feelings of closeness and caring
Network Support for Learners	Experiencing a safe learning environment
	Developing trust through positive interaction with peers and faculty
	Receiving support from peers
Fellowship	Developing competence in the online learning environment
	Being an individual contributor to community learning

sharing progress and asking about how your family was or how things were going” (Patsy).

The second subcategory of Stage 2, Network Support for Learners, related to the actions of experiencing a safe learning environment, developing trust through positive feedback from peers and faculty and receiving support from peers. A safe learning environment was conceptualized by Patsy, “The online community has to be a safe place where people can express their opinions” and Online RDH, “I never feel attacked ever in any way. Sometimes my opinions would be disputed, but it was always very professional and respectful.” A supportive network provided positive feedback as explained by Ella, “Good honest constructive feedback from both the instructor and peers probably is the most important thing in creating an environment that fosters learning.” Penelope expressed a growing dependence on the supportive network as time went on, “It’s just nice to get a pat on the back and say hey, you did good...I’m becoming more dependent on the community support than I was initially.” The peer network was a resource for receiving help with technical problems and questions about courses and receiving emotional support as portrayed from the following quotations:

Steel Magnolia: “When I had questions that I needed answered, most all the time it was another student who would jump in and help me or explain things to me before the teachers even got to me.”

Whiskey: “It’s nice having the community feel to the learning because truly they’re the only ones who know what you are going through. Your family can be supportive, but they don’t understand really what you are going through. They [peers] are the only

ones who can keep you going because they understand.”

The last subcategory of Stage 2 was Fellowship, as participants began to experience learning as being a member of the community through the actions of developing competence in the online environment and being an individual contributor to community learning. Steel Magnolia illustrated her progress from Stage 1 to Stage 2 whereby she developed competence, “It was a learning curve for me at first because I had to get in the flow of learning online classes, getting used to the postings and the discussions was something that took some time, but eventually grew and flushed it out so that I felt very comfortable and competent at it” and her experience being a contributor, “During the leadership class a lot of my experiences helped others. They were interested in some of the stuff I had been doing and it was beneficial to them. I felt like I really contributed to something to their experience.”

The third stage of online community development constructed from the data was Investing in the Community to Enhance Learning. This stage revealed 2 subcategories, Collaborative Interaction and Synergy Creation and 2 actions within each subcategory (Table III).

The first subcategory of Stage 3 was Collaborative Interaction. The actions experienced by participants were committing to community learning and actively learning from each other. Online RDH explained commitment, “An effective learning community involves people who are committed, who prepare by reading and reflectively thinking and then bringing their preparations and thoughts to the table for everybody’s discussion.” Bluthner elaborated further, “We try to apply ourselves to what we read in the previous post that can advance the topic” and “If you have a supportive online group, together we are working towards a similar mission. There is camaraderie and bonding in that and it provides a big source of motivation.” Actively learning from each other was discussed by Irma, “Part of this online program is the value or learning from your peers ... It was valuable to hear and learn about what people were doing versus just reading about it in a book.” Steel Magnolia’s perspective was, “The experience wouldn’t have been half as enriching without the other people and without the instructor ... When people help each other out and share their diverse knowledge that builds community. When they come from different backgrounds and give their input and experience, it broadens the experience for everyone.”

The second subcategory of Stage 3 revealed from the data was Synergy Creation. The first action in the synergy subcategory was developing a higher connection among peers from an interpersonal and

Table III: Subcategories and Actions of Stage 3 Investing in the Community to Enhance Learning

Subcategories	Actions
Collaborative Interaction	Committing to community learning
	Actively learning from each other
Synergy Creation	Developing a higher connection among peers
	Constructing knowledge as a community

intellectual perspective. Steel Magnolia shared her experience with developing stronger relationships, “I have been interacting with these people for over 2 years so they became a part of my life and are part of my graduate experience. We do develop a relationship even though it’s not a 1-on-1 or face-to-face one. We definitely, over time, build the relationship and it evolves.” Online RDH confirmed relationship building by stating, “We all got closer by the end of the core courses. Our relationships absolutely changed....Relationships definitely did grow and progress throughout the curriculum.” Whiskey shared her viewpoint, “Discussions are definitely less formal, but there is a higher connection. There has been growth intellectually [over the semesters] and our critical thinking is advanced for sure....It’s a sense of enlightenment.” The attainment of this level of community development was explained by Bluthner, “My definition of an online learning community is learners who are passionate about their profession and their educational journey, who also...value the peer learning process and providing a synergistic positive energy environment.”

A sense of constructing knowledge as a community was articulated by Polly “I felt we all learned things together. We all reaped the knowledge together and then we could share it with each other. We could discuss the new things we all learned together and bounce ideas off of those new ideas and share ideas from that new knowledge.” Bluthner added, “From the aspect of an individual learner, we each need to become active with the material, read it, analyze, synthesize and develop from that process ... As a community learner you can learn so much more after each person has shared what their perspective is or what they learned can be clarified and your perspective has been broadened. Deeper levels of understanding occur with community learning.” Polly explained further, “Peers influenced my learning when you had more in-depth postings where you get more information and ideas 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 it’s stim-

ulating too. When you are stimulated, it opens up your mind and you are motivated to learn more.” The concept of synergistic learning in the community was expressed by Sally, “All of the input from the individuals seemed like the group experience was overall greater than each person’s individual part. We created something unique.”

The last stage in the online graduate program was Transforming the Learning Community (Table IV). The final stage’s subcategories were Absence of the Formal Peer Network, Construction of an Informal Learning Community and Adaptation of the Informal Learning Community.

As students engaged in independent learning experiences in the practicum and thesis courses at the end of the graduate curriculum, the peer network formerly established during the completion of the core courses was absent. Students did not interact with peers on a regular basis and some students felt isolated. The lack of peer interaction was viewed as “It’s like you’re cut off from this group of friends. You miss the discussion boards. You miss getting online and having that connection once a week” (Patsy). The lack of a supportive network “lowered my motivation for learning because I don’t have others to connect with. You can’t support each other” (Polly). Isolation was articulated by Teeth Geek, “It does feel isolated at first and a little sad because what was initially scary when beginning the online program and learning so much in an unfamiliar format became the blossoming of new relationships and sharing wonderful learning experiences with a group of peers who uniquely understood because they were having similar wonderful experiences and celebrating those successes together. Then, suddenly being without them, this was a little hard to get used to.” However, Teeth Geek elaborated further as she reflected on this experience during a member check, “Because of the strength of the first 3 stages, I was able to use that synergy to get me through the initial ‘loneliness’ of the fourth stage and positively focus on the work at hand [in thesis].”

This feeling of isolation spurred some students to experience a Construction of an Informal Learning Community as they reconnected to peers through informal communication mechanisms as Katy indicated, “After I realized I wasn’t getting enough peer support, I started talking to several peers on the phone and communicating via email or Facebook.” Re-establishing a supportive network was evident from Pasty’s comment, “One person who was in thesis with me, we taught each other and we sat together on the phone across the United States.” June offered her perspective on a supportive peer network, “Hopefully you will have someone who’s also going through thesis and then you can help each other and encourage one another and support one another...”

Table IV: Subcategories and Actions of Stage 4 Transforming the Learning Community

Subcategories	Actions
Absence of the Formal Peer Network	Not interacting on a regular basis
	Feeling isolated
Construction of an Informal Learning Community	Reconnecting with peers through informal communication
	Re-establishing a support network
Adaptation of the Informal Learning Community	Struggling out of the chrysalis (Finding your wings)
	Maintaining lifelong relationships with peers and faculty
	Forming new learning communities

It is nice to be able to confide in one another and it would be great to stay connected with them. It’s important just to keep you motivated and help you realize there is a light at the end of the tunnel.”

The last subcategory of the final stage was Adaptation of the Informal Learning Community. Teeth Geek explained her experience with struggling out of the chrysalis, “I began to realize that thesis is a chance to give back to future generations and is an important step in becoming the kind of educator, researcher, professional and mentor who facilitated the great experiences you’ve had during your MSDH journey. It is necessary to ‘struggle out of the chrysalis’ needed to find your own wings.” Maintaining lifelong relationships with peers and faculty was evident as some peers continued to interact after graduation, “I did have the opportunity to run into several of my classmates [now graduated] at the ADHA national convention and sometimes I run into them at the national oral health conference” (Tango). Furthermore, new informal learning communities were created after graduation as experienced by Tango, “I definitely participate in public health listservs so I do read those and participate in those and of course I peek through my ADHA district listservs. So it’s a vast online community that I have.”

## DISCUSSION

The creation of the 4 stage e-model resulted from the inquiry of the online learning community phenomenon experienced by dental hygiene students in a graduate program using a cross-sectional approach to data collection. The data analysis revealed an e-model consisting of 3 stages representing a crescendo in the development of formal learning communities, while the last stage described the formation of informal learning communities and lifelong collegial relationships. Formal learning communities

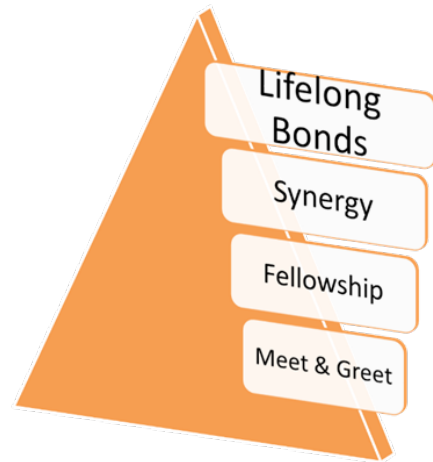
were created over the semester time frame in the core courses of the graduate program during the interaction required of learners in the weekly discussions or activities. Informal community development was necessary when learners progressed to the independent course experiences, practicum and thesis courses, in the graduate program and no longer participated in required weekly discussions. Informal communication through back channel means (e.g. telephone calls, email, social networking sites) was vital for re-establishing a supportive network within the program and beyond graduation.

The e-model extends the understanding of online learning communities as presented by Brown.<sup>8</sup> Stages 1 to 3 of the e-model are similar to Brown's stages of meeting, membership and camaraderie. The similar findings might indicate a need for prolonged, intense or face-to-face engagement among learners to reach higher levels of learning communities. Brown studied novice and veteran online learners who were enrolled in a graduate course during the fall, spring and summer sessions presented in an asynchronous fashion. However, participants in the e-model study represented a cross-section of progression in an entire graduate degree program and graduates who had a retrospective view of learning communities. In addition to the asynchronous core courses, the graduate program required 2 on-campus visits where students had the opportunity to connect face-to-face with peers and faculty. These differences might explain the development of Stage 4: Transforming the Learning Community, which adds an additional phase to understanding learning communities within an online graduate degree program.

The e-model was represented by 3 interrelated key elements over the course of the graduate degree program: metamorphosis of relationships, metamorphosis through the affective domain and metamorphosis through the cognitive domain. The developmental progression through each of the 3 key elements was necessary to reach the highest level of each key element.

Figure 2 depicts the hierarchy of relationships as students progressed through the graduate program. Each level represents a developmental change in the quality of relationships. At the simplest level, establishing the initial connection during the on-campus or online meet and greet laid the foundation for connecting to other learners in the community in Stage 1 of the e-model. During Stage 2, learners developed a close and caring relationship, which in turn created a network of interconnected learners portrayed by feeling safe, trust and support for each other. These experiences were important for the development of fellowship portrayed as a supportive network of equals. When learners evolved to the status of being an equal in the learning community this achievement

Figure 2: Key Element: Metamorphosis of Relationships



was influenced by their ability to overcome the challenges in the online environment, develop competency in becoming an online learner and participate as a valuable contributor to learning. The fellowship level of relationships is where students developed self-efficacy as an online learner and established an authentic connection with community members.

The highest level of relationship development within the formal learning community was the synergistic relationship revealed in Stage 3 of the e-model. This relationship involved the ability of the members to cooperate and collaborate based on the enhanced quality of the interconnected relationships developed through ongoing interaction in the core courses. Students involved in a synergistic relationship were united by working towards accomplishing a common goal and felt the freedom to share their insights for the benefit of the collective group. Synergistic relationships were characterized by the positive energy created by the interconnected learners. Lastly, lifelong bonds were characteristic of an informal learning community established in Stage 4 where peers and faculty formed collegial relationships that extended beyond graduation.

Social interaction is an important aspect of learning and is based on the social constructivist theory.<sup>11</sup> The constructivist model is applicable to traditional learning contexts and online situations.<sup>5</sup> Specific to online learning, social presence is one of the 3 key components of the Community of Inquiry model.<sup>12</sup> Social presence is created by conveying a sense of a real person through affectively expressing oneself, openly communicating and developing a group identity.<sup>12</sup> The e-model created from this current inquiry points to a developmental process of relationships, each stage building on the other, in a similar fashion as Brown's model.<sup>8</sup> Her level of "membership" characterized by reaching the status of being a contributor to the discussions and others building on



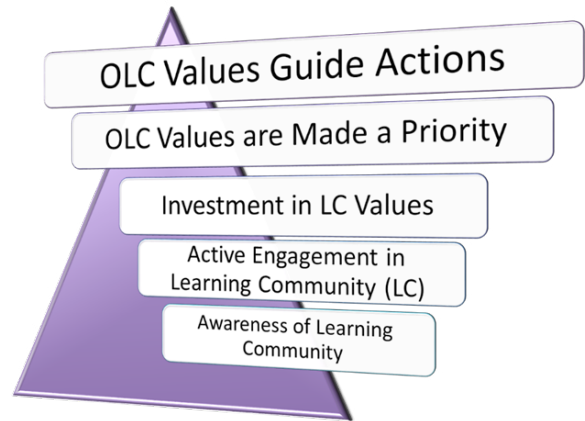
those ideas<sup>8</sup> is similar to the level of “fellowship” experienced by the dental hygiene graduate students. However, the e-model differs from Brown’s model, in that “camaraderie” through making interaction a priority was analyzed as an affective change in the learners’ values in the e-model. Synergistic relationships in the e-model had a strong affective dimension, which related to learners valuing each other, caring about and empathizing with their peers and providing encouragement to each other. Likewise, the positive energy created by synergistic relationships influenced the synergistic cognitive development of the community.

The literature on women’s learning supports the interconnectedness of relationships, affective development and cognitive development. The significance of relationships to females was first recognized by Gilligan’s research on the moral development of women. At the highest level of maturity, women had an ethic of care characterized by valuing the importance of interpersonal relationships based on collaboration and cooperation and being responsible and sensitive to others.<sup>13</sup> Belenky and associates built on Gilligan’s findings to explain “women’s ways of knowing.”<sup>14</sup> These researchers identified “connected knowing” as one way women learn.<sup>14</sup> Connected knowing is subjective because it requires the learner to empathize and share another person’s experiences, trusting what others are saying and learning from others’ perspectives.<sup>14</sup> This way of knowing requires an affective component of feeling connected to the learning.<sup>14</sup> Participation in discussions and collaboration in the online learning environment nurture the use of connected knowing within the learning community.<sup>15</sup>

More recently, social capital and supportive networks have been identified as important factors for women’s learning. According to social capital theory, social networks are viewed as investments in relationships.<sup>16</sup> This investment can be considered capital to earn a profit, which can be redeemed at a future time to advance any individual’s interests who participated in the relationship.<sup>16</sup> Learner relationships within networks are built on collaboration, trust, mutual respect, shared values and shared norms.<sup>16</sup> Social capital built on supportive networks is used to improve student success in graduate programs.<sup>17</sup> Interaction with peers and faculty within a graduate program provide formal and informal network systems. These systems provide an opportunity for academic and emotional support as students share a common purpose of earning the graduate degree.<sup>17</sup>

Emotional support within the online learning environment was revealed as an important factor in the development of relationships in the e-model. Within the online context `emotions can affect the learner in a positive or negative manner.<sup>18-20</sup> Emotions have

Figure 3: Metamorphosis through the Affective Domain<sup>24</sup>



been reported in each presence within the Community of Inquiry Model: social, cognitive and teaching.<sup>21</sup> More recently the emotional component has been proposed as a separate entity from the other presences; thereby, adding a fourth presence to the Community of Inquiry Model.<sup>22,23</sup> In comparison and in addition to emotions and feelings, the e-model exposed a developmental change in values, priorities and actions guided by an internal values system within the affective domain.

The second interrelated key element in the e-model consists of the metamorphosis through the affective domain of online learning communities (Figure 3). Krathwohl et al created a hierarchy of emotions, values and beliefs, from the simplest level to the most complex.<sup>24</sup> The simplest level, receiving a phenomenon, was revealed as the novice graduate students engaged in online activities and developed an awareness of the learning community phenomenon by interacting with peers and faculty. This level also involved becoming conscious of the online culture and its rules of communication and standards of performance. Students entered the next level of the affective domain, responding to the phenomenon,<sup>24</sup> when they actively engaged in the learning community by applying the cultural norms, being open to developing relationships and being satisfied with their contributions to learning. Valuing the phenomenon, the third level of affective development,<sup>24</sup> was evidenced by students attaching a worth to the online community, demonstrating a belief that collaborative learning was important and committing to the community as an investment in their learning. Furthermore, the valuing level was important for believing that peers’ and faculty’s diverse experiences provided enriched opportunities for learning beyond the knowledge gained from textbooks. A community placing value on commitment enhanced motivation of its members.

The fourth level in the affective domain required

students to organize values into priorities and create a unique values system.<sup>24</sup> Prioritization involved spending time and effort in preparation for in-depth postings and collaborative interaction. The unique values system related to the emphasis on synergistic learning, which inspired and aroused excitement in the enhanced status of learning achieved by the community. Characterization was the most complex level of emotions, values and beliefs requiring students to internalize the value of a phenomenon, thereby guiding their actions.<sup>24</sup> Internalization of the value of the formal learning community directed the learners' actions to establish informal learning communities when they felt isolated during the independent learning courses in the graduate degree program. The students' ability to establish and adapt to an informal community resulted from their feelings of being comfortable, competent and stimulated from the collaborative learning that occurred in the formal communities. It seems likely that the learners' previous experience was positive and they desired to continue these values and emotions in new situations.

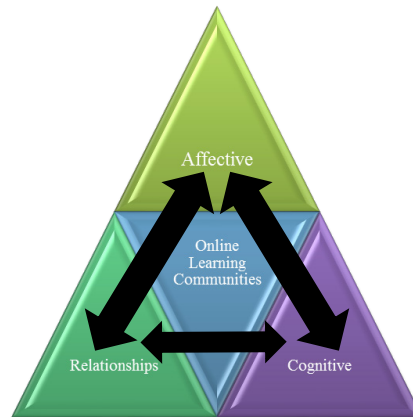
The third interrelated key element of learning communities was the metamorphosis through the cognitive domain (Figure 4). The hierarchy of knowledge shown in the figure was originally developed by Bloom and colleagues in 1956 and was revised in 2001 by Anderson and Krathwohl.<sup>25</sup> The simplest level of cognitive domain involves remembering information; whereas, the creating level requires the most complex functioning.<sup>25</sup> The core courses of the graduate program focused student outcomes at the analyzing, evaluating and creating levels. During the pinnacle experiences of the learning communities in these courses, synergistic learning was apparent, which coincided with the creating level. Synergistic learning was experienced as the creation of innovative knowledge unique to a collaborative group. This knowledge was built from intensive interaction of the group to outperform the sum of abilities of each individual member. Synergistic learning was the positive energy stimulating the collective construction of ideas both quantitatively and qualitatively. This learning enhanced the level of student performance based on the interaction with synergistic relationships and affective actions.

The concept of synergistic learning is supported by Zhu and colleagues who proposed a synergistic learning model as a new framework to explain learning in a technology-based system.<sup>26</sup> This learning was characterized by "deep interaction between content and learners," information sharing, collaborative and cooperative construction of knowledge and "collective thinking."<sup>26</sup> Within the technology system, the interaction of 5 fields comprises the learning field: information, knowledge, behavior, emotion and value.<sup>26</sup> It is interesting to note the separation of

Figure 4: Metamorphosis through the Cognitive Domain



Figure 5: The Interrelationship Among the 3 Key Elements



the emotion from the value field and the inclusion of both within the process of synergistic learning, which corroborates the findings related to the e-model.

The 3 key elements of online learning communities are: metamorphosis of relationships, metamorphosis through the affective domain and metamorphosis through the cognitive domain. These were interrelated based on the experiences of students enrolled in an online graduate program. Each element was mutually related to the other 2 elements as shown in Figure 5. Students who reached the higher levels of each hierarchy experienced a relative developmental change in the other hierarchies. Perhaps the most significant finding was the essential role the affective domain had in influencing the metamorphosis of relationships and the cognitive domain.

This qualitative inquiry on the phenomenon of online learning communities over the length of a graduate degree program adds an e-model to the scientific body of knowledge in dental hygiene education. The e-model describes a 4 stage process through which

learners experience a metamorphosis in their affective, relationship and cognitive development.

Students' experiences in Stage 1: Building a Foundation for the Learning Community, provided the groundwork for learners to progress to Stage 2: Building a Supportive Network within the Learning Community. Advancement to Stage 3: Investing in the Learning Community was facilitated by the experiences in Stage 2. The final stage was Transforming the Learning Community to an informal network of colleagues as students completed the curriculum and focused on their personal professional development and anticipated careers. The e-model represents the ultimate experience with learning communities in a graduate program. Learners advanced through the stages at different rates; however, it was difficult for students who remained independent learners to progress to Stage 3 and 4 as they did not value being open to building relationships and creating knowledge as a collective community.

The most influential key element contributing to the learners' evolution through the e-model was the affective component. The affective development generated informal learning communities from the value of formal learning communities. Lifelong collegial relationships extending beyond the academic program were formed. Synergistic learning in the cognitive element was possible based on the interaction between synergistic relationships and affective actions.

Although the e-model and 3 key elements of online learning communities is based on female graduate students from one dental hygiene program, the findings provide a foundation on which future investigations can be based. The importance of continuing this line of investigation is paramount as distance

education links the global dental hygiene community during the pursuit of master and doctoral degrees. Furthermore, Lock suggested that educators need to examine this phenomenon in a broader context, beyond the academic institutional setting to the global community of professional associations and "professional thinking."<sup>27</sup>

## CONCLUSION

Online graduate programs present many challenges to students; however, engaging in formal and informal learning communities provide the means to being productive learners. Students struggle through their coursework, but when they have the support of learning communities and develop competence and confidence navigating these challenges, they can be successful. Learning communities are similar to the chrysalis in which the butterfly develops fully surrounded by a supportive structure. The butterfly must struggle out of the confining chrysalis as a necessary process to build strength in its wings in order to fly. Learners also must struggle to emerge from the chrysalis, to strengthen their wings to fly and to begin new lives as independent, self-motivated and self-sufficient professionals.

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## DISCLOSURE

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