Classrooms as Communities of Practice: Designing and Facilitating Learning in a Networked Environment

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Abstract
Learning is a continuing social action that takes place through interactions with the environment and other individuals. Forming communities of practice provides participants with an environment that combines knowledge and practice and the opportunity to learn through relationships with their peers and practitioners in the community. This study explores the classroom as a community of practice and examines the role classroom activities have in students’ collaborative learning. The study uses a graduate-level public administration course as the case. The classroom activities in this course were designed to enhance peer interaction in the classroom and to facilitate learning by balancing theory and practice. The results of two separate surveys indicate that providing environments that blend practice with classroom knowledge lead to highly positive outcomes. Activities that foster peer interaction result in a dramatic increase in friendship relations between students while leading to only a slight increase in the advice network between students. One reason for this result might be the group projects, which create a silo effect on students and limit their work relationships with peers.

Learning is not merely a function of individual efforts to obtain information and knowledge from the outside and absorb it. Nor is it bounded with a concrete start and end. Instead, learning is a social process taking place within the context of our daily actions and experiences (Smith 2003, 2009).

In higher education programs and classes, students are encouraged to form and work in groups, complete their assignments through a team effort, work with the community partners of their universities, and interact with each other for other class activities. Higher education programs, in a sense, are training venues preparing students to be “reflective practitioners” with the skills to
solve complex problems (Bok, 1986; Schon, 1987). Collaborative learning, active learning, and experiential learning are not new to public affairs and administration programs. Several articles have been published in the Journal of Public Affairs Education pertaining to these subjects (Bushouse & Morrison, 2001; Guldberg & Pilkington, 2006; Kapucu, Arslan, Yuldashev, & Demiroz, 2010; Koliba, 2004; Neubauer, Hug, Kamon, & Stewart, 2011; Weimer, 2002). Collaborative learning is understood as the active participation of students in the learning process instead of being passive absorbers of the information provided. Students can become an active part of the learning process by applying what they learn in the classroom through working with other peers and practitioners in their community (Arum and Roksa, 2011; Kapucu et al., 2010; Neubauer et al., 2011). The trend toward collaborative learning practices requires greater attention to its theoretical underpinnings and the measurement of its effectiveness.

Learning (teaching from another perspective) through interaction with peers has been an important tool in higher education (Kapucu et al., 2010). Bringing individuals together and forming communities of practice is an important tenet of learning, and learning patterns within a community are particularly important because most of the learning occurs due to human practice and interaction with others. Communities of practice acts as a catalyst for students to internalize the knowledge they are exposed to and allows them to reach different interpretations of the same knowledge. Similarly, Guldberg (2010) examines “how students talked with other students about their practice and how they constructed meaning, using what they were learning within this learning community to apply to their work based communities” (p. 171).

This study considers the classroom environment as a community and analyzes learning tools from the standpoint of communities of practice (Koliba, 2004). Communities of practice are formed by people of similar concerns or interests with the aim of addressing these concerns, solving problems, or improving their performance with regular interaction. Communities of practice assume that students’ engagement in their social lives is the fundamental process by which they learn in professional degree programs (Bok, 1986). The article focuses on engaging students and the collaboration in well-structured contexts that focus on student learning and activities in courses designed with this expectation in mind. While discussing collaborative learning within communities of practice, the study examines course activities designed to increase student interactions and for learning in a graduate-level course. Key questions of this research are as follows: How does relationship building affect student learning in communities of practice? How do different types of assignments and class activities affect learning? How can we develop more effective, informative, and instructive learning assignments?
LITERATURE REVIEW AND BACKGROUND

The importance of relationships and networks in education has been discussed in literature. John Dewey, for example, emphasized that education/learning can occur only in the context of engaged networks and relationships. He sees communication as a major educational activity by nature (1963, 1966). Connectedness is also seen as an important part of good teaching and learning practice (Cross, 1981; Guldberg & Pilkington, 2006; Jones, 2004; Palmer, 2007). Besides traditional classroom environments, new information technologies are now available, such as social networking and online teaching platforms that can provide additional venues for teaching and learning as well as networking and relationship building among students, community members, and faculty (Rudestam & Schoenholtz-Read, 2010). These networks can play a significant role in disseminating knowledge among the participants of the communities of practice (Barabási, 2002; Downes, 2005; Guldberg & Pilkington, 2006; Kapucu et al., 2010; Siemens, 2004). Communities of practice, with the informal network characteristics of individuals in mind, can be intentionally designed and sustained (Barab, Kling, & Gray, 2004; Harlan, 2008). While the main tenets of communities of practice have been discussed and considered by scholars in various ways, certain characteristics stand out as the cornerstones of the concept. The following section discusses and emphasizes the usefulness of facilitative leadership for communities of practice and the role of collaboration. The section also discusses learning within communities of practice.

Facilitative Leadership for Communities of Practice

Before any community of practice can be created and functional, clear leadership should be established for the initiation and continuation of the process. The broad definitions and roles of a leader reflect facilitation and management of community activities (Jones, 2004; Polin, 2008; Wenger, 2000). Accordingly, the main role of a leader is to initiate, develop, manage, and monitor the community’s activities with the purpose of aligning them with overall community goals. In a sense, leadership is an integral part of ensuring the implementation of decision outcomes and community goals.

One characteristic of an effective leader is the ability to facilitate collaboration and teamwork and foster participation in the overall process, leading to an achievement of outcomes (Schwarz, 2002). Collaborative or shared leadership is especially critical when dealing with modern, complex problems and is important to consider as we prepare our graduates to deal with such problems in real life (Crosby & Bryson, 2005). If leaders are not firm believers of participatory decision making or are reluctant to adapt to ideas confronting their beliefs, communities of practice will not get beyond wishful thinking. In the specific example of a classroom environment, for the purposes of this article, the
professor is in the leadership position and plays the role of being a facilitator or inhibitor for the formation of communities of practice (Guldberg & Pilkington, 2006; Wenger, 2000; Shields, 2003).

Collaboration for Communities of Practice

If a facilitative leader, a professor in this case, succeeds in creating a community of practice, his or her role is to foster collaboration that ultimately will lead to learning. Collaboration, however, is primarily about the community participants’ level of belongingness in regards to the community. Wenger (2000, 2005) suggests that engagement, imagination, and alignment are the three pillars of belongingness for individuals regarding their environment. The author defines engagement as simply getting together with people, sharing experiences and knowledge, and doing something together. Imagination refers to attachment to broader images that people build up in their minds. For example, nation is a concept or image that individuals feel belongingness to, viewing it as a community of fellow citizens sharing some common grounds and values. This image of nation is built up in human minds as we imagine the round shape of our planet earth. Alignment, on the other hand, refers to working parallel to other processes such as peers’ efforts and engagement in collaborative relationships. It connotes a mutual alignment toward common goals as well as the separate processes of collaborating with partners. Wenger (2000) differentiates between these three pillars because each one requires a different style of work and attention. Overall, it is the extent to which a community member is engaged in collaborative practices that determines how well a community of practice is functioning.

Berardo’s (2011) study on the emerging field of scholarly networks highlights important points in regard to collaborative approaches in communities of practice. In his study, Berardo (2011) surveys participants of the Political Network Conference in 2008 and 2009 and identifies the change in coauthorship relationships between people. His findings indicate that an increasing number of scholars from dispersed backgrounds (e.g., sociology, public administration, and other subfields of political science) work together in the period following the conferences. Berardo (2011) concludes that this diverse group of people is forming a new and innovative community of scholarship. Members of this community interact with individuals from very different backgrounds, including computer scientists, social psychologists, statisticians, and philosophers. Berardo (2011) explains the benefits of this collaboration with a quote, by the American Society of Political Science, as “a better understanding of network theorizing and analysis across political science and to connect the study of networks in political science to other disciplines as well” (p. 74).

Communities of practice are increasingly interdisciplinary. Lazer, Mergel, and Friedman (2009) conducted a study similar to Berardo’s (2011) work
on scholarly networks. They identified co-citation patterns in the American Sociological Review and the American Journal of Sociology, two major journals in the field of sociology. Lazer and Friedman (2009) define co-citation as “a shared reference of two articles to a third source” (p. 44). The authors differentiate coauthorship and co-citation analysis and state that “while co-authorship networks reflect the structure of collaboration within a research community, co-citation networks reflect the structure of attention within a research community” (p. 45; emphasis in original). Their findings indicate changes in the patterns of citations and interests of research within the community of sociologists. They note that the citations for social network articles have dramatically increased (46% for social networks and 26% for non-network research) within last two decades. These network research citations include a number of important different disciplines and subfields such as physics and computational sociology. This study shows the emerging trend in the field of sociology is to collaborate with other disciplines, which leads to more innovative research and thoughts in social network analysis and sociology.

Learning in Communities of Practice

When collaboration takes place within a community, the most evident reflection of its effectiveness is learning. Wenger (2005) sees learning as “a fundamentally social phenomenon, reflecting our own deeply social nature as human beings capable of knowing” (p. 3). Wenger (2000) defines learning as “interplay between social competence and personal experience. It is a dynamic, two way relationship between people and social learning systems in which they participate” (p. 227). Wenger formulates this definition of learning from a social learning standpoint. Viskovic (2006) supports Wenger’s idea of mutual learning and states that learning can be formal (as in an educational setting) or informal (as in daily activities based on trial and error), emphasizing an unending process of inquiry. Thus learning is a process that has no identifiable start and end, and it develops through interaction with our environment. Lave (1991), in turn, considers learning as a nonsubjective process, oriented to the social world, through which individuals continuously develop their skills and establish their identity. This view specifically emphasizes the counterintuitive or subconscious element of learning through communities of practice.

Wenger’s (2005) social theory of learning (Figure 1) specifically emphasizes the process of learning based on the extent of social participation. That is to say, participants are involved in a community (belonging) to engage in certain activities (doing), thus establishing their identity (becoming) to interpret the world around themselves (experience). In a sense, the theory emphasizes a subconscious process of learning through participation with the purpose of substantiating and legitimizing individual actions.
In scholarly environments, learning and inquiry go hand in hand. The teaching methods of scholars are the reflections of the findings of their inquiries in bridging theory with practice in the classroom environment. In other words, the method of inquiry influences the teaching methods and tools of a scholar as well as student learning. The community of inquiry is a baseline for developing methods and analysis for solving problems. Shields (2003) notes several factors that are the driving force of communities of inquiry. First, problems are the mother of inquiry, and therefore, the communities of inquiry. She states that “a problematic situation is a catalyst that helps or causes community to form and it provides a reason to undertake inquiry” (Shields, 2003, p. 511). Second, a scientific attitude would arise from the synergy created by the community. Research methods, experimental and analytical reasoning, and the development of strong warrants are the tools needed to address the problematic situation. Third, interactions between community members, namely participatory democracy, help in facilitating the generation of new ideas and solutions. Democratic participation and relationships are particularly important in the field of public administration because the graduates of this discipline are expected to be representatives of democratic values in their realms. Participatory democracy includes values and ideals in the process of inquiry and aligns the goals and purposes of the community toward these values (Shields, 2003).

Communities of practice bear a critical role in educating public administrators. Inclusion of a democratic understanding of knowledge to the learning process helps melt down barriers between citizens and future public administrators. That
is to say, providing only pure technical expertise to students may create a class of experts versus citizens, whereas educating future public administrators with democratic values and aiming to create a soul for public service are the goals we should consider. A communities of practice perspective is also a good way to prepare students for public service (Bok, 1986). Stivers (2010, p. 256) highlights this point and says “broadening our own ways of knowing, and admitting qualitative, historical, philosophical, and critical research approaches to the list of approved models of social science” (emphasis in original) are the necessary actions to take in order to develop public administrators equipped with a public service conscience.

The educational setting of communities of practice described in this article presents an opportunity to discuss and internalize public service values through various tools presented and supervised by the instructors. The role of the instructor in this context, thus, is to consciously mobilize participants’ subconscious attitudes toward dealing with and brainstorming on the societal issues they are expected to tackle in the future. Such an approach, in turn, would lead to an understanding of collaborative and participative decision making.

Participatory decision making in a community requires the inclusion of all members and stakeholders of that community through a consensus-oriented, deliberative process of problem solving. An equal right of voice and balanced chance of influencing the decision-making process of members in a community is a viable part of the credibility needed in decision making (Johnston, Hicks, Nan, & Auer, 2010; Polin, 2008). A democratic mind-set cannot be injected into people in a hierarchical environment, but instead needs to be practiced in a naturally democratic environment (Stivers, 2010). To address this issue, classroom environments have to be designed for experiencing, understanding, and absorbing democratic behavior. Higher education institutions can prepare individuals by practicing democratic principles not only on campuses but also in communities (Benson, Harkavy, & Puckett, 2007; Brown & Witte, 2008). Students of public administration and public servants should learn how to collaborate with people rather than merely learning how to manage a contract. The role of experts is also critical when solving problems within a community. Expertise enables members of a community of inquiry to understand the issue more clearly and develop solutions based on a combination of analytical arguments and experience (Cross, 1981; Shields, 2003). To enable experts and public servants to favor democratic values and citizen thoughts, they have to learn and practice this mind-set before becoming professionals.

The main factors constituting communities of practice as stated earlier—facilitative leadership, collaboration, and learning—may be complemented by other elements. Wenger (2000) identifies several other elements for designing communities of practice: events, learning projects, and artifacts. Events are the attempts to bring community members together for common purposes such as meeting community needs. “Formal and informal meetings, problem-solving
sessions, or guest speakers” are some examples of events that Wenger identifies (2000, p. 231). Learning projects help communities of practice strengthen their commitment to their network and learning agenda, which helps them to engage in more sophisticated learning practices. Whereas artifacts are the common grounds or objects for community members such as documents, tools, websites, and symbols, communities of practice require additional skills for collective learning (Krackhardt, 1992; Wenger, 2000; Wenger & Snyder 2000). The work of community building needs to be acknowledged, and all members of the community should have access to the necessary resources needed to learn and be active participants of this effort.

To sum up, communities of practice, and specifically those of the educational environment, should aim to prepare community individuals for the realities of the social world. In a sense, they should be a bridge between formal learning and informal practice, thus creating more prepared and sophisticated citizens equipped with innovative and dynamic tools for problem solving. The cornerstone of the characteristics of such community individuals is their attachment to solution-oriented, collaborative, all-inclusive, and participatory environments as the arena for positive change.

ACTIVITIES AND ASSIGNMENTS FOR COMMUNITY OF PRACTICE

This study uses the classroom environment as an example of a community of practice. A master’s-level course on emergency and crisis management was developed and designed to enhance students’ understanding of these issues and build the analytical and practical skills needed to perform effectively in positions related to emergency management and homeland security. The focus of the delivery system of the class is interactive learning. Lectures, case presentations, practitioner guest speakers, group discussions, and presentations that actively involve students were included in the course. When possible and applicable, the processes of learning activities included comprehensive discussions not only on “what” was learned but also on the “so what” questions, which helped to complete the learning cycle. Course requirements included position papers, FEMA Emergency Management Institute Independent Study Courses (FEMA EMI IS), community-based service-learning research projects (term paper), presentations, and peer paper evaluations. A summary of relevant activities is provided next.

Network Management Article Assignment

Students are usually assigned to read an article on relationship/network building and management before they come to the first class. The importance of relationship building, investing in social capital, is emphasized in the first class and throughout the term. The current article used for this assignment
was written by Uzzi and Dunlap (2005) on how to manage your network. The assignment is used as a way to promote and provoke an understanding of network environments and its benefits, along with advice and suggestions for personal use. It is also employed as a method to awaken conscious and goal-oriented acts when developing personal relationships, rather than pursuing a random and purposeless set of interpersonal relationships. Communities of practice are and should be settings where established goals find realization through collaborative and networked relationships.

**Ice-Breaking Activities**

One of the most important factors to promote collaboration, and thus learning, within communities of practice is the all-inclusive ice-breaking activities that aim at establishing closer and denser relationships. Collaboration is generally impossible or unviable if community participants have distant relationships and know little about their peers. Ice-breaking activities specifically create an environment of better understanding and greater awareness of others’ goals and motives for participation. One such activity used in the course is the self-introduction of students to other peers, which requires every student to remember and repeat the names of the students who introduced themselves before him or her. Such an approach leads to better efforts to remember classmates’ names and encourages more interaction in the future. In addition, students are asked to introduce themselves on the web-based course system with a paragraph about themselves and their expectations from the course. Every student in the class is required to share an interesting or unusual fact about themselves in the introduction posting on the web-course system. This exercise provides a more striking picture about the students’ identity and helps establish a memory in a nonconventional way. Other students are expected to analyze these details and backgrounds about their peers and are asked to identify group members for their class projects. The formation of project groups is the next stage of ice-breaking activities, by which students establish relevance and try to find a midpoint based on class discussion to determine the term project goal. An occasional midterm or semester-end dinner with the whole class has also been an effective method for socializing and developing relationships with classmates during the semester. Lastly, the professor takes an approach that puts learning, as opposed to grading or testing, at the center of the course. Students are encouraged to participate in all activities with the single purpose of fostering learning through inclusion and participation. The main contribution of this set of activities to the notion of communities of practice is that participants break down the borders between each other, opening space for deliberate discussion of important issues. In this sense, little can be achieved before learners learn from others, and the best way to do so is to be involved in a deliberate interpersonal exchange of ideas, tools, and labor.
Course Graded Activities

Several graded activities and assignments are administered in class as well. Class participation is strongly encouraged as the main requirement for learning. Students are also asked to conduct a term-long service-learning project that focuses on a certain real-world case with the ultimate purpose of providing implementable results to the relevant agency studied or partnered with. A librarian usually visits during the second week of class to present resources available at the main university library. The provision of a paper proposal by the third week, a draft paper by the tenth week, and the final project by the last day of class are requirements that establish a viable monitoring mechanism and secure timely delivery of the projects. In addition, students are asked to prepare two position papers during two nonconsecutive weeks that are posted on Webcourses, an online web platform designed/adapted for UCF for online teaching and learning; these papers are expected to be read and commented on by all other students in the class. Position papers are also presented in class, which enables further classroom discussion. Furthermore, students are required to complete three FEMA Emergency Management Institute Independent Study Courses online, at the end of which they receive certificates of completion. At the end of the term, groups are required to present their study results in the classroom. Lastly, the group members are asked to evaluate their group peers’ work during the term, which secures fair and equitable academic conduct toward all group members. Overall, students are encouraged to communicate with the professor in regard to any class-related issue when and if needed for clarification or other supportive purposes. This set of activities is the main mobilizer or catalyst for collaboration in communities of practice within educational environments. Having a specific goal lets participants concentrate and stay focused on the central issue while developing a common solution through shared decision making and unified efforts.

Guest Lectures

The course also focuses on the importance of real-world examples. Practitioners from the emergency and crisis management field are invited to class for a discussion pertaining to their insights and firsthand experience. A common practice is that the professor provides a list of scholars or practitioners to students (some of which would attend by default) to obtain feedback about their preferences and interests. Students are also welcomed to provide suggestions of their own. The practitioners are then invited to the class to discuss the most relevant and up-to-date topics with students—a relatively informal and flexible classroom discussion environment, which is then followed by a question-and-answer segment. Including guest lecturers has been an effective way to promote nonconventional discussion in class supported by real-world examples. Specifically in terms of communities of practice, this approach presents an
opportunity to substantiate or supplement in-class activities and propositions with outsider expertise. This helps link the formal setting of education with the informal setting of practitioners, which eliminates the gaps in solutions developed in term projects.

Emergency Operations Center (EOC) Visits

Having close relationships with the community also presents an opportunity to visit settings related to emergency and crisis management. The Emergency Operations Centers (EOC) of Orange County as well as Orlando City have provided such an opportunity. Students are able to visit these centers with the purpose of gaining a better understanding of how governments respond in times of disasters. One class session is specifically allocated for this activity, during which the respective emergency manager/coordinator explains the structure, mechanisms, and operations of the EOCs and provides a tour of the facility. The EOC visits are an additional step to support in-class theoretical discussions with real-world practices. As with guest lectures, the visits help students realize the link between theoretical expectations and practical limitations. The main contribution, accordingly, is the strengthened view about reality that will find its reflections in the term projects.

Online Activities and Webcourses

As stated earlier, this class uses a mixed mode of teaching, namely both face-to-face and web-based. The web-based Webcourses system provides an opportunity for students to interact with their peers as well as with the instructor in regard to the course content, materials, and assignments. This interface allows for real-time chat discussions, posting of inter-peer discussions or announcements and reminders, and following individual and group progress. Students are also encouraged to use this system with the purpose of creating unified and coordinated teaching and monitored learning, thus preventing confusion, misunderstanding, or ambiguity on the students’ side. From the communities of practice perspective, this opportunity of additional exposure to interpersonal communication and collaboration shows the extent to which communities of practice can diversify and expand their venues for learning. In a sense, communities of practice of this type set a standard and model for problem-solving tools requiring alternative methods of dealing with the issues at hand.

Class-End Review Questions

The students are also encouraged to participate in a class-end discussion based on review questions provided by the instructor in each module online in Webcourses. Each PowerPoint presentation provided by the instructor ends with questions promoting critical thinking on issues of importance. This activity also serves as the summation of what has been discussed and learned in the class. The
connection between the previous class and that specific day’s topic is established, and key points about the next class are presented. The main purpose of this activity is to provide a more general and bird’s-eye-view synthesis in light of the class materials and real-world practices. It is an opportunity for brainstorming and creative thinking, which produce common decisions and unified action outside of the classroom. Communities of practice, in this regard, are settings for idea cultivation and diversification targeting all-inclusive solutions in the end.

Thus the overall literature pertaining to communities of practice and its important tenets reflects that a classroom environment is an example of a community of practice when appropriate activities and assignments are designed and facilitated by a professor who takes a leadership position. The professor is in charge of ensuring that activities and assignments designed and used for the course lead to collaborative and individual learning. Some activities and assignments will be more favorable for the communities of practice approach, while others will lead to limited collaborative learning.

**Method**

Data for this research comes from surveys administered in a classroom at the University of Central Florida (UCF). With more than 56,000 students, UCF has the second-largest student population in the nation. UCF Department of Public Administration has the largest Master of Public Administration (MPA) program in the state of Florida. The class or course in which the surveys were administered was a joint course for several programs in the Fall 2010 semester. It was a required course for the Emergency Management Certificate Program and an elective course for MPA, MNM (Master of Nonprofit Management), and PhD students.

Two surveys were conducted in a class with 29 students. The first survey aimed at capturing the structure and network of friendships and work relationships within the classroom and to see the change over time (see Appendix A). Students were asked to identify the individuals they see as their friends (friendship network), and the individuals they work/consult with (advice network). Two network surveys were administered, one at the beginning and another at the end of the semester. While only one student did not participate in the survey at the beginning of the semester, all students completed the survey at the end of the semester. UCINET social network analysis software was used for analyzing the data (Borgatti, Everett, & Freeman, 2002).

The second survey was administered only at the end of the semester. It aimed at revealing the perceived effectiveness of theoretical and practical learning materials, tools, and activities in actual learning environments (see Appendix B). The questionnaire included both open-ended and close-ended questions, and responses were measured on the Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). All 29 students participated in this survey. The close-ended
questions were analyzed in SPSS software. Both surveys were administered in the classroom. Students who were not able to attend the class were asked to fill out the questionnaire on a Microsoft Word document and send it via e-mail.

Students in the classroom were from various educational programs at different levels. There were students from the MPA program, the Emergency Management Certificate Program, the Master of Nonprofit Management program, and PhD degrees. Table 1 illustrates that most of the students were from the MPA program (19 students). Only seven students were from the EM Certificate Program. Two students were in both the EM certificate and MPA degrees (dual degree), and only one doctoral student was from the conservation biology program.

Table 1.
Frequency Distribution of Student Education Background

|               | Frequency | Percentage | Valid Percentage | Cumulative Percentage |
|---------------|-----------|------------|------------------|-----------------------|
| MPA           | 19        | 65.5       | 65.5             | 65.5                  |
| EM certificate| 7         | 24.1       | 24.1             | 89.7                  |
| PhD           | 1         | 3.4        | 3.4              | 93.1                  |
| Dual degree   | 2         | 6.9        | 6.9              | 100.0                 |
| Total         | 29        | 100.0      | 100.0            |                       |

FINDINGS AND DISCUSSION

This section discusses the findings of the two surveys conducted in class during the semester. The section also covers the network analysis that was performed to identify the structure and level of collaborative relationships among students who responded to the first survey at the beginning and end of the semester, and the qualitative analysis of responses provided by students to the second survey.

Network Analysis

The network analysis conducted focused on two dimensions—the friendship network and the advice network. The former is basically the extent to which students in class know each other and are friends, while the second implies the level of collaboration students are involved in. Two centrality measures, namely degree and closeness centrality, were analyzed for the purposes of this study. The degree centrality measure indicates the number of connections that a node has in a network, while closeness centrality measure indicates the distance of a node to others in the network. To put it simply, when the number of connections
increases, nodes have more alternatives and shorter paths to reach a random peer in a network. The results of the analysis are detailed next.

**Friendship Network**

Table 2 indicates the change of student interaction during the semester, in which only outgoing links were included. The average student link with his or her peers was 3.586 at the beginning of the semester and 6.069 at the end. This change in friendship connections in the network indicates an increase in classroom connectedness. The table shows that some students did not identify anyone in the classroom as their friends (however, these students are seen connected to other students in Figure 2 because of their incoming ties). The student with the maximum number of ties has identified nine individuals as his or her friends. Figures for the end of the semester indicate an increase in the number of connections for both the least and most connected students. At the end of the semester, students with the least outgoing connections had three friendship links as opposed to zero connections at the beginning of the semester. Students with the highest number of connections had 11 outgoing links to their peers as opposed to nine links at the beginning of the semester.

The closeness mean of the classroom was 9.865 at the beginning of the semester, and it was 44.212 when the semester was ending. This result shows a dramatic increase in students’ friendship connectedness and the ability to reach others through a significantly shorter distance.

![Table 2. Descriptive Statistics for Class Friendship Network](image)

Figures 2 and 3 illustrate the structure of friendship network relationships in the classroom. Figure 2 shows a number of weakly connected nodes. Some cliques also are visible between students. These islands of individuals refer to heterogeneous relationships within the classroom.
Figure 2.
Friendship Network at the Beginning of Semester

![Figure 2](image1)

Figure 3 depicts a more homogenously connected network where there are no weakly connected individuals in the classroom. The semester-ending network still has cliques; nevertheless, the level of connectedness has improved and students can reach others through shorter paths due to the relative homogeneity of the network.

Figure 3.
Friendship Network at the End of Semester

![Figure 3](image2)
Advice Network

Classroom advice (work) networks represent a relatively different nature from those of the friendship networks. Table 3 indicates a minor increase in the connectedness of students with respect to their collaboration. This is also observable in the closeness centrality measure of the overall network. There has been a very minor increase in the closeness of students to each other.

Table 3.
Descriptive Statistics for Class Advice Network

|                      | Beginning of the Semester | End of the Semester |
|----------------------|---------------------------|---------------------|
|                      | Degree | Closeness | Degree | Closeness |
| Std Dev              | 1.192  | 1.772     | Std Dev | 0.681  | 1.736 |
| Sum                  | 103.000 | 174.033   | Sum    | 120.000 | 178.066 |
| Variance             | 1.420  | 3.141     | Variance | 0.464  | 3.015 |
| Minimum              | 0.000  | 3.846     | Minimum | 3.000  | 3.994 |
| Maximum              | 5.000  | 8.408     | Maximum | 6.000  | 8.537 |

Figures 4 and 5 visualize the change of work relations within the classroom. The network includes six cliques that are weakly connected or not connected to others at all. Preestablished work relationships and the silo effect of study groups might be the main reason for this structure.

Figure 4.
Advice Network at the Beginning of Semester
Figure 5, on the other hand, illustrates a minor change in the network at the end of the semester. All the cliques are connected to each other via one or two nodes. Preestablished network structure has not been decomposed or reformed, but it is slightly more connected than it was at the beginning of the semester.

Table 4 indicates the descriptive statistics for the second survey. Students were asked to share their opinions about their learning experience in the classroom. The results indicate that most of the students agree that they learned about substantial issues and concepts of emergency and crisis management in this class. They also concur that networking and relationship building, which were emphasized in the class, are critical in their practical life. The effectiveness of class activities to develop relationship building and networking is perceived as mostly positive.
Table 4. 
*Descriptive Results*

|                                                                                       | N  | Min | Max | Mean | SD  |
|---------------------------------------------------------------------------------------|----|-----|-----|------|-----|
| I did learn substantial issues on emergency & crisis management in this class.        | 29 | 3.00| 5.00| 4.58 | 0.56|
| Network/relationship building emphasized in class is critical in real life.           | 29 | 4.00| 5.00| 4.75 | 0.43|
| Activities in the class were helpful in developing networks/relationships.            | 29 | 2.00| 5.00| 4.03 | 0.82|
| Team activities were helpful in to my learning in the course.                         | 29 | 1.00| 5.00| 3.37 | 1.08|
| Service-learning term projects were helpful to my learning.                           | 29 | 1.00| 5.00| 3.65 | 1.11|
| Field visits (e.g., EOC visit) were helpful to my learning.                           | 29 | 1.00| 5.00| 4.55 | 0.94|
| Practitioner guest speakers were helpful to my learning.                               | 29 | 3.00| 5.00| 4.76 | 0.51|
| FEMA IS Courses were helpful in understanding class materials.                         | 29 | 3.00| 5.00| 4.41 | 0.73|
| Position papers were helpful in understanding the course material.                    | 29 | 3.00| 5.00| 4.10 | 0.67|
| Diverse experiences of my classmates were helpful to my learning.                     | 29 | 3.00| 5.00| 4.10 | 0.81|
| I found the mixed-mode design of the course useful (online and face to face).         | 29 | 1.00| 5.00| 4.03 | 1.23|
| Valid N (listwise)                                                                    | 29 |     |     |      |     |

The average response for the effectiveness of the classroom activities indicates a general agreement in the classroom toward their positive effects. Team activities and service-learning projects were perceived as less effective than other tools of learning. The average decisions for these two tools were between “neither agree/nor disagree” and “agree.” Field visits and guest speakers were perceived as the most effective elements of learning within the course with mean scores of 4.55 and 4.76 respectively. Students generally agreed that FEMA-IS courses, position papers, and experiences of classmates were useful for their learning. Mixed-mode class settings were also found useful, although relatively high standard deviation indicates that some students were not in favor of it.

Responses to open-ended questions in the same survey support the overall results of the descriptive statistics presented in Table 4. In response to the question referencing the most useful tools employed in class, students mostly emphasize position papers, field visits, and guest speakers. The following two comments can be considered a summary of the overall responses:
(a) The position papers were most useful because they sparked discussion and explanation in class that helped increase my understanding of the issues.

(b) I think that the guest lecturers were most useful for learning because they allowed me to see how the academic component of emergency management ties into professional applications for emergency management. The guest lecturers also seemed to collectively stress the importance of strong management skills in any field, inclusive of emergency management.

Students felt that the position paper was a good networking tool to build relationships within their group during the semester. Although many students enjoyed the position papers, not many had positive feelings concerning the term projects. While some felt that working with real agencies and solving their issues was a great way to network and gain insights into practical issues, some students felt the term project should have been an individual assignment rather than a team assignment. Additionally, some students felt the FEMA IS courses were very helpful as well.

In response to the second question that asked students for recommendations to improve the course, students suggested inviting more guest speakers, conducting the class face-to-face as opposed to mixed mode, assigning individual projects instead of group projects, and replacing term projects with shorter assignments (such as one-page reaction and response papers). As mentioned earlier, some students seem to have been uncomfortable working in groups for their term projects, which is challenging due to time and the decision-making disadvantages of teamwork, though some argued that group projects developed their teamwork skills. Moreover, a student recommended that more student networking and bonding activities should be developed, such as writing position papers in different groups as opposed to writing position papers and term papers as part of the same group. Thus the feelings concerning group assignments and projects are mixed and require a more in-depth study.

The preference for a face-to-face design was explained by the need to employ more opportunities to have quality and sophisticated discussions in class when compared to the mixed mode, which uses online activities. A few students also suggested that in addition to the FEMA IS courses, a disaster training element such as a tabletop exercise should be included in the class as well. Another student recommended that instead of the term project, the group project should focus on practicing drafting an emergency operations plan. Both these recommendations focus on including more activities that will help bridge the gap between knowledge and practical training/practice and developing a better community of practice.
CONCLUSION

This study focused on the university classroom environment as the community of practice, and presented insight on how course design and activities can enhance learning. The literature stresses the importance of leadership and/or facilitation to increase community collaboration; thus, by example, learning in a social context was supported by the findings of this study through the analysis of two surveys conducted in class with students during the academic semester.

The results of the survey show that through student participation in engaging and reflective class activities and assignments, learning did take place. The friendship network was greatly strengthened in class over the course of the semester, for the analysis shows there were no weakly connected individuals at the end of the semester. The advice network, on the other hand, remained dotted with cliques that were weakly connected to each other through only one or two nodes. The main reason for this is attributed to the emphasis placed on team service-learning projects that formed a major part of the class grade and required groups to work very closely with each other. Position papers also required the same teams to work together but for a shorter period of one to two weeks. Thus preestablished work and team relationships, and the silo effect of working in teams, are exhibited through the lack of connectedness within the advice network. Additional survey results on the perceived effectiveness of various instructional and assessment tools in class show that position papers, guest speakers, and field visits were the most enjoyable segments of the class for students and contributed the most to their learning. Term projects seemed to be the least enjoyable activity for students, since they had to face many challenges concerning group dynamics and managing tasks.

The findings point to the fact that the class environment can be and should be designed in a way that promotes learning through social interaction. In a sense, social interaction in class should be facilitated and directed toward the deliberate actions of collaboration, which in turn result in learning. It is also important to have a course design that reflects both the theoretical and practical insights of the field taught. Having a balanced design of theory versus practice as well as lecturing versus discussion-based teaching is an essential part of presenting the classroom environment as communities of practice.

The research conducted for this paper and strategies provided in it can be replicated in other settings in public affairs and administration programs or courses. Most of the programs in the field of public affairs and administration are applications oriented and focus on community-based problem-solving activities or service-learning projects. Some issues should be highlighted in regard to communities of practice in a classroom environment. First, facilitative leadership plays a vital role in determining the direction of community participants’ actions. This is especially important because community actors might have clique-
oriented or subgroup agendas that should be transformed into overall common community strategies. Producing different actions for a common goal is possible only with an overarching authority that monitors and facilitates the subordinate ideas, thoughts, and actions.

Second, it is essential to grasp the idea of collaboration that would intertwine different mind-sets and lead toward a single common goal. Collaboration is specifically important in terms of the interdisciplinary nature of the issues that communities of practice generally face. Thus, working collaboratively means working across boundaries of disciplines, fields, groups, and mind-sets. Collaboration also represents the utilization of different methods and tools when trying to reach a common goal. Diversity of perspectives, ideas, instruments, and solutions is a richness communities of practice inherently bring about.

Third, communities of practice are environments of dynamic learning. Learning in such environments takes place as a result of the collaborative action facilitated by a higher authority. In turn, learning leads to further collaboration on the basis of accumulated experience and knowledge. Collaboration and learning thus stand as mutually reinforcing phenomena mediated and moderated by leadership. Accordingly, the methods and tools designed to teach or promote learning should be structured in a way that fosters collaboration, and vice versa.

Fourth, communities of practice should be built upon the reflections of the practical world. The interaction with real-world practitioners and firsthand experience are the strengtheners and justifiers of in-class activities. They are vital in promoting interest, increasing awareness, and fostering reality-based judgments in the comparatively close environment of classrooms. They are also direct sources of information and knowledge, which is exceedingly important for projects and activities performed in the class.

Finally, the network survey results show that the teaching tools used in classrooms provided an increase in student interaction even though the work network did not change substantially. The second survey, in which students commented on the usefulness of class activities, shows that activities establishing interaction with peers and the professional world (e.g., EOC visits, guest speakers) have made a significant contribution to student learning. That coincides well with the literature, since the classroom is a community of practice itself, and a stage where students establish the fundamentals of their professional career. Classroom activities give students the opportunity to become embedded in a learning environment consisting of peers and professionals. Tailoring similar practices to different classroom settings would enable students of different courses and disciplines to learn from their peers and connect classroom knowledge with real-world examples.

There are some additional points for professors who would like to apply these practices in the classroom environment. First, every discipline has different specifications, and there is no one-size-fits-all approach to creating a
community of practice. Expectations from students are different for each class; thus, tailoring class activities toward the community of practice method is critical. Second, professors are the facilitators of the classroom community, and building a community of practice is in their hands. In that sense, the facilitators of communities of practice need to be able sense the students’ tendencies and use appropriate strategies to promote collaborative activities within the classroom and within the professional environment. For example, putting students merely into groups, without a variety of strategies encouraging peer interaction (e.g., class discussions, position papers, online teaching tools) may create isolated cliques within the class. Thus, students become stuck in small group networks and lose the opportunity to learn from experiences of their peers and the classroom environment. Last, linking the class environment with the professional world is vital for combining the theoretical knowledge originating in class with real-life experience.

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APPENDIX A

Network Survey for XXX Course

The purpose of the survey is to collect data on collaborative learning in the classroom environment for XXX course students. The analysis will identify the informal (friendship) network and work-related (formal) network in the classroom as a living organization in the beginning of the term and toward the end of the term. It also will identify the most helpful activities for student interactions. Your responses are confidential, and will not be revealed without your consent; only aggregate results will be made available. Your participation in the research is voluntary and will not affect your grade for the class. If you have any questions, please contact Dr. XXX at xxx@xxxx or at (XXX) XXX-XXX.

Your name: ____________________________

Please name the students that you know in the class (you can list as many as you wish):
1. _____________________
2. _____________________
3. _____________________
4. _____________________
5. _____________________

Please name the students that you work/consult with for study/assignments and related issues in the class (you can list as many as you wish):
6. _____________________
7. _____________________
8. _____________________
9. _____________________
10. _____________________

Which aspect of the course activities helped you interact and learn from the class members (you can check more than one option)?

__ Team service learning (term) project
__ Class discussions
__ Position papers
__ Peer paper evaluation
__ FEMA EMI IS courses
__ Other (please specify): __________
### Appendix B

**Survey for Learning in the Context of Lived Experience**

The purpose of this short survey is to collect information on learning through lived experiences as part of the XXX course. The analysis will identify the perceived effectiveness of theoretical and practical learning materials, tools, and activities in actual learning. It also will identify the most helpful activities that provide learning opportunities to students. Your responses are confidential and will not be revealed without your consent; only aggregate results will be made available. Your participation in the research is voluntary and will not affect your grade for the class. If you have any questions, please contact Dr. XXX at xxx@xxxx or at (XXX) XXX-XXXX.

Please rate each of the following statements based on your experience during the term.

| Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree |
|----------------|-------|----------------------------|----------|-------------------|
| 5              | 4     | 3                          | 2        | 1                 |

[ ] I did learn substantial issues on emergency and crisis management in this class.
[ ] Network/relationship building emphasized in the class is critical in real life.
[ ] Activities in the class were helpful in developing networks/relationships.
[ ] Team activities were helpful to my learning in the course.
[ ] Service learning term projects were helpful to my learning.
[ ] Field visits (e.g., EOC visit) were helpful to my learning.
[ ] Practitioner guest speakers were helpful to my learning.
[ ] FEMA IS courses were very helpful in my learning in the class.
[ ] Position papers were helpful in understanding the course materials.
[ ] Diverse experiences of my classmates were helpful to my learning.
[ ] I found mixed-mode design of the course useful (online and face-to-face).

Please provide additional feedback to the following questions:

Which learning tools (e.g., term projects, position papers) used in the class were most useful for learning? (Additional recommendations) _____________________________

What are your recommendations for further improvement in the design of the managing emergencies and crisis course? _____________________________

Please check one of the options most appropriate for you.

As part of which program are you taking this course?

[ ] MPA  [ ] EM certificate  [ ] MNM  [ ] PhD  [ ] Other (please specify): _______