

GROUPWORK IN AN ONLINE LEARNING ENVIRONMENT:
STUDENT PERCEPTIONS OF USEFUL AND CHALLENGING FACTORS

by

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(Under the Direction of Dr. Janette R. Hill)

ABSTRACT

Online groupwork is becoming an increasingly popular instructional strategy. Although researchers have questioned the benefits of groupwork in online learning environments, little research has examined the challenges it presents. The purpose of this study was to investigate the experiences of students involved in online groupwork to examine the factors that students recognize as challenging or in the learning process over time. This study used a qualitative embedded case study design with the group as the case. Data were collected using a background survey, individual interviews, one group interview, observations, and archival document collection. The participants were six students in two groups who were graduate students at a large southern university. Data were collected over a sixteen-week period.

The findings indicated that the two groups found that previous experience, work habits, small group size, shared interest, shared profession, convenience and flexibility of the technology, sense of connection, and feedback from group members were helpful for their online groupwork. While the students in these two groups worked relatively well as a group, they did face some challenges over the course of the semester. They attempted to overcome these

challenges with varying degrees of success. Technology, task, communication, accountability, and feedback from the instructor were challenges for groupwork. However, each group perceived different factors as being helpful or challenging in the learning process in online groupwork. The individual group members had different levels of satisfaction with their online groupwork.

Students' perception of online groupwork is a result of interaction among group members and the instructor. This study suggested critical factors that affect group interactions and offered helpful strategies to promote group interaction for learning. This research also provided strategies for students and instructors that can assist students in completing their online groupwork successfully. Finally, this research provided implications for practice and suggested directions for future research.

The findings of this study confirm much of the previous research while also offering new insights into the processes of online groupwork by using qualitative research methods with the group as a case. By listening to the voices and examining the perspectives of all the members of small groups, this study contributes to the new, yet growing, literature base on online groupwork.

INDEX WORDS: Student perceptions, online learning, groupwork, cooperative learning, collaborative learning

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To

MY PARENTS

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CHAPTER I

INTRODUCTION

Background

Online learning has grown rapidly in recent years and continues to expand as educators in a variety of sectors adopt this form of education (Anderson, 2004; Duffy & Kirkley, 2004; Saba, 2005). For example, the number of students enrolled in distance education courses offered by in degree-granting postsecondary institutions increased from 1.6 million in the fall 2002 to 3.5 million during the fall 2006. The percent of postsecondary students who enrolled in at least one online course increased from 10% in 2002 to 20% in 2006. More than two-thirds of all higher education institutions now offer online courses, with the majority of these providing programs that are fully online (Allen & Sherman, 2007). The growth of online learning is expected to continue in the foreseeable future for both undergraduate and graduate education.

As with face-to-face learning environments, online learning environments are designed in a variety of ways and use many strategies to meet the needs of students. For example, students can be asked to complete work individually as well as in groups in online courses. In addition, the development of online technology has facilitated the delivery of learning opportunities from traditional instructional formats to a more learner- and/or group-centered format. Groupwork has become popular as an instructional strategy utilized in both online and face-to-face environments. Online groupwork is an instructional strategy that is becoming increasingly popular (Bonk, Lee, Liu, & Su, 2007). Online groupwork is defined as students working together as a small group, “executing simultaneous, collaborative work processes through electronic media without regard to geographic location” (Chinowsky & Rojas, 2003, p. 89). Groupwork facilitation in online

courses ranges from participation in a private discussion board to working in small groups in a virtual classroom or chat room as part of the learning process.

In online learning environments, students in groups can spend time on class projects on their own terms—in places and at times that best meet their own needs. Through bulletin boards, chat rooms, electronic mail, and white boards, students can communicate with their instructor and with each other from various locations. To complete a group project, they share information and resources, compare their opinions, and debate with their team members asynchronously or synchronously through computer-mediated communication, although they may be geographically separated. Among the advantages of an online learning environment is increasing access, pedagogical potential for enhancement, convenience and flexibility, as coursework can be arranged asynchronously or synchronously to meet the needs of group members.

Some of the literature related to online learning indicates that groupwork in online classes is beneficial because it enables learners to develop higher order and critical thinking skills, as well as to build knowledge and meaning (Conrad & Donaldson, 2004; Fung, 2004; McAlpine, 2000; Palloff & Pratt, 2005). For example, students can dynamically receive help and get feedback on ideas through the process of discussion, and they can negotiate meaning through debating with team members and experiencing the multiple perspectives of their group members. However, others have indicated that online groupwork may be perceived as being more challenging than groupwork in face-to-face settings (Graham, 2002; Häkkinen, 2004; Taylor, 2005). Some factors that may negatively impact the students' perceptions of online groupwork include difficulty with technology, increased workload, limited group interaction, and difficulty communicating.

The factors of online groupwork that students find challenging in the working and learning process may change over time. For example, at the beginning of a class, some students may be frustrated with the course if an acceptable comfort level with the technology and the online course format is not reached (Conrad & Donaldson, 2004). Also, when communication is constrained by the technical apparatus, the collaborative process may not be able to function at an optimal level (Ragoonaden & Bordeleau, 2000).

Other perceived challenges to online groupwork are related to difficulties with communication, including achieving a consensus, making decisions, and doing groupwork. Challenges with communication may result from group members working in different time zones and being unable to meet face-to-face (Kim, Liu, & Bonk, 2005; Ragoonaden & Bordeleau, 2000), not sharing a common native language (Carr-Chellman, Dyer, & Breman, 2000; Ragoonaden & Bordeleau, 2000), or having different writing styles (Koh & Hill, 2006). These challenges can lead to an increased frustration with the group process.

Another challenge indicated in the literature is that groupwork among distance learners may lack some of the social interaction that occurs in face-to-face settings. This may result in unfamiliarity among group members, which can lead to underdeveloped group dynamics (Carr-Chellman, Dyer, & Breman, 2000; Fung, 2004; Graham, Scarborough, & Goodwin, 1999). Online collaborative groups may go through delayed group developmental stages and take longer to develop social relationships (Fung, 2004; Gunawardena et al., 2001; Johnson, Suriya, Yoon, Berrett, & Fleur, 2002; Sudweeks & Allbritton, 1996).

Scholars have stressed the need to take a closer look at group interaction in online learning environments in order to promote effective interaction among group members. There is a need to create effective Web-based collaborative learning environments to enhance the quality

of students' groupwork experiences and to enhance the level of student satisfaction. While numerous research studies have documented the communication and technological challenges that learners face in collaborative learning, there is little empirical research that has been published that closely examines why online groupwork may be challenging. Furthermore, there is little empirical research that closely examines why online groupwork is so challenging for some students. We need to expand our understanding of what students find challenging as well as what they perceive as helpful about group work in online settings so that we can extend and improve our practice.

Purpose Statement and Research Questions

The purpose of this study was to explore the experiences of students participating in online groupwork. My intent was to investigate students' perspectives related to small group interactions, as well as their perceptions of the critical factors that impact their group interactions. I also sought to identify strategies that can be implemented to assist students in completing groupwork online. Specifically, the three main research questions were:

1. What factors of online groupwork do students recognize as being helpful in the learning process over time?
2. What factors of online groupwork do students recognize as being challenging in the learning process over time?
3. What do students suggest can be done in the learning environment to make their groupwork and collaboration more effective?

Significance of the Study

This study provides suggestions for online educators regarding how to better facilitate online groupwork. The perceived strengths of online learning environments in higher education

are the flexibility and convenience they provide to learners (Song, Singleton, Hill, & Koh, 2004). Despite these advantages, several researchers have challenged the benefits of groupwork in online learning environments (Graham, 2002; Häkkinen, 2004; Taylor, 2005). Many educators lack expertise in building and promoting effective teams in an online class, and improving the quality of online classes remains an important and necessary challenge. Many research studies have been conducted on online learning in general (Kim et al., 2005; McDonald & Gibson, 1998; Richardson & Swan, 2003; Rourke, Anderson, Garrison, & Archer, 1999; Swan & Shih, 2005; Tu & McIsaac, 2002), there have been few that were focused on the small groups that are often involved in collaborative activities in online classes (Smith, 2003; So, 2006). For example, one of the suggested factors for improving online groupwork is to promote social interaction within the group. Researchers have suggested this variable as a way to promote group dynamics, but they have also pointed out the need for further research in this area (Fung, 2004; So, 2006). To address this need, more investigations on the critical factors that impact group interactions are essential; equally important are studies that offer helpful strategies on how to promote group interaction for learning.

By focusing on an online class that emphasizes groupwork and by using qualitative methods, this study contributes to the new, yet growing, literature base on online groupwork. Some of the research in this area has employed quantitative research methods (Beaudoin, 2002; Driver, 2002; Fulford & Zhang, 1993; Gunawardena & Zittle, 1997; Krejins & Kirschner, 2004; LaPointe & Gunawardena, 2004; McDonald & Gibson, 1998; Picciano, 2002; Richardson & Swan, 2003; Rovai, 2002; Swan & Shih, 2005). Although some research has used qualitative methods (Cape, 2006; So, 2006), it has generally focused on small groups within natural settings (Kitchen & McDougall, 1999), not examining the voice and perspective of the whole group

using qualitative research methods using the group as a case. This research has investigated how students interact with group members and perceive groupwork in an online class. It has also examined the factors of online groupwork that students recognize as being challenging or helpful in the working and learning process over time. I suggest critical factors that affect group interactions and offer some strategies on how to promote group interaction for learning.

Limitations and Delimitations of the Study

This study has several limitations as well as delimitations. The limitations are as follows:

- The findings of this study may not apply to students in other courses, as their groupwork experience may be different.
- The research was conducted by a researcher for whom English is a second language, which may have impacted data collection and analysis.

The delimitations of the study include the following:

- I observed and interviewed the members of two groups in an online class.
- The instructor was an experienced online instructor (Minimum 2 years teaching online).
- The online systems used for the course were the established, standardized systems of WebCT® (<http://www.webct.com>) and HorizonWimba® (<http://www.wimba.com>).
- I focused on student group interaction through small group collaborative learning.

Despite these limitations and delimitations, this study has generated useful insights regarding how to promote small group collaborative learning.

Definitions of Terms

For the purpose of the study, the following definitions are used.

Asynchronous

Not occurring at the same time or happening at different times.

Asynchronous Communication

Interaction between two or more people that is time-delayed, that is, separated by minutes, hours, or even days. Asynchronous communication, for instance, is characterized by time independence, where the sender and receiver do not communicate at the same time.

Asynchronous forms of online communication are email, discussion lists, and bulletin boards (Schlosser & Simonson, 2002).

Collaboration

Collaboration is described as “a process of willing cooperation with peers and colleagues to reach educational objectives” (Romiszowski & Mason, 2004, p. 412).

Collaborative Learning

One instructional strategy used for the social construction of knowledge and skills, collaborative learning is a phrase that implies “working in a group of two or more to achieve a common goal, while respecting each individual’s contribution to the whole”(McInnerney & Roberts, 2004, p. 205). Bruffee (1999) states that collaborative learning requires “students to perform in ways that the teacher has not necessarily determined ahead of time” (p. 295) and further contends that “collaborative learning therefore implies that [the instructors] must rethink what they are doing when they are actually teaching” (p. 72).

Computer Mediated Communication (CMC)

CMC is any form of communication between two or more students who interact via a computer-supported tool to enhance learning. CMC tools can be classified into asynchronous CMC and synchronous CMC tools. Asynchronous CMC tools such as discussion boards and electronic mail enable students to contact each other at any time. Synchronous communication

tools enable students to interact at the same time, online speaking and listening to one another in real time.

Community

McMillan and Chavis (1986) offer this definition of community: “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p. 9). They define the most essential elements of community as mutual interdependence among members, connectedness, interaction, spirit, trust, common expectations, and shared values and beliefs.

In a school, the term “learning community” is used for student learning. Bielaczyc and Collins (1999) describe a learning community as a “culture of learning in which everyone is involved in a collective effort of understanding” (p. 271). Community also supports the growth of individual knowledge. Members in a community share their common goals, depend on each other, collaborate on tasks and activities, and have feelings of belonging and trust. Accordingly, community can be constitutively defined in terms of four components: spirit, trust, interaction, and learning (Rovali, 2001). Han (2005) defines communities as “groups that emerge when enough group people interact and form webs of personal relationship” (p. 83) in an online context. The community is “the vehicle through which learning occurs online” (Palloff & Pratt, 1999, p. 29). Based on these various definitions, community in this study refers to a group of people who maintain their common goals, depend on each other, collaborate on tasks and activities, and share feelings of belonging and trust. In a community, then, the perceived sense of community is defined as having feelings of belonging together, trusting one another, and working toward common benefits from shared experiences.

Cooperative Learning

The term “collaborative learning” is often confused or used interchangeably with “cooperative learning,” but it is important to understand the differences between the two terms. Johnson and Johnson (2004) state that cooperative learning is “the instructional use of small groups so that students work together to maximize their own and each other’s learning” (p. 786). They also assert that cooperative learning has more structure and less student direction than collaborative learning, which means simply that students work together on projects or tasks toward learning goals. Cooperative learning uses a task specialization approach where students take divided tasks, and then their results are combined into a final product; collaborative learning places an emphasis on mutual engagement to reach a common group goal (Bernard, Rubalacava, & St-Pierre, 2000; Kitchen & McDougall, 1999). Thus collaborative learning provides more opportunities to develop mutual engagement, knowledge and skill exchange, and interpersonal communication skills. Johnson, Johnson, and Holibec (1994) point out several conditions for group efforts to be more productive than individual efforts: positive interdependence, interaction, individual accountability, social skills, and periodic and regular group processing.

Groupwork

Groupwork is defined as “students working together in a group small enough so that everyone can participate on task that has been clearly assigned” (Cohen, 1994, p. 4). Moreover, students are expected to carry out their tasks without direct and immediate supervision from the teacher.

Group Dynamics

The term group dynamics implies that individual behaviors may differ depending on individuals’ current or prospective connections to a group (Forsyth, 1999). Mennecke, Hoffer and Wynne (1992) define group development as “the degree of maturity and cohesion that a

group achieves over time as members interact, learn about one another, and structure relationships and roles within the group” (p. 526). They describe three types of group development models: progressive, cyclical and non-sequential. A progressive model is based on the belief that groups exhibit an increasing degree of maturity and performance over time. One of the well-known progressive models is the Team development model developed by Tuckman (1965). Tuckman’s group development model assumes that most groups move through four stages: forming, storming, norming, and performing.

Interaction

In both the learning and working processes, interaction is important for student online collaborative groupwork. Students communicate with their peers, group members, and instructor, negotiate meaning, and provide feedback through interaction. Moore (1989) acknowledges that interaction is “another important term that carries so many meanings as to be almost useless unless specific sub-meaning can be defined and generally agreed upon” (p. 1). He identified three types of interaction: learner-content, learner-instructor, and learner-learner. Later, Hillman, Wills and Gunawardena (1994) added learner-interface interaction to reflect the growing role of technology in distance education. Sutton (2001) inserted vicarious interaction as a fifth type of interaction in CMC. Vicarious interaction occurs “when a student actively observes and processes both sides of a direct interaction between two other students or between another student and the instructor” (Sutton, 2001, p. 227).

Wagner (1994) defines interactions as “reciprocal events that require at least two objects and two actions” (p. 8), adding that interaction occurs when these objects and events mutually influence one another with the purpose of changing behaviors of learners and moving learners toward an educational goal. Similarly, Vrasidas and McIsaac (1999) define interaction as “a

process consisting of reciprocal actions of two or more actions within a given context” (p. 25) that is influenced by the course structure, class size, feedback, and prior experience with CMC. Their research emphasizes the importance of socially constructed meanings from the participants’ perspectives.

Additionally, some researchers have defined social interaction by stressing the cognitive or social dimension of learning. For example, Gunawardena, Lowe, and Anderson (1997) define interaction as the process through which negotiation of meaning and co-creation of knowledge occurs. Based on the review of various definitions, social interaction in this study refers to interpersonal interaction—students communicating with their peers, group members, or the instructor to negotiate meaning and get feedback. Peer interaction can be promoted through various collaborative activities. Through these activities, the opportunity for learning from peers and interacting with them in conversation is more likely to occur. These activities are directly related to learning outcomes which are focused on social interaction (Northrup, 2001).

Social Presence

Social presence, which was first introduced by Short, Williams, and Christie (1976), is “the degree of awareness of another person in an interaction and the consequent appreciation of an interpersonal relationship” (p. 66). Social presence has two variables: intimacy and immediacy. Intimacy can include elements such as “eye contact, physical proximity, and topic of conversation” (Tu, 2002, p. 133). Immediacy is “the psychological distance between a communicator and the recipient of the communication” (p. 134). Immediacy is conveyed through speech and related verbal and nonverbal cues (Walther, 1992).

In an online learning environment, social presence—the feeling of community (Rovai, 2002) or connection (Gunawardena & Zittle, 1997) among learners—is one aspect of interaction

that has received considerable attention in the literature. However, Gunawardena and Zittle (1997) differentiate interactivity and social presence, arguing that social presence requires users to add one more step to awareness of interactivity; in short, when users notice it, there is social presence. They stated that “interactivity is a quality of that may be realized by some or remain an unfulfilled option. When it is realized and when participants notice it, there is ‘social presence’” (p. 10).

Garrison and Anderson (2003) define social presence as “the ability of learners to project themselves socially and emotionally into a community of inquiry through the mediums of communication being used” (p. 49). Tu and McIsaac (2002) define it as “a measure of the feeling of community that a learner experiences in an online learning environment” (p. 131).

Swan (2005) defined social presence as the degree to which participants in CMC feel socially and emotionally connected. So (2006) had a similar definition: “the psychological degree to which a learner perceives the presence of and connectedness with other learners in a computer-mediated learning environment” (p. 7). Based on the review of various definitions, social presence in this study refers to the degree to which learners in computer-mediated learning environments feel the presence of and connectedness with other learners through interaction.

Synchronous

Occurring in real time; not time-delayed.

Synchronous communication

An interaction between individuals or groups that occurs at the same time, that is, with no delay between the sender and the receiver. Synchronous forms of communication are face-to-face, telephone, chat rooms, and video conferencing (Romiszowski & Manson, 2004; Schlosser & Simonson, 2002).

Summary

In this chapter, I presented the background of the problem, stated the purpose of the study, discussed the significance of the study, described the limitations and delimitation of the study, and defined terms. In the next chapter, I will examine the literature regarding the theoretical foundations of several key areas for the study, including social interaction and social presence.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to explore the experiences of students participating in online groupwork. My intent was to investigate students' perspectives on small group interaction, as well as their perceptions of the critical factors impacting group interactions. In this chapter, I review the literature that is relevant to the study's purpose. Specifically, I will address the following questions:

1. What factors influence a student's experience in an online learning environment?
2. What is the relationship between groupwork and learning in an online learning environment?
3. How does group dynamics affect online groupwork?
4. How does social interaction affect online groupwork?
5. How does social presence affect online groupwork?
6. How can technology be used to facilitate online groupwork?

This literature review is divided into five major sections addressing the following areas of research: (a) online learning environment, (b) collaborative learning in an online learning environment, (c) social interaction in an online learning environment, (d) social presence in an online learning environment, and (e) technology. The final section provides a conceptual framework that synthesizes and integrates the findings.

To locate the literature for this study, I relied upon the EBSCOhost, ProQuest, Education Full Text, and Dissertation Abstracts (ProQuest Dissertations and Theses) databases, along with the ERIC Index. I also reviewed four journals focused on the topic of distance or online education: *Distance Education*, *American Journal of Distance Education*, *Journal of Distance*

Education, and *Journal of Asynchronous Learning Network*. In addition, I used the University of Georgia GIL catalog to search for books cited by the authors of peer-reviewed journal articles.

Finally, I used Social Sciences Citation Index to trace the use of citations located in other works. During this process, I utilized the following search terms with “online learning” as a filter: constructivism, social constructivism, constructivist (learning) theory, social presence, collaborative learning, groupwork, satisfaction, community, group dynamics, perception, and interaction or social interaction.

Online Learning Environment

Online learning is a popular delivery method for teaching and learning in higher education settings. The number of degree-granting higher education institutions offering distance education courses increased from 33 percent in 1995 to 56 percent in 2000-2001. More specifically, 12 percent of all institutions indicated that they planned to start offering distance education courses in the next three years (National Center for Educational Statistics, 2003).

As in face-to-face learning environments, online learning environments are designed in a variety of ways, using many strategies to meet the needs of the students. Online collaborative learning has become more accepted as an instructional strategy utilized in both online and face-to-face environments as Web-based communication systems have improved and grown (Bonk, et al., 2007). To gain more insight into students’ perceptions of online learning, I explore student perceptions and challenges that students may encounter.

Student Perceptions of Online Learning

In an online learning environment, learners perceive flexibility and convenience as strengths (see, for example, Song, Singleton, Hill, & Koh, 2004). They can spend time on class projects on their own terms—namely, without having to be physically present. Through bulletin

boards, chat rooms, electronic mail, and whiteboards, students can communicate with their instructor and with each other at any time. In fact, the main advantages of online learning are convenience and flexibility, as it can be arranged asynchronously or be adapted for self-paced study (Homborg, 2004). Other scholars have reported that students participating in online learning can develop critical thinking skills as well as reflection skills. The asynchronous environment allows students to read messages, reflect on them, and write carefully about their ideas (Cerejjo, Young, & Wilhelm, 1999; Petrides, 2002; Vonderwell, 2003). Students receive thoughtful and responsible comments from their classmates. Conrad and Donaldson (2004) argue that collaborative activities in online learning environments that involve student idea sharing and other forms of interaction trigger deeper processing of content. Palloff and Pratt (2005) also point out that groupwork in online learning environments promotes transformative learning by developing critical thinking skills and encouraging reflection.

While there are many advantages to online learning, there are also numerous challenges, both for instructors and students. For example, the degree of satisfaction or dissatisfaction that learners' experience in online learning varies (Chyung & Vachon, 2005; Fjermestad, Hiltz, & Zhang, 2005). Because student satisfaction is an important element related to the quality of online education (Bourne & Moore, 2003), one needs to consider student satisfaction as a factor for enhancing the quality of the learning experience. We also need to know what factors students' recognize as being challenging in the online learning experience.

Challenges Students Face With Online Learning

The literature related to online learning indicates that students experience frustration in several areas: technological problems (Hara & Kling, 1999; Song et al., 2004), delayed feedback from the instructor (Hara & Kling, 1999; Song et al., 2004; Vonderwell, 2003), ambiguous

instructions on the Web site and via e-mail (Hara & Kling, 1999), lack of sense of community (Kim et al., 2005; So, 2006; Song et al., 2004), and difficulty understanding the objectives of the online courses (Song et al., 2004). For example, Song et al. focused on graduate students' perceptions of the helpful and challenging aspects of an online learning environment. In their study, course design, learner motivation, time management, and comfortableness with online technologies impacted the success of online learning experiences. Technical problems, a perceived lack of sense of community, time constraints, and difficulty understanding the objectives of the online courses created challenges for the students. For a successful online learning experience, Song et al. recommended effective instructional design, time management skills, and a feeling of connection as critical factors in online contexts.

Similarly, Kim, Liu, and Bonk's study (2005) also focused on students' perspectives on the benefits and challenges in an online MBA program. In their study, the authors found that online learning was more challenging than learning in traditional face-to-face classes. The delayed feedback from the instructor and difficulty communicating with peers due to their time zone differences and the absence of face-to-face meetings were challenges in students' online learning. Kim et al. notes that virtual teaming was a key factor influencing the students' online learning experience. They suggest that more research is needed regarding how to promote effective facilitation and online work groups and how to develop students' virtual teaming skills. As with the Song et al. (2004) study, they suggest that lack of sense of community among online students is an issue that needs to be explored in future research studies.

In summary, the overall benefits and challenges of online learning create an important context for understanding specific interactions in these environments. As indicated above, many of the reported benefits and challenges relate to participant interaction. This pattern also holds

true when examining groupwork in online contexts. Several aspects of groupwork reported as being beneficial and challenging are related to the social interaction that occurs when teams of students work collaboratively toward project completion. The next section of this review addresses the theoretical foundation of groupwork and the benefits and challenges of groupwork in online learning environments.

Groupwork in Online Learning Environments

As the development of online technology has continued to improve and grow, new technology has facilitated the delivery of learning opportunities from traditional instructional formats to a more learner- and/or group-centered formats. Online groupwork has become more accepted as an instructional strategy utilized in both online and face-to-face environments. Both cooperative learning and collaborative learning involve the instructional use of small groups so that students work together on projects or tasks. There are differences between cooperative learning and collaborative learning. Some groupwork may lead students to collaborative learning that places an emphasis on mutual engagement to reach a common group goal (Bernard et. al., 2000; Kitchen & McDougall, 1999). Other groupwork may lead students to cooperative learning which uses a task specialization approach where students divide the tasks independently and then combine their results into a final product. In this chapter, I focus on reviewing the literature regarding collaborative groupwork (that is collaborative learning). Collaborative learning is often situated within a constructivist or social constructivist theoretical framework. In this section, I discuss constructivism, social constructivism, and the benefits and challenges of collaborative learning situated within these theoretical perspectives.

Constructivism

Constructivism as an epistemology. Constructivists see knowledge as being constructed through the mental processes of learners “engaging with objects in the world and making sense of them” (Crotty, 1998, p. 58). While constructivist theory is difficult to define precisely because a variety of learning theories claim to be associated with it (Driscoll, 2000; Duffy & Cunningham, 1996; Gredler, 1997), it does have some central tenets that are somewhat universal.

Constructivists believe that learning takes place when people try to interpret their experiences including phenomena in the world around them. That is, their understanding of reality is based upon their perceptions of their experiences (Driscoll, 2000). Therefore, the knowledge a person accumulates can be said to be a function of his or her prior experiences and his or her perceptions of those experiences (Jonassen, 1994). Constructivists share the view that “learning is an active process of constructing knowledge rather than just acquiring it” (Duffy & Cunningham, 1996, p. 171). It naturally follows that a constructivist approach to instruction entails supporting processes that involve the construction of knowledge rather than knowledge transmission (e.g., lecture, drilling, and rote memory exercises) (Duffy & Cunningham, 1996; Jonassen, Davidson, Collins, Campbell, & Haag, 1995).

Constructivism as a philosophy of education. Constructivist learning theories have been proposed by many, but the scholar most closely associated with constructivism theory is Piaget, who proposed that intellectual growth results from the processes of assimilation and accommodation (Piaget, 1969). From a Piagetian perspective, intellectual development depends on physical environment, maturation, social influence, and equilibration (Driscoll, 2000). According to Piaget, learners think and acquire knowledge from manipulating real objects, experiencing conflict between their own perceptions and real world events, and then

reorganizing their thinking. Piaget assumed there to be an interaction between heredity and environment and also labeled his view “interactionism” (Driscoll, 2000, p. 187). Piaget believed peer interaction to be one key source of cognitive development. Teacher and peers may therefore serve as sources of cognitive disequilibria, or stimuli for individual learning (Driscoll, 2000; Duffy & Cunningham, 1996; Gredler, 1997).

Learning through peer interaction, however, does not ensure that learners in a group share the same levels of understanding. An individual student’s learning is what often enhances the quality of education (Lisi & Golbeck, 1999). In collaborative activities, learners compare their opinions with group members, sometimes debate their opinions (supporting or opposing different viewpoints), and experience the multiple perspectives of each group member. Cognitive conflict can arise when there is perceived contradiction between what they expect and what is actually encountered. Cognitive development, as defined by Piaget, is the process through which learners reconcile the cognitive conflict provoked by differing points of view (Forman & Carzen, 1985; Gilly, 1990). It is the process that allows learners to build understanding and reshape their worlds through collaborative learning.

Social Constructivism

Social constructivism supports the view that people actively construct knowledge through sharing meanings with others in their culture. It emphasizes the socially and culturally situated context of which the subject is a part and highlights the importance of social interactions in developing knowledge (Duffy & Cunningham, 1996). One of the most renowned social constructivists is the Russian Lev Vygotsky. Vygotsky’s theory emphasizes the influence of cultural and social contexts on learning and the critical importance of interaction with people—other children, parents, and teachers—in cognitive development. He argued that a person’s

cognitive development must be explained as the product of social interactions; it is the process by which learners are integrated into a knowledge community (Scardamalia & Bereiter, 1996; Vygotsky, 1978).

A key component of Vygotsky's theory is the Zone of Proximal Development (ZPD), which is formally defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Full development of the ZPD depends upon social interaction. In a ZPD, the range of skills that can be developed with adult guidance or peer collaboration exceeds what can be attained alone (Driscoll, 2000; Gredler, 1997).

While social interaction is important for learning, the ZPD illustrates how social interaction can lead to cognitive development. Students participate in collaborative activities such as problem solving or group projects. Students' learning is not indicated by the task that they can complete unaided; rather, it depends on the tasks they can complete in collaboration with group members. Social interaction facilitates a ZPD. This, in turn, enables learners to construct their knowledge independently. The ZPD also enables scaffolding, in which learners are given a great deal of support initially and are then encouraged to become more independent and to take more responsibility for their learning by way of group members, peers, or their instructor. Knowledge is constructed through the social interaction with others (Driscoll, 2000; Duffy & Cunningham, 1996).

Jonassen et al. (1995) state that the basic principle of a constructivist learning environment is that it "engage[s] learners in knowledge construction through collaborative activities that embed learning in a meaningful context and through reflection on what has been

learned through conversation with others” (p. 13). The constructivist learning environment should support these essential attributes: “context, construction, collaboration, and conversation” (p. 13). Web-based collaborative learning is grounded in both constructivist and social constructivist approaches to learning, as it provides students with opportunities for constructing knowledge both individually and socially. Both Vygotskian and Piagetian development theories are helpful in understanding students’ cognitive development through a Web-based collaborative learning environment.

Collaborative learning. Collaborative learning is one of the instructional strategies used for the social construction of knowledge and skills. Collaborative learning is a learner-centered and team-focused approach rooted in constructivist and social learning theories (Alavi & Dufner, 2004). Collaborative learning is based on “a model that treats that the students as active participants as individual or group activities” (Benbunan-Fich, Hiltz, & Harasim, 2005, p. 22).

The advantages of collaborative learning are abundant, ranging from academic to social and psychological factors (Roberts, 2005). Through participant interaction and collaboration, students experience multiple perspectives and construct their knowledge. More importantly, students can develop critical thinking skills through the process of judging, valuing, supporting, or opposing different viewpoints (Fung, 2004; McAlpine, 2000). Collaborative learning encourages students to engage more deeply and actively and to reflect more on what and how they are learning. Moreover, collaborative learning can also help students to develop interpersonal and social skills and can increase students’ self-esteem and motivation (Cohen, 1994; Slavin, 1995). While there are many positive aspects, there are also challenges associated with collaborative learning. Curriculum design and assessment, as well as the quality of student

learning and student perceptions towards groupwork, are well known as challenges in collaborative learning environments (Tu, 2004).

Research on collaborative learning has focused on understanding the conditions under which positive effects are most likely to occur. Online collaboration does not occur automatically, nor does it simply make learning easier. Online collaboration is affected by several factors. For example, Zhang and Ge (2006) proposed the dynamics of online collaborative learning model, which consists of team task, team development, peer relationship, and communication media (Zhang & Ge, 2006). Team task is concerned with task types and complexity with regard to their cognitive demands for collaboration requirements for media. Team development discusses possible challenges that may be encountered during different stages of team development. Peer relationships, which are affected by both emotional conflicts and cognitive conflicts, impact both team development and peer performance. Communication media also impact task type and team development (Zhang & Ge, 2006). Similarly, So (2006) found important positive factors that impact student perceptions of collaborative learning, including peer support, task authenticity, accountability, and computer mediated communication (CMC) technology.

Han and Hill (2007) explored how the asynchronous discussion supported by a Web-based learning system facilitated collaborative learning using qualitative research methods. Upon interviewing students and instructors, along with examining the discussion forum, they found that three main categories with multiple themes emerged from the data as being important for facilitating collaboration in online environments: context (i.e., structural support, active participation), community (i.e., formation of membership, generation of social discourse), and cognition (i.e., social process of learning, communal facilitation). Han and Hill recommend the

use of small discussion groups to reduce challenges in managing the large number of messages generated and to support students' engagement in more in-depth discussions. They also suggested the use of multiple modes of communication, which assists active participation, group-focused activity, and dynamic interaction among learners.

Fostering the culture of community appears to be a key contributor to be the perception of successful learning. Han and Hill also suggested encouraging participants to share their backgrounds and experiences both formally and informally. The authors suggested that the generation of social dialogue may encourage participants to engage in discussion, enabling the development of social presence.

In order to produce effective virtual learning groups, collaborative group-based learning must successfully incorporate three important processes: creation of the groups, structuring of learning activities, and facilitation of group integrations. The important factors for creating effective learning groups in an online learning environment include group size and group composition. Learning activities should be structured to create positive independence and accountability. Group integration also requires developing group skills and group norms (Graham, 2002; Graham & Misanchuk, 2004). These factors have been found to help learners engage in powerful, meaningful collaborative processes that allow them to learn content and develop better collaborative learning. These factors are also important for group dynamics and group development in virtual learning environments.

Group development process. Mennecke, Hoffer, and Wynne (1992) define group development as “the degree of maturity and cohesion that a group achieves over time as members interact, learn about one another, and structure relationships and roles within the group” (p. 526). One well-known group development model created by Tuckman (1965)

assumes that most groups move through four stages—forming, storming, norming, and performing—over time:

- *Forming*: Members get to know each other and try to determine their positions in the group, procedures to follow, and the rules of the group.
- *Storming*: Storming begins when conflict arises as team members resist the influence of the group and oppose accomplishment of the task.
- *Norming*: Norming begins when the group establishes social relationships and commitment to its tasks, finds new ways to work together to accomplish the tasks, and sets norms for appropriate behavior.
- *Performing*: Performing occurs when the group focuses on completing the task, shows the ability to work together to achieve its goals, and becomes more flexible in following procedures for working together.

Like a linear model, each stage of Tuckman's model is an essential step for a team; if the first step is not accomplished, the later stages will not be successful. Tuckman's group development theory implies three things: (1) groups need time to develop group cohesion and functioning group norms before they can focus on performing the task; (2) time needs to be spent developing social relationships and socializing new members, establishing goals and norms, and defining the project; and (3) groups may go through periods of lower task performance as they try to resolve conflicts about relationships and task issues. To move through the phases of group development more efficiently, students are required to interact with each other and to engage in the activities experienced within the group.

Students are usually more satisfied with their group when the group is cohesive rather than non-cohesive (Forsyth, 1999; Hackman, 1992). As group cohesion increases, group

dynamics grow stronger. Finally, students in cohesive groups more readily “accept their group’s goal, decision, and norms” (p. 161). They interact more with their members, perform better, and learn more than do students in non-cohesive groups. The group process provides opportunities for shared definition of meaning, giving each member opportunities to take advantage of the struggles of the other members to understand, thus facilitating the group members’ adaptive process (Koschmann, 1996). Group process affects both students’ learning and satisfaction. Despite the success of group projects, the group process may be detrimental to particular areas of student learning. For example, Druskat and Kayes (2000) found that team building intervention (the promotion and outlining of clear procedures, responsibilities, and deadlines) may reduce team learning due to the short-term project’s time constraints.

Some researchers have explored group dynamics and development in online learning environments. For example, McDonald and Gibson (1998) explored group dynamics and development in a computer conferencing course, focusing on the interpersonal aspects of the interactions among and between learners, instructors, and the group as a whole. They found that interpersonal issues remained prominent. Johnson, Suriya, Yoon, Berrett, and Fleur (2002) examined the community building process of 36 graduate students enrolled in a Global Human Resource Development master’s program. These students worked in virtual learning teams as they formed a group, established roles and group norms, and addressed conflict. The students in the course were geographically dispersed throughout ten different states in the United States, as well as two other countries; the course was taught entirely online. The groups, each with five to six students, were based on geographical location to reduce the impact of different time zones on group interaction.

The results of the Johnson et al. indicated that virtual learning groups can collaborate effectively to accomplish group tasks at a distance. Problems occurring in the virtual teams stemmed from a lack of willingness to participate, lack of planning, conflicting schedules, and individual disagreements. Most of these are social interaction issues that may hinder building team trust and unity. Johnson et al. recommended several strategies for improving virtual team development and group processing: (1) select appropriate virtual learning team tasks that should establish clear objectives and benefits for implementing group-assigned tasks, especially in a virtual environment; (2) provide team-building and collaboration training activities; and (3) develop project timelines that match the team development model. Project timelines that are established by the instructor should be reasonable and allow enough time for students to adjust themselves to work in a virtual environment.

Some cultural and individual factors impact the online group process and group development. For example, Gunawardena et al. (2001) investigated whether there were differences in perception of online group process and development between participants in Mexico and the United States. They found that there were significant differences in perception of group development between participants in the two countries. They identified (1) language (2) gender differences (3) collectivist vs. individualist tendencies (4) social presence (5) time frame in which the groups functioned, and (6) technical skill as key factors that influence online group process and development. They recommend cultural issues in the online learning environment as a future research area as they believe, as does Wegerif (1998), that the social aspect influences the effectiveness of online learning. Educators need to consider students' educational and social context including language and culture (Guy, 1999).

Increasingly, researchers have begun viewing groups as social systems. According to Forsyth (1999), groups are systems of interacting individuals within a dynamic environment; their group development is affected by many different elements. Carabajal, Lapointe, and Gunawardena (2003) suggest three online group development dimensions: task, social, and technological. Further study needs to occur to better understand how the dimensions interact, but initial results indicate that all of the dimensions are important. Carabajal et al. (2003) also suggest that groups go through the three stages of entry, process, and outcome. Entry consists of any factors present at the beginning of the group setting, such as members' characteristics, learners' skills and personalities, gender, group size, task types, and culture. Process elements include participation, role, communication pattern, group history, and leadership. Outcomes are what the group produces and achieves, including the groups' performance (e.g., product, decisions) and the groups' satisfaction. Because a group is a dynamic system, online group development is affected by many different elements within an online learning community. In developing an online group, all entry elements influence group processes, which also affect group members' satisfaction and group performance.

In discussing group dynamics, Forsyth (1999) also included intrinsic motivation in the individual-level factors and extrinsic motivations in the environment-level factors that impact group dynamics. Intrinsic motivation refers to motivation to engage in an activity for its own sake. Intrinsic motivation includes learner's interest. Extrinsic motivation refers to motivation to engage in an activity in order to obtain some separable outcome, such as a grade, reward, or teacher praise (Pintrich & Schunk, 2002). Course requirements often serve as extrinsic motivation for participation and performance by establishing an external incentive or goal to which the learner strives (Laszlo & Kupritz, 2002).

For online group development, Palloff and Pratt (2005) suggest that online groups build trust first, and then move through several phases, including a normative phase, a problem-solving phase, a disagreement or conflict phase, an action phase, and a termination phase. They note that “a strong sense of community can assist groups in moving through the phases of their development more effectively” (p. 18). Similarly, Conrad and Donaldson (2004) also recommend the implementation of strategies for learning in online engagement phases, where phase one focuses on the individual, phase two focuses on cooperative learning, phase three focuses on collaborative learning, and phase four (the last phase) focuses on the overall community. Providing enough time (i.e., two to three weeks) to move through each of the phases is critical to effectively developing a fully engaged frame of mind in the learner (Conrad & Donaldson, 2004). In this frame, at the beginning of a class, an online learner must establish comfort with the technology, comfort with primarily text-based communication, and comfort with the online course. The learner will be frustrated with the course if the comfort level is not reached. In addition to these elements, learners have the uncertainty of having to quickly build trust and interdependence with others whom they may never meet. So the online instructor must provide increasing opportunities for learners to know and trust one another, with the goal that learners will gradually be able to develop into a community.

In summary, Web-based collaborative learning is grounded in both constructivist and social constructivist approaches to learning as it provides students with opportunities for constructing knowledge both individually and socially. Both Vygotskian and Piagetian development theories are helpful in understanding students’ cognitive development through a Web-based collaborative learning environment. Through collaborative learning, students experience multiple perspectives and construct knowledge. They can develop critical thinking

skills through the process of judging, valuing, supporting, or opposing different viewpoints. Collaborative learning encourages students to engage more deeply and actively and to reflect more on what and how they are learning.

It should be noted that online collaboration does not occur automatically, nor does it simply make learning easier. Online collaboration is affected by several factors. These factors are also important to group dynamics in an online learning environment. Group dynamics play an important role in enhancing students' learning and satisfaction. The factors that influence group dynamics include the following:

- individual characteristics (e.g., gender, technical skills, language, culture, learning style, motivation);
- group characteristics (e.g., group size, task type) (Carabajal et al., 2003; Johnson et al., 2002);
- process (e.g., participation, communication pattern, roles, leadership, group history (Carabajal et al., 2003; Palloff & Pratt, 2005), peer relationship, social presence, peer support (So, 2006; Zhang, 2006), accountability (Graham, 2002; Graham & Misanchuk, 2004; So, 2006));
- technology (e.g., communication media, CMC technology (Carabajal et al., 2003; So, 2006; Zhang & Ge, 2006));
- instructor's pedagogy; and
- course design (e.g., timeframe, motivation) (Carabajal et al., 2003; Gunawardena et al., 2001; Johnson et al., 2002).

Social Interaction in an Online Learning Environment

Many educators and learning theorists consider learning to be largely a social process. Interaction is important for student online collaborative groupwork. Students communicate with their peers, group members, or instructors; they also negotiate meaning and receive feedback from others. These are examples of interaction. These interactions can impact students' perceptions of collaboration and social presence. This section begins by reviewing types of interaction, and then continues with a discussion of social interaction, the importance of social interaction, and previous research on interaction.

Types of Interaction

Interaction has been described using various terms and different types of classification. Moore (1989) acknowledges that interaction is “another important term that carries so many meanings as to be almost meaningless unless specific sub-meanings can be defined and generally agreed upon” (p. 1). He identifies three types of interaction: learner-instructor, learner-learner, and learner-content.

Learner-instructor interaction is regarded as “essential by many educators and highly desirable by many learners” (Moore, 1989, p. 2). The interaction occurs between instructor and learners. The instructors need to keep the students motivated to learn, give appropriate feedback for support, and continue a dialogue at a distance (Moore, 1989). Learner-learner interaction takes place “between one learner and other learners, alone or in group settings, with or without the real-time presence of an instructor” (Moore, 1989, p. 4). The interaction between students is intended to stimulate and motivate learning. It also makes teaching more effective. Learner-content interaction is the interaction that results from students examining and studying the course content. Learner-content interaction focuses on the “process of intellectually interacting with

content that results in changes in the learner's understanding, the learner's perspective or cognitive structures of the learner's mind" (p. 2). Students' learning thus occurs through interacting with the course content as presented in the online course.

Hillman, Wills, and Gunawardena (1994) added learner-interface interaction as the fourth interaction. It occurs between the learner and the technology in online education in order to accomplish a task. It also shows the increasing role of technology in online education. This may be one of the most challenging types of interaction since it is not required in the traditional classroom. Hillman et al. point out that the medium affects learner-interface interaction particularly when learners are unfamiliar with how to use software and hardware to complete their learning tasks.

As a fifth interaction in CMC, Sutton (2001) included vicarious interaction, which occurs "when a student actively observes and processes both sides of a direct interaction between two other students or between another student and the instructor" (p. 227). Learning takes place when a learner observes the actions (not interactions) of another and the results of those actions. She argues that direct interaction is not necessary for all students and that those who observe and actively process interactions between others will benefit through the process of vicarious interaction.

A term often confused with interaction is "interactivity." Interactivity describes the "technological capability for establishing connections from point to point (or from point to multiple points) in real time" (Wagner, 1997, p. 20). Interactivity seems more feature-oriented and emphasizes the characteristics of the delivery system or the degree of interaction that certain communication channels provide. By contrast, interaction seems more process-oriented and focuses on dynamic actions (Wagner, 1997).

Gilbert and Moore (1998) categorized interactivity into two sub-categories: social interactivity and instructional interactivity in online learning environments. Gilbert and Moore use this classification to help select which technical tools are the best fit for an instructional setting given the educator's needs. One level of interactivity introduced by Wather (1996) is hyperpersonal communication. Hyperpersonal communication represents the highest level of affection or emotion of interaction in an online learning environment, surpassing face-to-face interaction.

Most, if not all, types of interaction and interactivity play a role in the learning process. Some types, however, play a stronger role in certain circumstances than others. Groupwork activities focus on the learner-learner interaction—that is, group interaction in a team. In this study, I focused on learner-learner interaction.

Social Interaction

Interaction is defined in terms of a learning process, objective, or outcome. Learning rarely takes place solely through unidirectional instruction. The social process of interaction is required for optimal learning (Lave & Wenger, 1991). Wagner (1994) defines interactions as “reciprocal events that require at least two objects and two actions” (p. 8). Interaction occurs when these objects and events mutually influence one another with the purpose of changing behaviors of learners and moving learners toward an educational goal. Similarly, Vrasidas and McIsaac (1999) define interaction as “a process consisting of reciprocal actions of two or more actions within a given context” (p. 25). In an online course, meaning is constructed through social interaction as learners interact through online conversation.

Role of social interaction in an online class. Some researchers have defined social interaction by stressing the cognitive or social dimension of learning. Social interaction

strengthens knowledge acquisition and enhances student learning. For example, Gunawardena, Lowe, and Anderson (1997) define interaction as the process through which negotiation of meaning and co-creation of knowledge occurs. LaPointe and Gunawardena (2004) investigated the relationship between peer interaction and learning outcomes. Their results indicate that self-reported learning outcomes are strongly related to self-reported peer interaction. Perceived teaching style and prior CMC experience also influenced peer interaction and learning outcomes. Trentin (2000) recognized social interaction among all participants as the key contributing factor in enhancing the educational quality of an online course.

Social interaction enhances learner satisfaction in web-based course. Some research supports the relationship between interaction, learning outcomes, and satisfaction in web-based courses. For example, interpersonal interaction (Fulford & Zhang, 1993) and small group interaction (Driver, 2002) have been found to affect learner satisfaction. Jung, Choi, Lim, and Leem (2002) found that social interaction is more related to learning outcomes than to learner satisfaction. Thus, social interactions are important for enhancing learning and increasing participation in online discussions.

Social interaction also impacts group formation, group dynamics, and the building of group structures in that it “affects both cognitive and socioemotional processes that take place during learning, group forming, establishment of group structures, and group dynamics” (Kreijns et al., 2004, p. 155). Social interaction is necessary for students not only to get to know each other, but also to build friendships, trust, and a sense of community. Strong social relationships may contribute to group cohesion, the degree of common understanding amongst group members, an orientation toward cooperation, and the desire to remain in their group (Krejin, Kirschener, & Jochen, 2003). However, lack of social interaction may hinder the

successful operation of virtual teams. In his study on online courses in two universities, Rovali (2001) concluded that an asynchronous network-based online course that includes monthly face-to-face meetings builds a better sense of community than a similar program with only annual face-to-face meetings. In the more successful course, students had more diverse opportunities to interact with each other, allowing them to build team spirit, trust, and community. Kollock (1998) states that the key challenges the Internet community will face are not simply technological, but involve social interaction. This is not to understate the difficulties of creating and implementing new technologies, but rather to underline that even these tasks can fail because of the problems of facilitating and encouraging successful online interaction and online communities.

Factors that impact social interaction in an online learning environment. Social interactions are affected by factors such as technology, individual learners' characteristics, courses, and instructor's characteristics. Understanding how these elements work together in an online context is important for facilitating learning. For example, based on Reeves' (1994) model, Apedoe (2005) provides eight factors that should be included within the context of an inquiry-based pedagogical framework: course objectives, course content, pedagogy, task characteristics, instructors' roles, students' roles, technological affordances, and assessment strategies. She suggests that failure to align these dimensions will undermine the successful design and implementation of an inquiry-based pedagogy in an online course. Reeves and Reeves (1997) proposed a model of Web-based instruction that points out the effective pedagogical dimension that Web-based instruction can convey. Their ten dimensions are pedagogical philosophy, learning theory, goal orientation, task orientation, source of motivation, teacher role, metacognitive support, collaborative learning, cultural sensitivity, and structural

flexibility. Reeves and Reeves developed a model to support the design of learning experience; their model takes advantage of the unique characteristics of the pedagogical opportunities afforded by a web-based instructional environment.

Another dynamic model for online interaction was suggested by Benbunan-Fich, Hiltz, and Harasim (2005). They envisioned online interactive learning as a dynamic model that organizes research variables in terms of an input-process-outcomes model. Input factors are those that are expected to influence how technology affects the individual and the collaborative learning processes. These processes will determine the outcomes. In this model, the inputs include four factors: the individual student (learning styles, cultural values, ability, and motivation), instructor (skill, pedagogical model), technology (time difference, geographical dispersal, software interface), and course (size and organizational setting). These four contextual factors shape the communication and learning processes within the online learning environment: the amount and type of interaction, the learning activities conducted there (individual and/ or collaborations of the environment), and the participants' perceptions of the environment (e.g., perceived social presence, perceived sense of community). The output factors include quality of learning, satisfaction as affected by technology, pedagogy used by instructors, expectations and skills of students, and the nature of the higher educational organizations themselves (Benbunan-Fich et al., 2005).

Gender also affects social interaction. Jeong and Davidson-Shivers (2006) examined response patterns in exchanges between males and females and their effects on gender participation in five online debates. Students classified messages as arguments, evidence, critiques, and elaborations while posting messages in the debates to facilitate argumentation and the sequential analysis of message-response sequences. The findings indicated no difference in

number of critiques posted in response to arguments between females and males. However, during an online discussion, females posted fewer rebuttals to the critiques of females than did males, and males posted more rebuttals to the critiques of females than did females. This study explained and predicted gender differences in participation and served as a framework for future research on gender participation, group interaction, and strategies for facilitating collaborative argumentation and problem solving (Jeong & Davison-Shivers, 2006).

Nature of task also affects social interaction. Woo (2006) investigated how the students in a Web-based learning environment interact to accomplish authentic tasks and what meaningful experiences they have in their learning. Her study sought to identify the nature and process of interaction occurring in a Web based learning environment using authentic tasks. In addition, the perspectives of students were reviewed in the relationship between interaction experiences and learning. The case was a master's level course offered online by a university in Australia, with five in-depth interviews with an instructor and four students conducted in Australia. The study showed that using the inclusion of authentic tasks in a Web-based learning environment led to meaningful interaction that directly influenced students' learning (Woo, 2006). The use of authentic tasks promoted student motivation and cognition. From a motivation perspective, authentic tasks engaged student interest and intrinsic motivation, which leads to better learning. Tasks and learning activities were important influences on student motivation and cognition (Pintrich & Schunk, 2002).

Perceived teaching style (LaPointe & Gunawardena, 2004; Vrasidas & McIsaac, 1999), previous CMC experiences (LaPointe & Gunawardena, 2004; Vrasidas & McIsaac, 1999), course structure, and class size (Vrasidas & McIsaac, 1999) affect students' social interactions. For example, in Varasidas and McIsaac's (1999) study, social interactions were influenced by

the structure of the course, class size, feedback, and prior experience with CMC. Their research emphasizes the importance of socially constructed meanings from the participants' perspectives. The structure of the course influenced interaction. Some elements of structure, such as required activities, led to more interactions, while other aspects of structure led to fewer interactions. Students indicated that their desire to achieve good grades was an important factor that led to frequent participation. In particular, when there is an imbalance between individual tasks and group tasks in course evaluation, it may impact the students' academic progress and learning outcomes.

Beatty (2002) proposed a situational framework for selecting instructional methods that engage learners in social interaction. In his study of a situational framework, Beatty found that individual skills, ability, technical background, motivation, time commitment, students' values, technology, and task types affect social interaction in an online learning environment. For example, asynchronous group collaboration methods are influenced by students, technology, and content features. Students are required to have technical skills and ability to use collaborative technology in an online course. Technology must have technical features that sufficiently facilitate group collaboration. Additionally, content should be appropriate to collaborative learning activities. In other words, collaborative learning activities should make sense to the student. For group discussion in an online class, students should value the discussion activity, be motivated to participate in the discussion, have enough time to participate, and know enough about the topics of discussion in order to engage in meaningful conversation with others. For effective synchronous group discussion, students' technical skills, students' backgrounds, and class size are important factors for engaging learning. Students must have adequate technical skills in using the discussion technology in order to participate effectively (Beatty, 2002).

Through investigating social interaction in an asynchronous learning group, Kreijns et al. (2004) proposed a framework in which relationship sociability, social presence, pedagogical technique, and social interaction are all important aspects for facilitating groupwork in an online context. In this model, sociability of the online learning environments refers to how computer-supported collaborative learning environments can differ in their ability to facilitate the emergence of a social space. They point out that social space, which is characterized by effective work relationships, strong group cohesion, trust, respect, belonging, and a strong sense of community, is important since it facilitates and reinforces social interaction, as well as influences the effectiveness of collaborative learning. The higher the sociability, the more likely that social interaction may occur or increase, and the more likely that social interaction may result in an emerging social space. Technology and instructor's pedagogical strategies impact both social presence and social interaction. Social presence, technology, and instructor's pedagogical strategies may enhance social interaction.

In summary, social interaction plays an important role in enhancing students' learning, satisfaction, group formation, group dynamics, and the building of group structures. Factors that influence social interaction include the following:

- individual characteristics (e.g., gender, technical skill, ability, motivation, background [including prior CMC experience and online learning], motivation, students' values) (Beatty, 2002; Benbunan-Fich et al., 2005; Jeong & Davidson-Shivers, 2006; Reeves & Reeves, 1997; Vrasidas & McIsaac, 1999);
- technology (e.g., software interface, time difference, geographical dispersal, technical affordance, technical features) (Apedoe, 2005; Beatty, 2002; Benbunan-Fich et al., 2005; Kreijns et al., 2004; Reeves & Reeves, 1997;);

- task (e.g., task type, task characteristics, nature of task) (Apedoe, 2005; Beatty, 2002; Reeves & Reeves, 1997; Woo, 2006);
- context factors (e.g., course structure, assessment, class size, learning goal, time frame) (Apedoe, 2005; Becker-Beck et al., 2005; Reeves & Reeves, 1997; Vrasidas & McIsaac, 1999); and
- instructor (e.g., pedagogy, technical skill, CMC experience, teaching style, feedback) (Apedoe, 2005; Benbunan-Fich et al., 2005; Kreijns et al., 2004; LaPointe & Gunawardena, 2004; Vrasidas & McIsaac, 1999; Reeves & Reeves, 1997).

As described above, social interaction can be enhanced by social presence, technology affordance, and instructor's pedagogical strategies. In the next section, I discuss social presence in online groupwork.

Social Presence

Virtual teams need a means of achieving cohesion and maintaining relationships (Clarke, 1997). Social presence, or the feeling of community (Rovai, 2002) and connection among learners (Gunawardena & Zittle, 1997), is one aspect of interaction that has received considerable attention in recent literature. Social presence, which was first introduced by Short, Williams, and Christie (1976), is “the degree of awareness of another person in an interaction and the consequent appreciation of an interpersonal relationship” (p. 66). Garrison and Anderson (2003) regard social presence as “the ability of learners to project themselves socially and emotionally into a community of inquiry through the mediums of communication being used” (p. 49). Social presence has two variables: intimacy and immediacy. Intimacy can include elements such as “eye contact, physical proximity, and topic of conversation” (Tu, 2002, p. 133). Immediacy is “the psychological distance between a communicator and the recipient of the

communication” (p. 134). Immediacy is conveyed through speech and related verbal and nonverbal cues (Walther, 1992).

Roles of Social Presence for Successful Groupwork in an Online Class

Social presence plays an important role in student satisfaction with online courses (Gunawardena & Zittle, 1997; Picciano, 2002; Richardson & Swan, 2003; So, 2006; Swan & Shih, 2005). Gunawardena and Zitte (1997) define social presence as “the degree to which a person is perceived as ‘real’ in mediated communication” (p. 8) and examined how effective social presence was as a predictor of overall learner satisfaction at the GlobalEd computer conference. They found that social presence may be a strong predictor of satisfaction. Swan and Shih (2005) also explored the relationship between perceived social presence and satisfaction with online discussions in two courses. Comparing two courses, the researchers also explored the relationship between the development of social presence and variables related to instructor and course design. They found that that the perceived presence of instructors may be an influential factor in determining student satisfaction and that course design may also significantly affect the development of social presence. They provided evidence that students perceiving the highest social presence also projected themselves more into online discussions. Their research also revealed meaningful differences in perceptions of the usefulness and purpose of online discussion between students perceiving high and low social presence, suggesting that social presence can be promoted through instructor behaviors and careful course design (Swan & Shih, 2005).

Social presence affects students’ perceptions of their learning and interaction (Picciano, 2002; Richardson & Swan, 2003). Picciano (2002) examined student learning performance in an online course in relationship to student interaction and social presence in a graduate course. She

found a consistently strong relationship among learner perceptions of interaction, social presence, and learning. However, depending on the method of assessment; students' perceptions of social presence did not have a statistically significant effect on performance on the examination, although it did have a statistically significant effect on performance on the written assignment. Similarly, Richardson and Swan (2003) explored the role of social presence in online learning environments and its relationship to students' perceptions of learning with the course instructor. They found that students with high overall perceptions of social presence also scored high in terms of perceived learning and perceived satisfaction with the instructor. Students' perceptions of social presence overall contributed significantly to their perceived learning overall.

Social presence also helps to promote group dynamics and groupwork in an online class. It facilitates understanding the behavior of groups in that "insight into group dynamics can be useful in anticipating social conflicts or reduced motivation" (Garrison & Anderson, 2003, p. 80). Social presence also helps to build a strong sense of community, which can help "groups move through the phases of online group development more efficiently" (Palloff & Pratt, 2005, p. 18). Social presence enables students to promote effective groupwork and develop effective groups online, which assists the students in building a sense of community in an online class.

Some researchers have attempted to evaluate the level of social presence in asynchronous discussion. Rourke et al. (1999) and Hara, Bonk, and Angeli (2000) did find social interaction in online classes, but the level of social presence in student online discussions was limited, and student participation was unequal and of varying quality. Stacey (2002) argues that "social presence, the ability of online learners to project themselves into a textual environment which has few visual or contextual cues, . . . [is] an important element in facilitating effective online

learning” (p. 287). Social presence is an important element in student satisfaction and learning in an online learning environment. It is also important to understand what factors may impact students’ social presence.

Caples (2006) explored the role of social presence in an online professional development course for teachers and found evidence of social presence. The participants included 94 teachers enrolled in 3 online courses, divided into two groups: 68 participants in the large group and 26 participants in the small group. All participants in the large group were teachers and data were collected from their online textual threads for 30 days. For the small group, data were collected for the study using background and demographic surveys, a social presence survey, and an online discussion board. Caples’ focus was on comparing the results of the large (discussion thread) group to the small (social presence) group. The social presence group’s responses on the survey were compared to their actual responses written in the discussion threads. The results of the study indicated that there were levels of social presence in the written communication of the online community. The results also suggested that community moderators can affect the levels of social presence by assisting in the creation and enforcement of policies that govern the community.

Factors That Impact Social Presence in an Online Learning Environment

To seek more insight into social presence, some researchers have explored various aspects of it. For example, in their study of social presence in the online learning environment, Tu and McIsaac (2002) proposed three dimensions of social presence—social context, online communication, and interactivity—as elements important for establishing a sense of community among online learners. Social context was constructed from the CMC characteristics and students’ perceptions of the CMC environment. Social presence is impacted by the student’s

relationships: familiarity with participants, informal relationships, better trust relationships, and personally informative relationships. Online communication is related to the attributes of the language used online and the applications of online language. Interactivity includes the cooperative activities in which CMC users engage and the communication styles they use.

Investigating student experiences and student perceptions of collaborative learning, So (2006) examined social presence and satisfaction in a graduate-level distance course. The results indicate a positive relationship between collaborative learning and satisfaction and also between social presence and overall satisfaction with the course. The results also indicated that emotional bonding and the communication medium were the most critical factors for social presence. To enhance social presence, So recommends designing instructional strategies that (1) employ a variety of “get to know each other” strategies, (2) provide synchronous communication channel, and (3) model instructor’s social presence. She also suggests that instructors balance multiple course components and consider a blended learning approach to enhance student satisfaction.

Closely related to social presence is a sense of community. Building a learning community is necessary for a sense of social presence and for successful learner-to-learner interaction (Kazmer, 2000). Hill, Raven, and Han (2002) explored the best practices for community-building strategies in two web-based courses at two universities. They found that participants in both courses expressed some sense of community, although limited in scope. Learners indicated a stronger connection with their team members than with the larger class group. Based on the findings, Hill et al. proposed two sets of strategies (infrastructure and interaction) to enhance communication during a class, creating opportunities for connections by and between learners and instructors. Infrastructure strategies provide a basic framework for community building through access to multiple communication technologies and personal

WebPages for each learner. Hill et al. also recommend giving learners sufficient opportunities to interact with each other as well as with the instructor. They address the importance of having face-to-face meetings. They believe that these connections, in turn, can lead to the emergence of a community that can support a learning outcome.

In summary, establishing social presence is an important aspect for effective online interaction and learning. Students can feel social presence through their online communication, and it influences their satisfaction with online courses and has a positive impact on their learning. Perception of social presence is an important key to understanding interpersonal interaction (Tu, 2002). When the level of social presence is high, social interaction among group members may increase in Web-based collaborative learning environments. Thus, social presence is important for promoting group dynamics and facilitating groupwork in Web-based collaborative learning environments. Social presence is affected by several factors, such as medium (So, 2006; Tu, 2002) and emotional bonding (Hill et al., 2002; So, 2006), peer relationships, social context (e.g., familiarity with participants), informal relationships, trust relationships, and personally informative relationships (Tu & McIsaac, 2002). Social presence can be promoted through instructor behaviors and careful course design (Swan & Shih, 2005). It can also be affected by technology, which is the focus of the next section.

Technology

Technology plays an important role in student's group collaboration. Various technologies are currently available for online collaborative groupwork. The CMC tools can be classified into asynchronous CMC and synchronous CMC tools. Asynchronous CMC tools, such as discussion board and electronic mail, enable students to contact each other at any time, even though they may be physically distant. The use of synchronous CMC tools like chat "increase[s]

interaction between course participants, supporting collaborative learning, and fostering social interactions between individuals” (Dede, Whitehouse, & L’Bahy, 2002, p. 13). Online learning environments can be mixed and matched with asynchronous CMC and synchronous CMC tool based on the course goals, learners’ preferences, learners’ lifestyle, and Internet access constraints.

Roles of Technology for Successful Groupwork in an Online Class

Technologies provide geographically and temporally distributed students with the opportunity for team collaboration in a virtual workplace in which tools and structures can be used to control and coordinate group processes. This space can be open to the team members but separate from the class common space (Tu, 2004). Students may be physically distant, but they are able to contact each other at any time. Although they do not meet face-to-face, team members communicate with each other, exchange their ideas via the bulletin board or email, and have group meetings through chat.

Technologies also can provide a socially supportive environment for knowledge construction through collaborative learning (Stacey, 1999). The discussion board for a group can enable group members to post and share information and opinions. In online chatting, the team can meet as a virtual group to discuss their projects or simply to brainstorm. Online chats can also provide a record of the interaction and contents occurring among group members (Rains & Scott, 2006). Through participant interaction and collaboration, students experience multiple perspectives and construct their own knowledge.

Technologies also facilitate personal connections with instructors and students, as well as enhance the degree of social presence among them (Durate & Snyder, 1999). The virtual space for the group or class provides the team members with a place both to work and to gather to

create personal profiles, carry on social conversations, build relationships, and improve the group's work (Tu, 2004). Like a team cybercafé, non-task specific discussion boards having different names can increase the level of intimacy and foster community.

The effective use of technologies plays an important role in communication and collaboration over time and distance. Technology can affect student interaction and satisfaction. Curtis and Lawson (2001) examined the nature of the interactions among students working in small collaborative groups in terms of collaborative learning behaviors, as well as the constraints and affordances of the communication tool. They found that the medium does influence the interaction among students. In addition, different communication forms such as face-to-face, synchronous, and asynchronous text-based computer-mediated communication differ in terms of their interaction level (Becker-Beck et al., 2005). Hence, groups often choose different methods to complete different types of tasks, showing that each form of interaction may have a different function for online learning (Rourke & Anderson, 2002).

The medium presents some major challenges for collaborative learning. Text-based CMC tools restrict the interpersonal communication to the exchange of text-based verbal expression (Krejins & Kirschner, 2004; Rohfeld & Hiemstra, 1995). Non-verbal language in online learning environments plays an important role in social interaction and team building (Johnson et al., 2002). Dirkx and Smith (2004) also found that the limitations in CMC and interaction exacerbate difficulties with interpersonal issues and getting group members to do their share. Online relationships and communications are further complicated by the technologies that students use to interact. Current web-based learning environments may not fully support opportunities for social interaction (Bonk et al., 2007; Krejins & Kirschner, 2004).

In an online learning environment, motivation can be identified as a dimension that influences learning success and when low, contributes to a high dropout rate (Paas, Tuovinen, Merriënboer, Darabi, 2005). Motivation also impacts student satisfaction in an online learning environment. Bures, Amundsen, and Abrami (2002) investigated the relationship between student motivation and student acceptance of learning via computer conferencing. During this study, 167 students in ten courses participated in questionnaires at the beginning and end of each course. Bures et al. found that intrinsic motivation (personal relevance of the tasks, students' beliefs concerning the relationship of computer conferencing to learning) and extrinsic motivation (task attractiveness) were the most important predictors of student satisfaction. They recommended that instructors focus on designing tasks that their students will like and will find personally relevant.

Some researchers have suggested that learner motivation may be lower online than in a face-to-face interaction. For example, Schemeeckle (2003) evaluated the effectiveness and efficiencies of online training as it compared to current classroom training. The classroom training group reported higher motivation and positive feelings concerning their instruction than did the online training group. Others, such as Hannafin, Hill, Song, and West (2007), have suggested that the complexity of online learning environments can influence student motivation. "Due to the increased technical and interpersonal complexity of many systems, motivation to engage may decline in many instances" (p. 128). The authors suggest that well-designed and supportive instruction will increase motivation to engage and learn in an online class.

Challenges

Many of the issues and challenges associated with technology are related to the "hardware, software, and network used for experiencing WBI [web-based instruction], to

complete assignments, and enable interaction” (Hill, 2002, p. 73). Technical difficulties can create a high level of frustration among learners (Gabriel, 2004; Song et al., 2004).

Communication tools can be difficult to use and may hinder communication between group members, which, in turn, can make collaboration between group members difficult. When communication is problematic, the collaborative process is not able to function at an optimal level (Ragoonaden & Bordeleau, 2000). Student experience of technology shapes and influences their perceptions of online collaborative learning, as well (Carr-Chellman, Dyer, & Breman, 2000; Ragoonaden & Bordeleau, 2000).

For a successful online collaborative learning environment, the instructor has to make students comfortable with the system and with the software that they are using. When this is done, the learner may devote more attention to the collaborative activity (Berge, 1995; Collins & Berge, 1996). Otherwise, they may experience frustration with the process of learning online if they have to learn how to use the program (Curtis & Lawson, 2001), deal with technology crashing, and learn course content at the same time (Gabriel, 2004). In Ragoonaden and Bordeleau’s study (2000), technical difficulties greatly hampered communication and, consequently, the sharing of attached files. These technical difficulties created a high level of frustration among the learners. The various mechanisms of collaboration, such as explanations, sharing answers, negotiating answers, peer encouragement, and peer sympathy, were not present (Ragoonaden & Bordeleau, 2000). Since communication was problematic, the collaborative process was not able to operate at an optimal level.

In summary, the medium affects interactions and group dynamics. It may provide an environment for knowledge construction through collaborative learning, or it may hamper the interpersonal interaction in which students work together. Technical problems may hinder

communication between group members, which, in turn, can make collaboration between group members difficult.

An Integrated View and Conceptual Framework

I began this chapter by indicating that I would explore the literature related to these six questions:

1. What factors influence a student's experience in an online learning environment?
2. What is the relationship between groupwork and learning in an online learning environment?
3. How does group dynamics affect online groupwork?
4. How does social interaction affect online groupwork?
5. How does social presence affect online groupwork?
6. How can technology be used to facilitate online groupwork?

In summary, group dynamics, social interaction, and social presence play important roles in enhancing students' learning and satisfaction. Table 2.1 summarizes several factors that can influence social presence, social interaction, and group dynamics.

Table 2.1. Factors which impact social presence, social interaction, and group dynamics.

	Social Presence	Social Interaction	Group Dynamics
Individual	.	<ul style="list-style-type: none"> • Technical skill • Ability • Background including prior CMC experience and online learning • Motivation • Student's value (Beatty, 2002; Benbunan-Fich et al. 2005; Vrasidas & McIsaac, 1999) 	<ul style="list-style-type: none"> • Technical skills • Language • Culture • Learning style • Prior groupwork experience (Carabajal et al.; Johnson et al., 2002)
Group		<ul style="list-style-type: none"> • Communication tool (Beatty, 2002) • Task (e.g., task type, task characteristics) (Apedoe, 2005; Beatty, 2002) 	<ul style="list-style-type: none"> • Group size • Task type (authentic) (Johnson et al., 2002; Zhang & Ge, 2006) • Communication tool (Carabajal et al., 2003; Johnson et al., 2002)
Context	<ul style="list-style-type: none"> • Course design (So, 2006; Swan & Shih, 2005), 	<ul style="list-style-type: none"> • Course structure, assessment • Class size • Learning goal • Time frame (Apedoe, 2005; Becker-Beck et al., 2005; Reeves & Reeves, 1997; Vrasidas & McIsaac, 1999). 	<ul style="list-style-type: none"> • Timeframe (Carabajal et al., 2003; Gunawardena et al., 2001; Johnson et al., 2002). • Assessment

Table 2.1. Factors which impact social presence, social interaction, and group dynamics (cont).

	Social Presence	Social Interaction	Group Dynamics
Process	<ul style="list-style-type: none"> • Emotional bonding (So, 2006) • Connection, sense of community (Hill et al., & Han, 2002) • Social context (the familiarity with participants, informal relationships, better trust relationships, and personally informative relationships)(Tu & McIsaac, 2002) 		<ul style="list-style-type: none"> • Communication pattern, conflict and how to manage it related to leadership and decision making) (Palloff & Pratt, 2005; Carabajal et al., 2003) • Accountability • Social presence • Peer relationship, social presence, peer support (So, 2006; Zhang, 2006) • Accountability (Graham, 2002; Graham & Misanchuk, 2004; So, 2006)
Technology	<ul style="list-style-type: none"> • Medium (So, 2006; Tu, 2002) 	<ul style="list-style-type: none"> • Software interface • Time difference • Geographical dispersal • Technical affordance • Technical features (Apedoe, 2005; Beatty, 2002; Benbunan-Fich et al., 2005; Kreijns et al., 2004), 	<ul style="list-style-type: none"> • Technology (e.g., communication media, CMC technology (Carabajal et al., 2003; So, 2006; Zhang & Ge, 2006))
Instructor	<ul style="list-style-type: none"> • Instructor strategies (Richardson & Swan, 2003; So, 2006; Swan & Shih, 2005). 	<ul style="list-style-type: none"> • Pedagogy • Technical skill • CMC experience • Teaching style • Feedback (Apedoe, 2005; Benbunan-Fich et al, 2005; Kreijns et al., 2004; LaPointe & Gunawardena, 2004; Vrasidas & McIsaac, 1999; Reeves, 1997). 	<ul style="list-style-type: none"> • Instructor’s pedagogy (Conrad & Donaldson, 2004; Palloff & Pratt, 2005)

Online groupwork requires a great deal of interaction among group members. This interaction impacts factors such as group formation, group dynamics, and the building of group structures. Social presence helps to build a strong sense of community, which can help “groups move through the phases of online group development more efficiently” (Palloff & Pratt, 2005, p. 18). Social interaction among group members may increase in Web-based collaborative learning when the level of social presence is high. Establishing social presence is an important aspect for promoting group dynamics and facilitating groupwork in Web-based collaborative learning (see Figure 2.1).

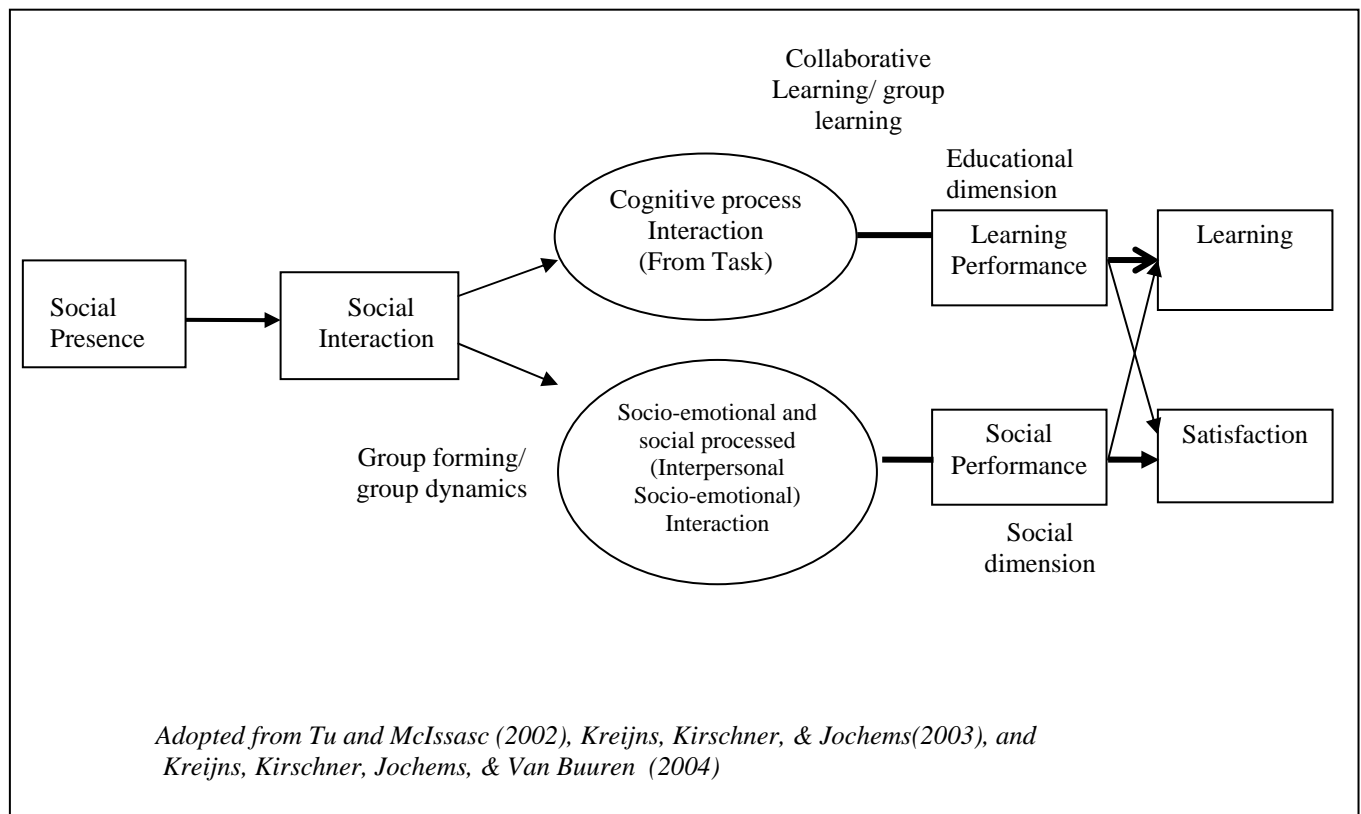


Figure 2.1. A relationship among social presence, social interaction, group dynamics, and satisfaction

For online groupwork, communication technologies provide geographically and temporally distributed students with the opportunity for team collaboration in a virtual workplace. Yet current web-based learning environments may not fully support opportunities for

social interaction. In this environment, online groupwork may be perceived as being more challenging than groupwork in face-to-face settings. These challenges include technological problems, delayed feedback from the instructor, lack of sense of community, difficulty in understanding the objectives of the online courses, high workload, time constraints, and poor group dynamics. These challenges should be addressed to improve the quality of learning and to increase students' satisfaction with online classes.

Conceptual Framework

Based on this literature review, I have created a conceptual framework to provide a model for understanding how these factors are operationalized (see Figure 2.2). These factors may affect students' perspectives of group interaction, as well as their perceptions of the critical factors that impact group interaction as I proposed this study.

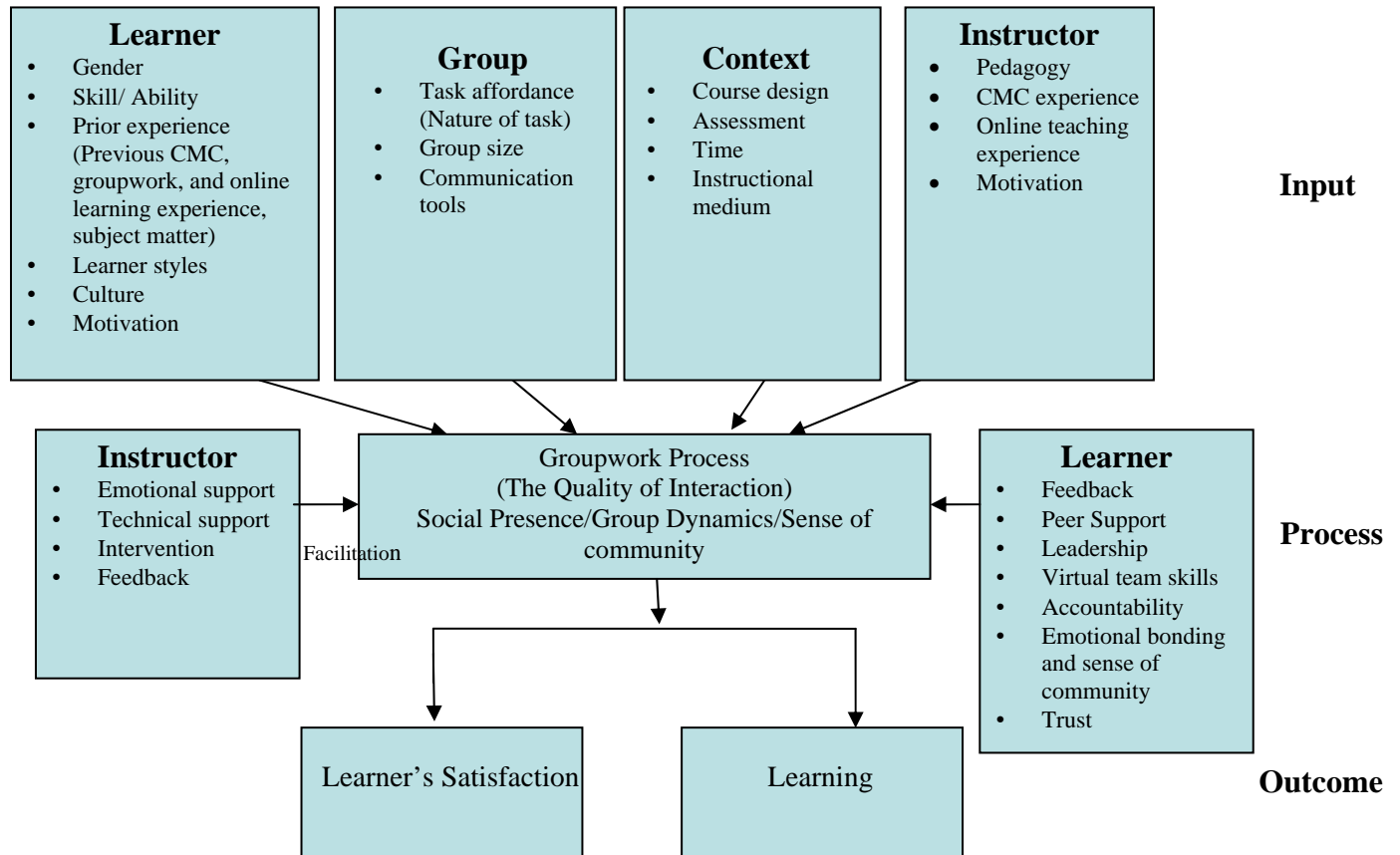


Figure 2.2. Conceptual framework

The framework is specific to online learning environments. As this conceptual framework begins with the different inputs to groupwork and consequently collaborative learning, that were identified, my description will begin there as well. Students' learning and satisfaction are affected by many different elements, such as individual characteristics, group characteristics, context, technology, and instructor's characteristics and teaching methods. In this input-process-output-dynamic model, input consists of any factors present at the beginning of the group setting. At the input level, there are four categories: individual, group, context, and instructor's characteristics. Technology impacts the four categories at the input level, as it relates to learners' technical skills, collaborative tools, instructional medium, and instructor's technical skill. These factors in the input level all influence the processes that take place as members work together to complete a task.

These input-level factors influence communication and learning processes within the online learning environment: the amount and type of interaction, the learning activities conducted there (e.g., individual and/or collaborative learning), and the participants' perceptions of the environments (e.g., perceived social presence, perceived sense of community). At the process level, the online instructor plays a role in offering guidance, feedback, and emotional support for students' groupwork in online learning environments. A learner also plays a specific role and exhibits certain skills in collaborating with group members to reach group goals.

Finally, the outcome is that a learner's learning and satisfaction is affected by technology, pedagogy used by instructors, expectations and skills of students, group dynamics, and the nature of the course context. Each of these factors is explored in more detail in the following sections.

As groups are systems of interacting individuals within a dynamic environment, online group development dimensions include task, social, and technological aspects. Understanding

how the dimensions interact is an area in need of further study, but initial results indicate that all of these factors are important.

Factors Impacting Online Group Dynamics, Social Interaction, and Social Presence

Input Level

Learner

Individual characteristics impact student social interaction, group development process, and satisfaction (Benbunan-Fich et al., 2005; Carabajal et al., 2003). The individual characteristics include gender, learner's previous CMC experience, groupwork experience, subject knowledge, language, learner culture, and motivation. Individual characteristics also influence the group process and will impact outcomes.

Gender. Gender differences affect group interaction, group participation, and group dynamics (Carabajal et al., 2003; Jeong et al., 2006). The effects on gender difference maintain themselves in online communication, with men focusing on task-orientated activities and women focusing on group maintenance activities (Carabajal et al., 2003). During an online discussion, females posted fewer rebuttals to the critiques of females than did males, and males posted more rebuttals to the critiques of females than did females (Jeong & Davidson-Shivers, 2006)

Learner technical skill or ability. Student's technical skills and ability to use the collaborative tools impact interaction and satisfaction (Benbunan-Fich et al., 2005; Carabajal, et al., 2003).

Prior experience. Previous CMC (Benbunan-Fich et al., 2005; Vrasidas & McIsaac, 1999) and groupwork (Drury, Kay, & Losberg, 2003) experience impact students' interaction and satisfaction. Students' Internet experience in class and their years of computer use also affect their satisfaction (Lim, 2001). Students who have previous CMC experience may feel more

comfortable with online communication (Vrasidas & McIsaac, 1999). Prior CMC experience also influences peer interaction and student learning outcomes (LaPointe & Gunawardena, 2004). Students' subject knowledge also impacts group discussion, affecting their ability to engage in meaningful dialogue with others (Beatty, 2002). Student's prior experience may affect perceived student learning (Rovai & Barnum, 2003)

Learning styles. Learning styles impact student interaction and satisfaction. Satisfaction increases as interaction levels rise (Wiens, 2005). Collaboration addresses multiple learning styles (Palloff & Pratt, 2005).

Culture. Culture impacts online group development and process as cultural groups apply their rules for interacting and using artifacts to the online learning environment (Carabajal et al., 2003). Cultural issues include different communication styles, different attitudes toward conflict, and different decision-making styles (Palloff & Pratt, 2005). For example, in Gunawardena et al.'s study (2001), there were differences in perception of online group process and development between participants in Mexico and participants in the United States because of culture differences.

Motivation. Motivation impacts group dynamics, interaction, and satisfaction. Students have a high level of motivation when they have a goal or purpose. Intrinsic interest regarding task refers to the enjoyment people experience when doing a task or their subject interest in the content of task. When intrinsic interest value is high, individuals will be more engaged in the task, persist longer, and be intrinsically motivated for the task (Pintrich & Schunk, 2002).

Group

Group collaboration is influenced primarily by individual students' characteristics. Group collaboration is affected by task affordance, group size, and communication tools.

Task affordance. The type and difficulty of the tasks require different styles of group communication and technology support, which influences and moderates group interaction and group processes. Online collaborative groups require more time to achieve a consensus through CMC (Tu, 2003). There is the risk that a team may not be able to achieve some tasks if appropriate support is missing or too little time is allotted. Johnson et al. (2002) suggest that tasks for online group collaboration should have a clear objective and should not be too complex in order to be accomplished without the option of face-to-face communication. As long as a task is not too easy or too difficult, ratings of task difficulty may motivate students. Task activities influence student motivation, cognition, and satisfaction. Authentic and meaningful tasks, such as real-world problems, provide learners with greater motivation and satisfaction (Carr-Chellman, Dyer, & Breman, 2000; McAlpine, 2000; So, 2006) and enable them to deeply engage in their online learning (Herrington, Reeves, & Oliver, 2005).

Group size. Group size is an important variable affecting group interaction. Creating a group is one of the most important activities related to the success of online groupwork (Graham, 2002; Graham & Misanchuk, 2004). As the number of members in the group increases, so does the diversity of ideas, abilities, opinions, knowledge, and skills. However, in a Web-based learning environment, a large group size may cause difficulty with communication. In addition, organizational problems may become difficult and negatively influence group performance, and non-participation may also increase. A smaller group with a manageable project is more likely to lead to effective collaboration without frustration (Robertson & Hewitt, 2006).

Communication tools. Technology impacts both social presence and social interaction. The affordances of technology may enhance social interaction (Kreijns et al., 2004). Web-based tools provide geographically and temporally distributed students with the opportunity for team

collaboration in a virtual workplace in which tools and structures can be used to control and coordinate group processes. Technical problems may hinder communication between group members, which, in turn, can make collaboration between group members difficult.

Context

Course design. Course structure refers to how well courses are organized and structured in order to enhance student learning. It influences student perceptions of collaboration, social interaction, and satisfaction. Social presence can be promoted through careful course design (Swan & Shih, 2005). Social interaction does not occur automatically, but must be intentionally designed into the instruction. The structure of a course influences interaction (So, 2006; Vrasidas & McIsaac, 1999).

Assessment. When there is an unbalance between individual tasks and group tasks in course evaluation, it may impact the student's academic progress and learning outcomes. Ragoonaden & Bordeleau (2000) offer the following comment: "Collaborative tasks should be an integral element of the course design and should be offered at regular intervals. As much as possible, collaborative tasks have to be evaluated on equal par with individual work" (Ragoonaden & Bordeleau, 2000). Groupwork should be an ongoing process and should not be product-focused (Kosel, 2007; Robertson & Hewitt, 2006). The instructor should evaluate both students' groupwork process and their group product.

Time. One important element in designing courses is the timeframe, including when and how long students participate in collaborative activities. As a factor impacting motivation, time includes the appropriateness of workload and time allotted for completing work. Time constraints impact students' group dynamics and social interaction, since participating in interactive, meaningful discussion activities takes a significant time commitment from students

(Beatty, 2002). From the collaborative learning perspective, when given tight time constraints, individual members seldom have time to share their experiences or collaborate in arriving at their composition. The group effort ends up being more of a cooperative one than a truly collaborative one (Kitchen & McDougall, 1999).

Instructional medium. The instructional medium is an important factor affecting students' perceptions of satisfaction in an online class. The issues and challenges associated with technology are related to the "hardware, software, and network used for experience WBI [web-based instruction], to complete assignments, and enable interaction" (Hill, 2002, p. 73). Technical difficulties can create a high level of frustration among learners (Gabriel, 2004; Song et al., 2004).

Instructor

The instructor's pedagogical style and the design of structuring or scaffolding the course are key factors in determining the nature of the educational process and outcome (Benbunan-Fich et al., 2005). For example, the course requirements for group projects should be clear. The instructor's technology skill or online teaching experience affects the group process and the outcome of online learning. Teachers' philosophies of education and epistemological beliefs will also be reflected in their approaches to teaching and the structures of the course (Vrasidas & Glass, 2002, p. 36). Finally, the instructor's pedagogical strategies impact both social presence and social interaction (Kreijns et al., 2004).

Process Level

Students actively construct knowledge through the processes of negotiating meaning, debating with their team members, and experiencing the multiple perspectives of group members. Through these activities, learners must reorganize their thoughts in order to resolve

conflicts. In particular, when learners are confronted with problems that they cannot solve on their own, these activities enable them to listen to other group members and to receive feedback on ideas through the process of discussion. Thus, the activities in the course provide opportunities for the social interaction and cognitive scaffolding that constructivists see as being essential to higher order thinking.

As a facilitator, motivator, guide and coordinator, the online instructor plays an important role in offering guidance, feedback, and support in online learning environments (Curtis & Lawson, 2001; Fung, 2004; Koh & Hill, 2006). Learners have specific roles and skills they use to collaborate with other group members to reach group goals. An effective collaborative group requires peer support, individual accountability, virtual team skills, leadership, emotional bonding, and building a sense of community. These help the learners engage in meaningful collaborative processes that allow them to better participate in and develop their groupwork.

Factors Impacting the Groupwork Process

Learning

The learning process includes the following factors: feedback and peer support. Both of which are discussed further in the following paragraphs.

Feedback. One factor that influences interaction is feedback. Several researchers suggest that students do not received adequate feedback either from the teacher or from their peers in online courses (Vrasidas & McIsaac, 1999). Peer feedback is necessary for encouraging meaningful interaction (Northrup, 2001, 2002; Woo, 2006). Delayed feedback from the instructor is one challenge in students' online learning experiences (Hara & Kling, 1999; Kim et al., 2005). The students in the online classroom reported that there is a delay factor that can influence learning and interaction in asynchronous communication (Vonderwell, 2003).

Asynchronous student-student review and feedback (Beatty, 2002; Vrasidas & McIsaac, 1999) is influenced by student motivation.

Peer support. Peer support impacts students' experiences with collaborative learning (So, 2006). Students support and help each other to achieve a successful group process and product. Peers support each other through peer relationships among group members. The peer relationship made from both cognitive conflict and emotional conflict affects group development and peer performance (Zhang & Ge, 2006).

Communication

Leadership. Because leadership takes on a different form in virtual teams (Berg, 1999), it becomes a key challenge. A leader will be assigned in order to enable the process to flow smoothly (Palloff & Pratt, 2005). Leaders are acknowledged based on their skills and communication abilities.

Virtual team skills. Online collaborative groupwork requires students to develop specific skills. Many researchers suggest that it is important to develop virtual team skills (Gabriel, 2004; Graham, 2002; Graham & Misanchuk, 2004; Taylor, 2005). Virtual team skills include “an understanding of human dynamics, knowledge of how to manage across functional areas and national cultures, and the ability to use communication technologies as their primary means of communicating and collaborating” (Durate & Snyner, 2001, p. 4).

Accountability. Individual accountability is an essential for successful groupwork. If students do not make a contribution with the group process, this diminishes group satisfaction (Drury, Kay, & Losberg, 2003; Graham, 2002; Graham & Misanchuk, 2004; Slavin, 1995; So, 2006).

Social emotional process

Emotional bonding and sense of community. Emotional bonding with group members is a critical factor in students' perceptions of social presence (So, 2006). The familiarity of group members, informal relationships, and better trust relationships should be promoted (So, 2006a; Tu & McIsaac, 2002).

Trust. Trust is an important factor; group members who can be trusted represent a willingness to rely on other members of the community, as well as confidence in other members of the community. This includes understanding of the impact of the team's work and actions on other people within the team. This helps the group to develop more effectively (Palloff & Pratt, 2005; Tu, 2002).

Outcomes

The outcomes include quality of learning, satisfaction as affected by technology, the pedagogy used by instructors, the expectations and skills of students, social presence, and the nature of the course context.

Learning. Group member learning is an important outcome (Benbunan-Fich et al. 2005). The group process provides opportunities for shared definition of meaning, giving each member opportunities to take advantage of the struggles of the other members to understand, thus facilitating the group members' adaptive process (Koschmann, 1996). Group process affects students' learning. However, despite the success of group projects, the group process may be detrimental to particular areas of student learning. Team building intervention may reduce team learning due to the short-term project's time constraints (Druskat & Kayes, 2000).

Satisfaction. Group member satisfaction is an important outcome (Benbunan-Fich et al., 2005; Carabajal et al., 2003). Students are usually more satisfied with their group when the group

is cohesive rather than non-cohesive (Forsyth, 1998; Hackman, 1992). As group cohesion increases, group dynamics grow stronger. In Whitman et al.'s (2005) study in a graduate engineering course, students in both the face-to-face team and the CMC design teams performed equally well on the final project and reported similar patterns in group processes. However, students in the face-to-face design teams were more satisfied with the group experience than those in the CMC design teams.

Conclusion

As this review has demonstrated, many factors in the input-process-outcome dynamics model influence and contribute to students' learning and satisfaction. In the group working and learning process, group dynamics, social interaction, and social presence all play important roles in enhancing students' learning and satisfaction.

The literature indicates that social interaction and social presence affect group dynamics in students' groupwork in online collaborative learning. Researchers have addressed the importance of social interaction in promoting group dynamics and have pointed out the need for further research in this area. They also have pointed out that building familiarity and establishing community is important in the dynamic context of online learning environments. However, they have suggested few practical strategies on how to promote group dynamics, how to foster social interaction, or how to enhance social presence. Many of these research studies were conducted on general online classes; they were not focused on small group collaborative activities in an online class.

This research suggested critical factors that impact group interactions and offers some strategies on how to promote group interaction for learning. By focusing on an online class that emphasizes small groupwork, I investigated what factors of online groupwork students recognize

as being helpful or challenging in the working and learning process over the course of a semester. Thus this study shed light on the relationship between social interaction, social presence, and the fostering of group dynamics in collaborative learning environments.

CHAPTER III

METHODOLOGY

Overview

The purpose of this study was to explore the experiences of students participating in online groupwork. My intent was to investigate students' perspectives related to small group interactions, as well as their perceptions of the critical factors that impact group interaction. I also sought to find strategies that can be implemented to assist students in completing groupwork online. Specifically, the three main research questions were:

1. What factors of online groupwork do students recognize as being helpful in the learning process over time?
2. What factors of online groupwork do students recognize as being challenging in the learning process over time?
3. What do students suggest can be done in the online learning environment to make their groupwork and collaboration more effective?

Following an overview of the pilot study conducted in the spring and summer of 2005, this chapter is devoted to discussing the research design, research site, sample selection, and data collection and analysis methods for this study. It also addresses issues of the validity, reliability, limitations, and ethical considerations of the study.

Overview of the Pilot Study

A pilot study was conducted during the spring and summer of 2005 using an embedded case study approach. The case was a course in Instructional Technology entitled EDIT 6170: Instructional Design, which has been offered in three ways: face-to-face, online, and blended. The two versions used for this study were online and blended. Both versions required

participants to be involved in a group project. I investigated student experiences by exploring groupwork from the team members' perspectives.

The study adopted mixed methods, using both quantitative (questionnaire) and qualitative (interview and observation) data collection methods to answer the two research questions: (1) What factors of online groupwork do students recognize as helpful in the working process? and (2) What factors of online groupwork do students recognize as challenging in the working process? My primary data were gathered through an interview process. In this study, fifty-six participants completed the questionnaire, including 37 who took the synchronous online course and 19 who took the blended course. Twelve students were interviewed; seven were enrolled in the online course and five were enrolled in the blended course. The participants were observed during the Saturday face-to-face workshops in the blended delivery session. Data were analyzed using a combination of quantitative and qualitative research methods. The survey data were analyzed using SPSS, while interview data were analyzed and interpreted using constant comparative methods to recursively draw themes (Charmaz, 2002; Strauss & Corbin, 1990).

In the pilot study, the most helpful factors for student groupwork overall were building familiarity with group members, receiving prompt feedback and help with group formation from the instructor, and developing time management skills. Challenges in understanding course goals, communication, and a perceived lack of community created difficulties. There were differences between the synchronous online course and the blended course regarding helpful factors and challenging factors. Most of the students in the synchronous online course encountered more challenges than did the students in the blended course because of the absence of face-to-face meetings, which led to difficulty communicating and a perceived lack of community.

Overall, data collection procedure and data collection methods worked well in the pilot study, and the findings were valuable. However, the pilot study revealed weaknesses concerning methodology, including the data collection methods and the research site. To overcome these limitations, I enacted some changes regarding the present study. These changes are described in the following paragraphs.

The first change was to enhance the data collection methods. The interviews that were conducted soon after the class ended were very useful. The interviews conducted several months after the class ended were less useful, as students then had more difficulty recalling their perceptions and feelings regarding their groupwork experiences. In the pilot study, students in the same group had different perspectives and different levels of satisfaction with their groupwork. The present study included focus group interviews in addition to individual interviews, which provided the opportunity to hear the voice of the whole group. Monthly observations, monthly interviews, and focus group interviews were added to the data collection, shedding light on what factors students recognized as being helpful or challenging over time.

Second, the time frame for data collection was changed. Most participants who took the short summer session (four weeks) perceived a lack of time and a heavy workload as being challenging. They wanted to finish their groupwork very quickly. It was difficult to investigate the student groupwork process during such a short time period. A full semester was needed to investigate the student groupwork and group interaction processes in a more in-depth manner.

Third, the interview protocol was enhanced based on the pilot study. Three types of interview (individual monthly, individual end of course, and focus group) were used for data collection in this study. Interview protocols were enhanced based on the protocols of the pilot

study. The present study used three types of interview protocols, according to the interview purpose and the interview period (see Appendix A).

Overview of Research Methodology

Qualitative research is defined as “an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting a detailed view of informants, and conducted in a natural setting” (Creswell, 1998, p. 15). Qualitative research methods are used to gain a deeper understanding of the causes of social phenomena. Qualitative methods emphasize the qualities of entities, processes, and meanings that are not experimentally examined or measured.

In educational technology, the use of qualitative research methods has increased. In the last decade, educational technology scholars have focused on areas such as “instructional setting, interactions and views of participants, and the politics or economics of the reality of a complex learning situation” (Savenye & Robinson, 2004, p. 1067). Such areas are best explored using qualitative methods. Indeed, Luekehans and Robins (2000) have argued that qualitative research represents not simply a methodology, but a worldview, paradigm, or perspective.

Different authors define and categorize qualitative research in different ways (e.g., (Creswell, 2003; Denzin & Lincoln, 2000; Merriam, 1998; Patton, 2002). In educational research, five types of qualitative research are commonly used—basic or generic qualitative study, ethnography, phenomenology, grounded theory, and case study (Merriam, 1998). Though there are some differences between them, Merriam notes that these approaches share some essential characteristics of qualitative research:

- the goal of eliciting understanding and meaning,
- the researcher as primary instrument of data collection and analysis,

- the use of field work,
- an inductive orientation to analysis, and
- findings that are richly descriptive (p. 11).

The strength of qualitative methods is that they help researchers study issues in depth and in detail. Approaching fieldwork without being constrained by predetermined categories of analysis contributes to both the depth and the openness of qualitative inquiry. The use of qualitative methods typically produces “a wealth of detailed information about a much smaller number of people and cases...[and] increases the depth of understanding of cases and situation” (Patton, 2002, p. 14). Given the goals of this study, qualitative methods were the most appropriate form of inquiry.

Case Study

Case study is not a methodological choice, but a choice of what is to be studied. A case study strategy is preferred when “‘how’ or ‘why’ questions are being posed, when the investigators have little control over events, and when the focus is on contemporary phenomenon within some real-life context” (Yin, 2003, p. 1). A case study’s epistemological question is “What can be learned from the single case?” (Stake, 2000, p. 436). Case study research can involve the close examination of people, topics, issues, or programs. The purpose of case study research is to generate knowledge of the particular and answer “focused questions by producing in-depth descriptions and interpretations over a relatively short period of time, perhaps a few weeks to a year” (Hayes, 2004, p. 218).

Compared with other qualitative researchers, a researcher performing a case study has the responsibility of building the case and conceptualizing the object of study (Stake, 2000). To select a case, the researcher may use categories such as convenience, access, and geographical

proximity (Yin, 2003). Patton (2002) notes that the researcher must “select information-rich cases strategically and purposefully, but the specific type and number of cases selected depends on the study purpose and resources” (p. 243). There are no rules for sample size in qualitative inquiry. In-depth information from a small number of people can be very valuable, if the cases are information rich.

Case study research can also be consuming for the researcher. Because it is an in-depth study, it is highly personal. Conducting effective case studies is difficult because investigators may not follow systematic procedures and because it is difficult to screen or test an investigator’s ability to do good case studies (Yin, 2003). In addition, case studies can exaggerate a situation that the writer wished could be explained, thus leading the reader to biased conclusions. Therefore, both the readers and the authors need to “be aware of biases that can affect the final product” (Merriam, 1998, p. 42). The issues of reliability, validity, and generalizability are also important when conducting a case study (Patton, 2002).

Research Design

This study used a qualitative embedded case study design that employed multiple methods (survey, interview, observation, and artifact collection) to explore students’ perceptions of the group interaction process in a particular case rather than to evaluate students’ outcomes. The goal of qualitative research is to understand the phenomenon or process under study from the participants’ perspectives (Merriam, 1998). A case study is employed to explore a program, event, activity, process, or one or more individuals in order to gain deep understanding. The interest lies “in process rather than outcomes” (Merriam, 1998, p. 19). This study was aimed at understanding the student groupwork context, identifying how students collaborate with group members and investigating students’ perceptions of groupwork in a Web-based learning

environment. Therefore, case study was an appropriate methodology for this study, as a case is a specific, unique, bounded (Patton, 2000), and integrated (Stake, 2000) system that provides rich and in-depth description (Merriam, 2002). The case in this study was a group of students in a graduate-level course supported by a Web-based learning system. This case was instrumental in providing an understanding of how to facilitate Web-based collaborative learning in an online environment.

Research Site and Participants

To select cases, purposeful sampling was used for this study within a Web-based collaborative learning environment. Purposeful sampling is based on the assumption that there is a particular area about which the researcher wishes to gain insight; therefore, the researcher “must select a sample from which the most can be learned” (Merriam, 1998, p. 61). Patton (2000) offers the following explanation: “The logical power of purposeful sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry, thus the term purposeful sampling” (p. 230). In purposeful sampling, the researcher determines what selection criteria are essential in choosing the participant or research sites. These criteria for purposeful sampling directly reflect the purpose of the study and guide in the identification of information-rich cases (LeCompte, Preissle, & Tesch, 1993; Merriam, 1998).

Based on the purpose of the study and the results from the pilot study, a site was selected, and within that site, a few specific cases were chosen. The criteria for selecting the research site and cases are provided in the following sections.

Site Selection

1. The course should have a group assignment completed by student groups because this study sought to explore how students interact with other students to complete group projects.
2. The course should be offered online and make use of a Web-based collaborative tool. In particular, students should participate in discussion and chat in the Web-based learning environment.
3. The course should be offered at the postsecondary level. This was essential because the purpose of the study was to investigate postsecondary students' group projects in a Web-based learning environment.
4. The instructor should have a minimum of two years experience with teaching online.

Case Selection

Based on the purpose of this study, I used the following criteria to select specific cases:

1. The participants in the course should be involved in a group project as a member of a team.
2. The participants must be willing to complete a background survey and participate in four 30-minute face-to-face interviews. The participants must also be willing to be observed in a face-to-face or online setting 2-3 times each month for four months, providing them time to critically reflect on their groupwork experiences.

Context (Setting and Course Information)

The course used in this study is required for a master's degree in instructional technology and is only offered online. The course was supported by the HorizonWimba® and WebCT® online learning platforms, and it was offered in the spring and fall semesters. Students met

predominantly synchronously for two and one half hours one night each week in January and February, and they met primarily asynchronously in March and April.

Course Goal and Objectives

The course used in this study covers theoretical and research foundations of emerging perspectives on learning, teaching, and human performance, with an emphasis on the ways that technological environments can be designed to support these areas (see Appendix B for the course syllabus). Students in this class are expected to conduct comprehensive readings of relevant literature, examine and critique representative learning technologies, give two in-class presentations, moderate a class discussion dealing with a current theoretical or research issue associated with learning or performance support, and complete either a substantive literature review or a high-level design of an instructional problem where one of the models discussed in class is applied. The instructional problem may be a training or classroom problem. Students needing a problem to work with are provided with one by the professor. The linking of theory-to-practice and practice-to-theory is a major theme of this course.

There are three main objectives for the course:

1. Explore the foundations and assumptions of technology-enhanced approaches to learning, teaching, and human performance,
2. Critically examine the literature on emerging applications of technology, and
3. Articulate principled technological approaches with the potential to address current educational problems and/or to substantively enhance learning, teaching, and human performance.

Course Flow

In the online class, during Phase 1, the instructor provided students with one slide related to a learning theory, which he explained. The slide included a challenge and applications of the learning theory in an authentic context. Following the presentation, students moved into break-room in HorizonWimba®, working in their online groups for 20 to 30 minutes where they discussed the applications of the theory and provided three suggestions related to the challenges for the theory. After the group discussion, the students came back to the main online classroom, where one of the group members presented the group's ideas.

During Phase 2, also called the “OR” part of the syllabus, each group chose to read one of two possible chapters for that week. Using any communication tool they desired, each group was required to come up with a lesson plan idea that used the theory about which they read. They were required to write and revise the lesson plan until the whole group was satisfied with the lesson. The final lesson plan was then posted in the public area of that particular theory in the discussion board in WebCT®.

Assessment

The EDIT 6400 course (*Emerging Perspectives on Learning, Teaching, and Technology*) includes both individual tasks (e.g., lesson plan, literature review) and group tasks (e.g., e-book improvement, book chapter). Table 3.1 shows the requirements of the course.

Table 3.1. Requirements of the Course

Task	Points
e-Book Improvements	100
Draft of lesson plan or literature review (100 points) Lesson plan or literature review (150 Points) – OR – Book chapter (250 Points)	250
Class attendance, participation, PowerPoint slides, weekly readings, watching videos	140
Self-assessments	140
Total	630

Participants and Groupwork

The eleven participants in this study were enrolled in taking the EDIT 6400 course in the spring of 2007. Ten of eleven students were enrolled in an instructional technology degree program. Students were required to be involved in a small group (3 to 4 members per team) based on their educational interests. For their collaborative project, groups were formed during an initial face-to-face meeting that took place on the first day of class. Students were provided with many opportunities to get to know each other through a variety of activities during the first class (e.g., asking educational interest areas, such as K-12, higher education, and business industry; sitting together and talking within an interest group).

The final three groups consisted of three to five students. Group One consisted of three students and focused on K-12 with a language arts/school library focus. Group Two consisted of three students and focused on K-12 without a language arts focus. Group Three consisted of five students and focused on business and industry/higher education. Group Two and Group Three

chose a project leader or coordinator for the group project, and all group members in Group One rotated the leader role.

The focus of this study was to examine the voices and perspectives groups rather than the class as a whole. While there were three groups in the class, not all of the members of the third group were available to participate in interviews. Therefore, the data from this group was omitted from this study. The remaining two groups, Group One and Group Two, were selected as cases. All group members in the two groups participated in a background survey, four individual interviews, and one group interview after signing consent forms (see Appendix C).

The students were provided with an overview of the group project during the initial face-to-face meeting. They were required to be involved in several groupwork activities (see Appendix B). They were also required to do the following tasks:

- Create some instructional figures, video, or interactive elements for the ebook.
- Discuss theory applications in a break-out room each week in the live classroom.
- Discuss theories on the WebCT® Bulletin Board during the OR portion of the class.
- Provide group members with constructive feedback on their lesson plans prior to submitting them to the instructor.
- Everyone in your group must be following the same curriculum.

Table 3.2 shows the topics for each educational interest group.

Table 3.2. Topics for Each Educational Interest Group

	Business and Industry/ Higher Education	K-12 with a focus on Language Arts/School Library	K-12 without a Language Arts Focus
March 6	Cooperative Learning	Cooperative Learning	Cooperative Learning
March 20	Adult Learning/Bloom	Resource-based Learning	Resource-based Learning
March 27	Experiential Learning	Multiple Intelligence	Multiple Intelligence
April 3	Transformative Learning	Creativity/Bloom	Conceptual Change
April 10	Computer-mediated Instruction	Reciprocal Teaching	Computer-mediated Instruction
April 17	Learning Communities	Reading Recovery	Cognitive Tools
April 24	Affective Domain	I-Search	Six c's of Motivation

Table 3.3 provides an overview of the characteristics of each group. For a group project, Group One decided to create a narrative PowerPoint presentation summarizing the Reading Recovery (RR) chapter (http://www.coe.uga.edu/epltt/Reading_Recovery.html) and to create quizzes for the RR and I-Search chapters. Each group member was asked to provide his or her group with constructive feedback on their individual lesson plans and to get feedback from the other group members. Group Two decided to rewrite the Cognitive tools Chapter (<http://www.coe.uga.edu/epltt/cogTools.html>) because they felt the previous chapter read very poorly and needed to be rewritten. The revised chapter included the following contents: Background, Benefit and challenges, Research, and Scenario. The three members took three parts that were all interconnected. This group was not required to make an individual lesson plan or to get a feedback regarding the lesson plan.

Table 3.3. Group Characteristics

	Group One	Group Two
Group Size	3	3
Group-specific Characteristics	<ul style="list-style-type: none"> All physically separated distance learners (Centerville, Rome, and Gwinnett) All have teaching experience (two teachers and one previous teacher) Three members have experience working in online groups. Two members worked in the same group 	<ul style="list-style-type: none"> All physically separated distance learners (Two Gwinnett and one Athens) All have teaching experience (two teachers and one previous teacher) Two members have prior online group experience in the same group
Age	<ul style="list-style-type: none"> Three students aged 26-35 	<ul style="list-style-type: none"> Three students aged 36-46
Ethnicity	<ul style="list-style-type: none"> Three Caucasian 	<ul style="list-style-type: none"> Two Caucasian and one African American
Gender	<ul style="list-style-type: none"> Two females and one male 	<ul style="list-style-type: none"> Two females and one male
Group meetings	<ul style="list-style-type: none"> Several online group meetings in Horizon Wimba® after the class and during the group's breakout activity during Phase One No group meeting during Phase Two 	<ul style="list-style-type: none"> One online group meeting in Horizon Wimba® during the group's breakout activity during Phase One One online group meeting in HorizonWimba® at 5:00 on Tuesday during Phase Two
Communication Mechanisms	<ul style="list-style-type: none"> Email in WebCT® Private email Telephone between two females in the group HorizonWimba® 	<ul style="list-style-type: none"> Email in WebCT® HorizonWimba®
Group Project	<ul style="list-style-type: none"> Creating narrated PowerPoint presentation summarizing the Reading Recovery (RR) chapter Creating quizzes for RR and I-Search) 	<ul style="list-style-type: none"> Rewriting Cognitive tools Chapter

For a group project, each team was assigned a specific group space using a bulletin board and chat room. During synchronous online chatting, students had a virtual group meeting to

discuss their projects. The asynchronous discussion board enabled group members to post and share information and to communicate with each other (e.g., sharing information, presenting and providing feedback on each other's work). However, the use of those online spaces was voluntary.

Instructor as Facilitator

The course instructor was a faculty member who had taught EDIT 6400 since 1998. The instructor was a facilitator who supported individual and collaborative learning. The instructor's role included making comments, providing feedback to students on their lesson plans and group e-book improvements, and providing clear objectives, various guidelines, templates, and detailed explanations of group processes.

Instruments

A number of instruments were used during this study. A survey facilitated exploring and understanding participants' backgrounds, such as online learning experiences, groupwork experiences, and levels of subject matter expertise (see Appendix D). Prior to conducting the interviews, an interview guide was created to guide the exploration of with the participants (Patton, 2002). The interview guide worked as a basic checklist during the interviews to make sure that all relevant topics were covered, and it made the interviews more systematic and comprehensive (see Appendix A). Observation protocol and guide (see Appendix E) were also used to check students' physical settings, activities, interactions, and conversations. The observation protocol also allowed for the notion of subtle factors that may be important, such as a participant's look of discomfort.

Data Collection

This study used a background survey, interviews (with students and group), observations, and archival documents as sources of data. Table 3.4 illustrates how the instruments enabled data collection to address the research questions.

Table 3.4. Research Questions and Data Sources

Research Questions	Data Sources
1. What factors of online groupwork do students recognize as helpful in the learning process over time?	Background survey, interviews, observations artifacts
2. What factors of online groupwork do students recognize as challenging in the learning process over time?	Interviews, observations, artifacts
3. What do students suggest can be done in an online learning environment to make their groupwork and collaboration more effective?	Interviews, observations

Background Survey

A background survey consisting of fourteen items was used to collect basic information about the students (see Appendix D). In addition to the personal demographics information (e.g., name, major, gender, age, ethnicity, and school/work status), the background survey was conducted to measure students' levels of experience for class-related topics, computer mediated technology, online learning, and groupwork. It was also used to determine the number of distance courses taken by students. The student background survey was the major source of demographic information about the participants and for determining individual differences in how they perceived their levels of experience.

Interviews

Interviews allowed the researcher to “enter into the other person’s perspective, to find out what is in and on someone else’s mind, and to gather their story” (Patton, 2002, p. 341). The

interviews complemented the data provided from observations and artifacts to answer the research questions. Patton (2002) mentioned that there are three approaches to the design of interviews: the informal conversation interview, the semi-structured interview guide approach, and the standardized open-ended interview. The semi-structured interview approach, which was used in this research, involves “outlining a set of issues that are to be explored with each respondent before interviewing begins” (p. 342). Although the semi-structured interview approach allows the researcher to focus on points of interest, it also allows a degree of flexibility, enabling the interviewer to follow up and expand on answers.

In order to investigate students’ perceptions of groupwork, the primary data source was the transcripts of interviews, which were an important way to listen to the learners. For this study, three thirty- minute monthly and one sixty-minute final interviews with each of six students in an online course were conducted to discover what students perceive as being helpful or challenging in groupwork over time/across the class. A final face-to-face interview was conducted to obtain data regarding the students’ perceptions of groupwork in an online class and to solicit their advice for new learners and online instructors on how to facilitate student online groupwork (see Appendix A for the interview questions and protocols). For this study, six students in two groups (three members each) were interviewed. In addition, a peer researcher conducted two focus group interviews based on focus group interview guidelines (see Appendix A for the interview questions and protocols), which kept interactions centered while allowing individual perspectives and experiences to emerge (Patton, 2002). These semi-structured interviews were designed to discover what students perceive as being helpful or challenging in groupwork over time/across the class. The following are examples of the questions posed to the students during interviews:

1. Think about a time during the past month when you participated in your groupwork.
Could tell me about your groupwork experiences in groupwork in the online course?
Describe them for me.
2. What is good about your collaboration with group members?
3. What challenges have you faced in your collaboration during the past month?
4. Could you give me your examples of challenges you have encountered in your collaboration with group members?
5. Can you tell me about your sense of connection with group members?
6. Can you tell me about your collaboration with group members? Can you tell me about how your group communicates?
7. What suggestions would you make to a student working in a group based on your experiences during the past month?
8. What suggestions would you give to an instructor on how to facilitate student groupwork?

The interviews were tape recorded and then transcribed. Immediately after each interview, I recorded my observations on the interview process as well as my reflections. To improve the accuracy of the transcripts, one native English speaker checked for the errors and corrected any inaccuracies.

During the first month of class, one 30-minute face-to-face interview was conducted with each of the six participants between February 2 and February 15. The primary purpose of the interview was to explore the students' reflections on their groupwork experiences during the first month how to facilitate student groupwork in an online learning environment? Questions asked during the interview were based on semi-structured interview protocol.

During the second month of class, one 30-minute face-to-face interview was conducted with each of the six participants between March 1 and March 10. The primary purpose of the interview was to investigate each student's reflections on his or her groupwork experience during the second month. Questions asked during the interview were based on semi-structured interview protocol.

During the third month of class, one 30-minute face-to-face interview was conducted with each of the six participants between April 4 and April 9. The primary purpose of the interview was to explore participants' groupwork experiences during the third month. Questions asked during the interview were based on semi-structured interview protocol.

During the fourth month of class, one 60-minute face-to-face interview was conducted with each of the six participants between April 26 and May 5. The primary purpose of the interview was to gather participants' reflections on their groupwork experiences during the fourth month. This interview was also based on a semi-structured interview protocol. In addition, this final interview was used to obtain data regarding the students' perceptions of groupwork in an online class and to solicit their advice for new learners and online instructors on how to facilitate student online groupwork based on final interview protocol (see Appendix A for the interview questions and protocols).

Focus group interviews with each group were conducted by a peer researcher. The purpose of the focus group interview was to hear the voice of the group as a whole. Questions asked during the focus interview include the following:

- What factors do you think affect student interaction in your online groupwork?
- What factors do you think affect group dynamics?
- What makes you feel satisfied with your experience doing groupwork?

- What challenges do you think you have faced in doing student groupwork? Could you tell me about your experiences?
- What has been good about your collaboration with your group members?

Participant Observations

Observations enable researchers to gather firsthand data on a program, processes, or behaviors being studied. Observational data are used for the purpose of describing “the setting that was observed, the activities that took place in that setting, the people who participated in those activities, and the meanings of what was observed from the perspectives of those observed” (Patton, p.2002, p. 262). Observations can lead to deeper understandings than interviews alone, because they provides knowledge of the context in which people interact, and may allow the researcher both to see things that escape awareness among the people in the setting and to learn things that participants would be unwilling to discuss in an interview (Patton, 2002).

To conduct observations, I used the observation protocol and guide (see Appendix E). I observed all participants on the first day of class (the face-to-face meeting) and two groups two each month during the synchronous online portion of the course. The purpose of the observations was to see group formation and the participants’ interaction.

At the beginning of semester, during the first face-to-face classroom observation, I observed how students formed their groups and what factors they recognized as being challenging at the beginning of their groupwork experience.

In January and February, I conducted two participant observations each month of two groups to investigate their group interaction processes and their perceptions. I focused more deeply on the students’ group interactions. I also investigated how they felt about their

groupwork in an online class and what factors they found challenging regarding their groupwork in an online class. I observed as an onlooker (according to Patton's definition) since I observed their activities in a synchronous online meeting through Horizon Wimba®.

In March and April, because the communication mode changed from a synchronous online learning environment (that is, HorizonWimba®) to asynchronous online learning environment (bulletin board in WebCT®), I did not observe students' group meeting.

At the end of the group project, after completing a group interview with each group, I observed group interactions to seek answers to the following questions: How did they complete their groupwork? How did they feel about their group members and their work? What factors challenged them in their online groupwork in an online class at the end of class?

Archival Research

Merriam (1998) states that artifacts are "a wide range of written, visual, and physical material relevant to the study at hand" (p. 112). Artifacts are important because of what can be learned directly from them. In addition, they open paths of inquiry that can be followed only through direct observation and interviewing (2002). Artifacts often provide insights into a setting and/or group of people that cannot be observed or revealed through an interview.

In this study, the archival data that were collected include the course syllabus, reading materials (articles), group products, bulletin board postings, and the chat log from the online class website, focusing specifically on information related to groupwork. The transcripts of the bulletin board and chat discussion were gathered as text files at the end of the course. These artifacts were collected with the permission of the instructor and students. However, participants did not use a bulletin board as their group spaces. They just used their group bulletin board when they posted their weekly assignments and got a feedback on their project from their group

members. Therefore, transcripts of the bulletin board and chat discussion provided little information about group cohesion, group collaboration, and the level of group interaction. In this case study research, these artifacts were used to supplement data gathered through interviews and observations (Merriam, 1998). Table 3.5 presents data collection procedure and schedule

Table 3.5. Data Collection Procedure

	Monthly interviews with online students	Background survey	Observation	Archival data	Focus group with online group
January	1 face-to-face interview with each of the six participants (Feb 2-15)	1 survey of each of the six participants	2 observation of each group (one first day face-to-face meeting and one online)	Data collection following observation	
February	1 face-to-face interview with each of the six participants (March 1-10)		2 observations of each group (online)	Data collection following observation	
March	1 face-to-face interview with each of the six participants (April 3-10)			Data collection following observation	
April	1 face-to-face interview with each of the six participants (April 29 -May 6)		1 observation of each group (online)	Data collection following observation	1 focus group with students in 2 groups (online)

Data Analysis

Inductive analysis methods were used to analyze the data because they are most appropriate for discovering categories, patterns, and themes indicated by the data and for helping to explain a phenomenon and build theory about the phenomenon. In depth analysis was completed on a survey, interviews and observations; informal analysis was completed on the

artifacts to inform the overall context. Initial data analysis occurred as data were collected (Merriam, 2002).

This study used LeCompte's (2000) and Miles and Huberman's (1994) qualitative data analysis models to analyze the data. First, as "Tidying up" is the first step to coding and analyzing data, I arranged the data in file folders in the computer and reviewed and confirmed research question (LeCompte, 2000). In-depth data analysis involved three major activities: data reduction, data display, and conclusion drawing and verification (Miles & Huberman, 1994). Data reduction refers to "the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written up field notes or transcriptions" (Miles & Huberman, 1994, p. 11). I used "open coding" (Strauss & Corbin, 1998) through which I analyzed the transcribed sentences, names events and actions, and constantly compared them with one another to determine which belonged together.

Prior to open coding, I read the participants' interview transcripts twice. After the first monthly interview, I began creating a tentative list of categories based on my research questions, my literature review, the results of the pilot study, and key concepts that emerged from reading the transcripts. For example, a tentative list of categories included helpful factors, challenging factors, strategies for students, and strategies for instructors. A tentative list of subcategories included individual factors (learning style, background, and technology skill), group factors (group size, task, communication tool, accountability, a group leader's leadership, feedback, and sense of connection), technology, group process, and course design. I used this tentative list to guide further analysis of data because I did four rounds of interviews. The categories and subcategories that emerged from open coding were changed, merged, and refined through an iterative process of coding.

Constant comparative methods were used to analyze and interpret the twenty-four interviews and two focus group interviews conducted. After completing each monthly interview, I coded the six transcripts one by one. The purpose of this process is to reduce data to “units of analysis” (LeCompte, 2000). I began coding my data using a line by line coding approach. I read each transcript line by line while I was thinking about my research purpose and questions. During this open coding, I broke the data into “the smallest piece of information about something that can stand by itself” (Lincoln & Guba, 1985, p. 345). I coded emerging incidents, ideas, objects, etc., with words or short phrases based upon the meanings or images they evoked (LeCompte, Preissle, & Tesch, 1993). I coded on paper and then electronically by creating a Microsoft Word file of each participant’s interview transcript. I worked on each transcript and saved it as a different name. I highlighted or underlined interesting points from participants’ answers. At the same time, I wrote down all the codes and my direct interpretations in the margin of the transcript and also listed them in a separate word document for convenience.

Then I cut and pasted each transcript and organized it in Microsoft Word according to the interview questions (for example, overall experience, helpful factors, challenging factors, sense of connection, communication, student strategies, and teacher strategies). I read the transcripts in the Word file and also wrote down all the codes on the right side of column (see Appendix F). Then I summarized the main themes of each transcript together with supporting excerpts from the transcripts in a Microsoft Word file for each individual. After each monthly interview, I summarized the interview data regarding each individual, group, and the whole dataset. I then updated the list of sub-categories and codes. This helped me compare the identified events and actions from one participant with those from others and also the events and actions of one group with the other group for difference and similarity. During the four rounds of interviews and the

two group interviews, codes were added, deleted, and grouped together to form categories and sub-categories. I created a list of the codes developed through the analysis of the interview transcripts.

Data display is the second element or level in Miles and Huberman's (1994) model of qualitative data analysis. Data display goes a step beyond data reduction to provide “an organized, compressed assembly of information that permits conclusion drawing” (p. 11). A display can be an extended piece of text or a diagram, chart, or matrix that provides a new way of arranging the more textually embedded data.

In this phase of the data analysis process, I compared the similarities and differences among the codes in order to define my categories. I studied my list of initial codes and conducted focused coding, which involves sorting and synthesizing large amounts of data. Focused codes are more abstract, general, and analytically incisive than many of the initial codes as Charmaz (2002) addressed. As I compared the similarities and differences in the students’ perceptions, I created categories and sub categories. I built a list which contains a description of each code as shown in Table 3.6 (see sample in Table 3.6; complete Code List is in Appendix G).

Table.3.6. Sample of Code List

Categories	Sub-categories	Codes	Definition
Helpful Factors	Individual Characteristics	Previous experience	<ul style="list-style-type: none"> • Participating in general online class • Participating in group work in face-to-face setting • Participating in group work in an online learning environment
		Previous CMC experience	<ul style="list-style-type: none"> • Being comfortable with technology
		Work habits	<ul style="list-style-type: none"> • Self-disciplined • Sharing equal responsibility among group members

During this data display process, I constantly compared the categories and codes (Strauss & Corbin, 1998) generated across the six participants from the four rounds of individual interviews and the two group interviews. The comparison led to addition, deletion, and refinement of categories and codes.

Conclusion drawing, the last stage of the data analysis, involves making decisions about the meaning of the data and the validity of findings. Conclusion drawing also involves stepping back to consider what the analyzed data mean and to assess their implications for the questions at hand. Verification, integrally linked to conclusion drawing, entails revisiting the data as many times as necessary to verify these emergent conclusions. Miles and Huberman (1994) note that “the meanings emerging from the data have to be tested for their plausibility, their sturdiness, their validity” (p. 11). In this stage, I continued to seek to compare and contrast cases to identify patterns and regularities. I looked at the data as many times as necessary to verify these emergent conclusions. I also explored codes, sub-categories, and categories over and over again to go beyond coding to interpretation.

Writing was also an extension of the data analysis. While I wrote the findings section, I found some unstable codes or irrelevant data. I revisited my original data, individual data analysis summary, monthly summary, whole data summary, displayed data, and the interpretation and conclusion. In this way I could identify more enduring patterns and themes and could provide stronger findings. Finally, I reached a preliminary conclusion. However, to support a final conclusion, I reviewed the categories and sub-categories in the code list again. Then I decided to add or delete codes. Based on my analysis, I developed a diagram (see Chapter 5, Figure 5.2) that showed that relationship among subcategories and codes and described the overall conclusions of this study.

Validity and Reliability

Like most research studies, this case study has issues related to internal validity, external validity, and reliability. Internal validity refers to “the question of how findings match reality” (Merriam, 1998, p. 201). Merriam (1998) suggests six strategies to enhance internal validity: triangulation, member checks, long-term observation, peer examination, participatory modes of research, and identification of researcher biases. External validity refers to how “the finding of one study can be applied to other situation” (Merriam, 2002, p. 207). According to Merriam (2002), providing rich, thick description is a major strategy to ensure external validity in that the researchers is “providing enough description so that readers will be able to determine how closely their situations match the research situation, whether findings can be transferred” (Merriam, 1998, p. 211).

Reliability deals with “the extent to which researcher findings can be replicated” (Merriam, 1998, p. 205). In qualitative inquiry, reliability is not whether findings will be found again, but “whether the results are consistent with the data collected” (Merriam, 1998, p. 206). Merriam (1998) suggests three strategies to enhance reliability: stating the investigator’s position, implementing triangulation, and using an audit trail. Therefore, to enhance validity and reliability, I used several strategies: identifying my position and my biases as the investigator, data triangulation, member checks, and peer examination. I also provided thick, rich descriptions of the data. Each strategy is further described below:

- *The researcher’s position* is defined as “critical reflection by the researcher regarding assumptions, worldview, biases, theoretical orientation, and relationship to the study that may affect the investigation” (Merriam, 2002, p. 31). I addressed these factors in section related to researcher’s assumptions.

- *Data triangulation* is defined as “using multiple sources of data or data collection methods to confirm emerging findings” (Merriam, 2002, p. 31). Data were collected from multiple sources including a background survey, observations, interviews (individual and group), and artifacts.
- *Member checks* is defined as “taking data and tentative interpretations back to the people from whom they were derived and asking if they were plausible” (Merriam, 2002, p. 31). I asked group members in each group to review interview transcripts to be certain I had captured what they meant to say. One member of each group participated in the member check process.
- *Peer examination* is defined as “discussions with colleagues regarding the process of study, the congruency of emerging finding with raw data, and tentative interpretation” (Merriam, 2002, p. 31). Two doctoral students who were native English speakers and used qualitative research design method for his/her dissertation served as peer examiners.
- *Rich, thick descriptions* allow readers to “be able to determine the extent to which their situation matched the research context, and hence, whether findings can be transferred” (Merriam, 2002, p. 29). A thick, rich description of the expertise and experiences of interview participants were provided so that readers may framework the findings of the study and decide if they apply to their students’ groupwork in online classes.

Ethical Considerations

Regarding ethics in research, there are several issues that researchers should consider. First of all, my research was approved by the university’s Institutional Review Board (IRB) (see Appendix H). Before interviewing and observing the HorizonWimba® Virtual classroom and WebCT® bulletin board, I provided the participants with written information about my research

goals, processes, and potential risks, and enough time to consider whether or not to consent to the interview. Then I obtained consent from students (see Appendix C).

To protect the privacy of the research participants, I did not use participants' real names in the dissertation, but gave each participant a pseudonym, which was used in the labeling of tapes and transcripts. No discomfort or stress was anticipated during this research. However, as interview data may be quite personal, there was a chance that the participants would become uncomfortable and elect to withdraw their participation. Participations were informed that they could cease their participation in the study at any point.

Researcher's Assumptions

In qualitative research, a researcher plays an important role in data collection and analysis (Merriam, 1998; Patton, 2002). As a researcher is the primary instrument, qualitative data depends on the researcher's "skills, training, insights, and capabilities" (Patton, 2002, p. 441). Qualitative analysis depends on the researcher's intellect and style (Patton, 2002). Therefore, the researcher's subjectivities statement is important because it makes the researcher aware of how his or her own assumptions might influence data analysis.

It is important to discuss my epistemological beliefs and professional experiences because of the potential impact they may have had on this study. Various factors in my background relate to this groupwork study in a Web-based learning environment: 11 years of professional experience during which I was always involved in group projects and have developed several educational systems. My four years in the master's program and Ph.D. program in instructional technology have also influenced my beliefs about learning and online environments.

In terms of my theoretical perspectives, my research is based on social constructivism (Vygotsky, 1978). I believe that the greatest learning occurs when students are able to construct their knowledge actively through the process of negotiating meanings with others rather than through the transfer of knowledge (Jonassen et al., 1995). I believe that a web-based learning environment is a place where students should be encouraged to construct their own ideas, and to develop and enhance their critical thinking skills. I conducted this study in hopes of better understanding how students interact with group members in a Web-based learning environment, investigating what they perceive as challenging regarding their group work, and determining what can be done to assist students with online groupwork.

Summary

In this chapter, I described the methodological design for this study. The design is a case study which used survey, interviews, observations, and archival documents as sources of data. I collected comprehensive data related to factors participants perceive as being helpful and challenging in groupwork in an online course. The research site was an online course that matches the criteria described earlier in this chapter. I sought six students in two groups as participants to engage in the study over a four month period (16 weeks). Throughout the data collection period, I protected my participants ethically as previously outlined. Data analysis defined categories, themes, and patterns by developing hypotheses and evaluating data. To enhance validity and reliability of this research, I used several strategies: identifying my position and my biases as the researcher, data triangulation, member checks and peer examination.

CHAPTER IV

FINDINGS

Overview

The previous chapter provided a description of the research methods employed for this study. In this chapter, I describe the results of data analysis. The study was designed to investigate students' perspectives related to small group interactions as well as their perceptions of the critical factors which impact group interaction for learning. I also sought to identify strategies that can be implemented to assist students in completing groupwork online.

Specifically, the three research questions were:

1. What factors of online groupwork do students recognize as being helpful in the learning process over time?
2. What factors of online groupwork do students recognize as being challenging in the learning process over time?
3. What do students suggest can be done in the online learning environment to make their groupwork and collaboration more effective?

To answer the research questions, several data sources were used during analysis. These resources included participants' background surveys, individual face-to-face interview transcripts, online group interview transcripts, the chat log from HorizonWimba®, and observation notes.

This chapter begins by providing a brief description of the participants in the two groups, as well as an overview of group formation and group interaction. Next, I present themes (Individual Perceptions in each group) that emerged from an inductive analysis of each individual's data. Finally, I provide a cross case analysis of the two groups. In this cross case

analysis, I present the helpful factors the participants perceived over time, the challenges they perceived over time, and their recommendations for future online collaborative groupwork.

Summary of Course Flow

The online course had two phases (Phase One and Phase Two) of course flow. In Phase One, the students met every Tuesday at 5:00 p.m. The instructor led the live class (using HorizonWimba®) and all of the students studied the same theory in each week. They worked in their online groups for 20 to 30 minutes in HorizonWimba® where they discussed the applications of the theory and provided three suggestions related to the challenges for the theory. After the group discussion, the students came back to the main online classroom, where one of the group members presented the group's ideas.

In Phase Two, the students did not meet in a live classroom. Instead, each group studied different learning theories based on their educational interests. Each group was required to come up with a lesson plan idea that used the theory about which they read. They were required to write and revise the lesson plan until the whole group was satisfied with the lesson. The lesson plan was then posted in the public area of that particular theory in the discussion board in WebCT®.

The Groups

The two groups for this study were chosen based on case selection criteria as described in Chapter 3. Table 4.1 below summarizes the background information of the six participants in the groups. The participants were four females and two males. In terms of ethnicity, five were Caucasian, and one was African American. The number of previous distance courses the participants had taken varied from two to nine.

Table 4.1. Participants

Name	Group	Gender	Age	Race	Major	Status	Subject matter	Overall computer expertise.	Expertise in using online communication tools	# of online course
Audrey	1	F	26-35	Caucasian	-IDD IT	-Full time student	Intermediate	Expert	Expert	7
Gregory	1	M	26-35	Caucasian	-Music Education (2 nd semester ph. D.) -Teacher in K-12	-Part time student -Full time teacher	Intermediate	Intermediate	Intermediate	4
Jennifer	1	F	26-35	Caucasian	-IDD IT -4 th grade Math teacher	-Part time student -Full time teacher	Novice	Novice/ Intermediate	Novice/ Intermediate	2
Brad	2	M	36-45	Caucasian	-Specialist Instructional Technology -Math teacher	-Full time student -Full time teacher	Intermediate	Intermediate	Intermediate	2
Julia	2	F	36-45	Caucasian	-School Library Media Program	-Full time student	Intermediate	Intermediate	Intermediate	9
Marie	2	F	36-45	African-American	-IDD IT -Special education teacher	-Part time student -Full time worker	Intermediate	Intermediate	Intermediate	4

Group One

The three members in Group One were Audrey, Jennifer, and Gregory. Group One was interested in K-12 with a language arts/school library focus. Gregory and Audrey were familiar with each other from another course they had taken together (i.e. a technology enhanced learning environments course). Audrey and Jennifer knew each other because they were in the same group when they took an instructional design course in the summer of 2006.

Audrey. Audrey was a Master's student in her third semester program in instructional technology. She lived in a city one hour west of the university. Prior to becoming a full-time student, she was employed as a kindergarten teacher. She had taken seven online courses before this study and had experienced online groupwork both in the workplace and in school. She rated her perceived level of subject matter expertise as Intermediate, her perceived level of overall computer expertise as Expert, and her perceived level of expertise with online communication tools as Expert.

Audrey had a personal connection with two group members coming into the course. During one interview, Audrey commented on her communication and interaction in her group, "It's been really easy to communicate because I do have that personal connection; I have a past experience with them. It helped me because I already knew both of them from previous classes. I'd been partners with them before and so I definitely already felt a sense of connection going into it."

Regarding her role in previous groupwork experiences, she indicated she was typically a team leader, but in this project she did not play the role of leader. She stated, "My role was kind of different from past experiences because normally I tend to be like team leader or I tend to kind

of mediate things. But this time, because I knew both of my group members before, we really didn't have a group leader.”

Gregory. Gregory is a doctoral student in the second semester of the music education program. He lived in a city three hours northwest of the university. He was a K-12 music teacher. He was taking the class as an elective. He had taken four online classes prior to this study and had also experienced online groupwork with Audrey. He rated his perceived level of subject matter expertise as Intermediate, his perceived level of overall computer expertise as Intermediate, and his perceived level of expertise with online communication tools as Intermediate.

Gregory's previous online groupwork experience with Audrey was helpful for working in this group because they understood each other's strengths:

I had worked with Audrey before and she worked with Jennifer before, and so we all knew coming into it that we were dependable and we could work together.[when] you have that previous experience where you've worked with the person before, I think that helps a lot.

Jennifer. Jennifer was a Master's student in her second semester of the instructional technology program. She had taught both the fourth and fifth grade for several years; at the time of this study she was a fourth grade teacher of math and science in a city three hours south of the school. She had completed two online classes prior to this class. She had experienced online groupwork in a school. She rated her perceived level of subject matter expertise as Novice, her perceived level of overall computer expertise as Novice/Intermediate, and her perceived level of expertise with online communication tool as Novice/Intermediate.

During a face-to-face interview, Jennifer described herself as a self-regulated learner. She mentioned that “a learner's self-discipline and motivation are important to take an online class.”

She did her best personally, and then she discussed her work within a group context. “I have a lot of time to think about it by myself and then go back in and reflect with the group and then put it together as a group. And we can put our own input in and then kind of come in together as a group and collaborate more together.”

Jennifer stated that online classes are the best way for a busy person to earn a degree. She enjoyed the flexibility and convenience of an online class because, as an in-service teacher, she needed to balance her job and her coursework.

I like that we won't be meeting in the classroom because now that I know we want stuff done, it's really nice because being that I'm working right now and in meetings and things like that, it's nice because I can do my class when I have time to do it, not at a certain day and certain time because sometimes I just had changed my schedule for work and school and so it's been balancing my job with my class. And I really want to do it so I like the flexibility.

When asked about her first online groupwork experience, she said that she had a hard time finding a group when she took an instructional design course because as a distance learner, she did not have flexibility to find a group:

The biggest thing that bothered me was that I had to come up with my own group and say that you are taking your first online class. You may not know anybody in that class and it's just hard. And being a distance, learner, it is just hard. And I don't have the flexibility of living in Athens.

Group Formation. Most groups in the class were formed in the first face-to-face meeting of the class. However, Group One formed before the class started. Only Audrey was able to attend the first face-to-face meeting. Gregory could not attend the first class meeting in school, so he tried to form a group before the first face-to-face meeting. Since Gregory knew Audrey and was aware that she was also in the class, he contacted her and asked her to be in his group. He also posted on the class discussion board in WebCT® that they were looking for group members. Jennifer responded and said she was not able to attend that first meeting either. She was also

looking for a group. As Jennifer and Audrey already knew each other, it worked out well for them to be in a group with Gregory.

Group Interaction. Group One had two different group interaction patterns, one when the class communication mode was in a synchronous mode via the virtual class room on the HorizonWimba® and another when the class communication mode shifted to an asynchronous mode via the bulletin board on the WebCT®. During the monthly interviews, Group One described their communication patterns when I asked, “Can you tell me about how your group communicated?” In January and February, the group mainly used email during the week, including email on WebCT® and personal email. The group met several times each week, including a synchronous meeting on Tuesdays for class, in the break-out room, and then met again in the break-out room after class to discuss a few things and see what they needed to be working on in the coming week. The break-out room was where most of the group decisions and collaboration took place. While Audrey and Jennifer also called each other if they needed to get something figured out together, there were no calls between Gregory and the two female group members.

In March and April, as soon as the class moved into an asynchronous mode, Group One no longer met in the HorizonWimba® Classroom, but began communicating strictly by email and discussion board once or twice a week. They posted their lesson plans on the discussion board, but the weekly assignments were completed by email. When they were getting their project ready to submit they emailed one another more frequently.

Group Two

There were three group members in Group Two: Brad, Julia, and Marie. Group Two was interested in K-12 without a language arts focus. Marie and Brad had taken two courses together

in 2006 and were taking two courses together in the spring of 2007. Julia was in a different program, so she did not know the other two students in her group at the beginning of the semester.

Brad. Brad was a Master's student in his third semester of the instructional technology program. He was a full time student and a full time worker. Brad was a math teacher in a high school. He had completed two online classes before the study and was taking two courses in the spring semester: EDIT 6100 and EDIT 6400.

As Brad had taken classes before with Marie, he was familiar with her working style and personality. He had also experienced groupwork online, as well as groupwork in face-to-face settings. In one interview, Brad indicated that his previous online class experiences helped him "to know what to expect as far as content delivery and the other functions of WebCT®." He rated his perceived level of subject matter expertise as Intermediate, perceived level of overall computer expertise as Intermediate, and perceived level of expertise with online communication tool Intermediate.

Regarding group collaboration, Brad addressed the issue of equal participation. He stated that group work collaboration will be effective if everybody does their share of work in their group:

But if it is done right I think the group work collaboration can be effective as long as you know, everybody does an equal amount of work. I think the down side would be if one person ends up doing more work and some of the other people in the group don't do as much and I don't know how you would regulate that. But I mean, I think it's going to be fine in our group, we have three people and they all seem to be willing to do what is required.

Brad liked to participate in groupwork and learned through group work. He mentioned that the type of group task is important and should be authentic in a group:

I like the group work. I think you learn from it and you're able to produce a bigger project when you can break it down to responsibilities. The other thing I like about group work is that I think it more what you find in a working world, you know, most people don't work in a vacuum, where it is just them, most people work with other people on projects and so I think project based group work is a more realistic type of project that you would have after school, like in a non school environment, I think you are going to work in groups and have projects.

Julia. Julia was a Master's student in her second year of a school library media program. She was a full-time student at the time of data collection, but had worked as a teacher in the past. She had experienced both online groupwork and groupwork in a face-to-face setting, and she had taken nine online classes before the study took place. She did not have a history with her two group members. She rated her perceived level of subject matter expertise as Intermediate, her perceived level of overall computer expertise as Intermediate, and her perceived level of expertise with online communication tool as Intermediate.

Julia did not know the other two members of her group initially, so she wanted to know information about group members' skill and background. She stated,

Initially it was just sort of what they were going to focus on because they, Brad and Marie, know each other from previous classes and so I was sort of looking at what their focus would be. I knew they were teachers and so initially when I joined our group, it was because the class so small, it was just sort of a process of elimination or just sort of happened naturally. I just kind of tried to fit in.

Julia expressed that her experience of face-to-face groupwork helped to make it easier to work in an online group. Collaboration at work has prepared her to collaborate online:

I've had online classes. The group work, though, was done typically with a group of students who I did have face-to-face encounters, and the group work that was done through the online class typically was done through established relationships or an established group in another class. So I had an opportunity to email them or mention them in face-to-face meetings while attending another class. So that made it a little bit easier for conducting the online group work experience.

As a full time student, Julia expressed differences between a full time students and a full time worker. She wanted to discuss things and set some sort of deadlines for rough drafts, but her group members had a different schedule because they were full time workers. They prioritized their jobs more than their coursework. Julia realized that her situation was different from theirs: “I think so [I need more communication]. I think I work differently than the other two people. And also, because I am not carrying a full time job, I think I focus on things probably a longer time span than most people.”

However, Julia mentioned that she had done lot of groupwork at the graduate level, so she was a bit exhausted with groupwork because groupwork required multi-leveled social interaction.

In many ways it has advantages but I can see that, for me, it’s a very multileveled social interaction for me because it is very social and it involves communication skills and academic skills and it involves personal skills and I think it’s a lot for me to juggle. And every class I have has it. So, in many ways, I’ve just found ways to help me deal with it. So, at this point, setting my own guidelines may be letting someone initiate something. Sometimes throwing out an email to other group members has helped.

Marie. Marie was a Master’s student in her third semester in instructional technology. She was a full time math-science teacher in a middle school. She took two online classes including instructional design in which she and Brad had both participated in the same online groupwork before the time of this study. They were also taking Introduction to Instructional Technology together. She rated her perceived level of subject matter expertise as Intermediate, perceived level of overall computer expertise as Intermediate, and perceived level of expertise with online communication tools as Intermediate. In a face-to-face meeting, Marie expressed that her experience with groupwork in instructional design was helpful for online groupwork. At that time, she was struggling with her group project.

Regarding an online class, Marie felt more comfortable talking to people online when she did not see other see the people: “Online, being online is a good thing because you don’t have to see the people, so you feel more confident about talking and not necessarily feeling like you’re saying the wrong thing. You don’t see their faces or expressions, so you feel more comfortable.”

Regarding her personality, Marie did not talk much in the class at the beginning of semester. She explained, “I’m a shy person, so I don’t like talking a lot. I don’t mind it in the group but like in class, I don’t like talking a lot and so they probably didn’t feel like I had a lot to contribute until we got to the group and I told them I could do certain things.”

As a full-time teacher, Marie expressed how difficult it was to take an online class. Her online classes took place at the end of her work day when she was tired and could not focus on her studies:

Because we’re taking classes after most of us have been to work, sometimes we’re tired and we don’t feel like talking , and so we all sit there and listen to each other, not say anything. And then finally somebody – usually Brad, because he’s so good at talking and getting us to talk – and he’ll ask us questions and we’ll start talking about whatever the question is. So mostly it’s just that we’re tired and just, it’s hard

Marie also expressed a balance issue between her responsibilities as a student and as a mother. She perceived missing group meetings as challenges. She mentioned that she sometimes sacrificed her class work for her family because her family had higher priority than her class work.

She [a woman] has to do all of it and so it is harder I think as a woman especially when you have a family. It was hard when I had to go away, I didn’t have any way of talking to them because I didn’t have Internet where I went and that was part of that balance that I had to make and it was a sacrifice for the class.

Group Formation. Brad and Marie were full-time teachers, Julia had formerly taught, but was not working at the time of this study. More specially, Julia was a second semester student in

a school library media program. She was only interested in the K-12 language area while Marie and Brad, who already knew each other and had worked together in a previous class, were interested in the K-12 non-language area. Despite their differences, after talking at the first face-to-face meeting, they formed a group. Brad played the role of group coordinator.

Group Interaction. Unlike Group One, Group Two's interaction modes were more stable throughout the term. In January and February, the group mainly used email during the week, both email on WebCT and personal email. The group met several times each week using the virtual classroom in HorizonWimba®. This included a synchronous meeting on Tuesdays for class, in the break-out room to discuss a few things and see what they needed to be working on in the coming week.

In March and April, though the course communication mode had changed from synchronous to asynchronous, they continued to meet at 5:00 on Tuesday in the HorizonWimba® classroom, and they also communicated through WebCT® emails.

Case Summary

The following section presents the themes resulting from analysis of the data from each group. This is followed by a cross case analysis across the data from the two groups. The research questions have been used to organize the presentation of the data

Research Question One

The first research question I had for this study was: What factors of online groupwork do students recognize as helpful in the learning process over time? Face-to-face individual interviews and online group interviews were conducted to answer this question.

Case Summary of Group One

Results of the study indicate that the participants in Group One identified the following factors as being helpful in online groupwork: previous experience, group work habits, small group size, shared interest, shared profession, convenience and flexibility of the technology, sense of connection, trust, equal responsibility, and feedback from group members.

Previous experience. The three group members perceived previous experiences as helpful for online groupwork. Gregory had challenges with HorizonWimba® in the previous semester, so he accessed the system early during the spring semester to make sure he was online and prepared before the class started. His previous negative online groupwork experience was helpful to his online work in this group. During an interview, Gregory stated,

I know last semester one time I had a hard time connecting to HorizonWimba®. I tried to eliminate any possibility of that again. Last semester I ended up missing an entire class because I couldn't get the connection. So, I try to get on there early to make sure I'm on there before the class starts.

Jennifer also discussed a negative experience with an online class and how that impacted her experiences in this class:

The biggest thing that bothered me was that I had to come up with my own group and say that you are taking your first online class. You may not know anybody in that class and it's just hard. ...I know in the beginning ...I was just so glad that Gregory emailed and said "I would like to make a group" and I knew Audrey in the class, too, and it just worked out and I feel really fortunate but I don't know if I'll always have that experience. I might have to stress over making my group again"

Group work habits. Group members in Group One perceived work habits as helpful. They decided their groupwork schedule early, divided their work among group members quickly, and followed the schedule. The process helped them to complete their project on time. In a group interview, they agreed that their work habits affected group dynamics. Gregory stated, "We decided early on how we were going to divide up the work for the class. There was a lot of

flexibility with how we wanted to do it and which role each person wanted to play. And so we decided pretty early on how we would do it and we'd stick to the schedule and did that throughout the whole semester and I think it went smoothly." Like Gregory, Jennifer stated that their group made a decision early about groupwork division and a schedule: "Before we went into the mode of working independently and not meeting in class, we had already made a decision about the group project. We knew we were going to do a narrated PowerPoint. We made that decision before we were working by ourselves."

Small group size. The three group members in Group One also perceived having a small group as helpful. The participants indicated that a small group size helped them to have equal responsibility and get to know each other easily. Gregory stated that "when you don't meet face-to-face and it's harder to get to know each other. It's easier with a small group. I think if the groups were bigger, it'd be a lot harder to get to know the people in the group." Audrey mentioned that her group size was perfect for her groupwork:

I think the group size for me was perfect because there were only three of us and so everyone had to pull their own weight because we rotated all the tasks out and so you couldn't hide behind somebody else and not do the work. So, I definitely think limiting the group size. That was great.

Shared interest. Regarding an educational interest area, the group members in Group One had the same interests in K-12, so they felt more comfortable and working together. Audrey mentioned that finding a group that "speaks the same language" was one of the important factors for forming a group:

Remember the first day of class was face to face in [the university] and we had to come and we mingled with people to see what our interests were, if we had a K-12 setting or if we were business...that way we could kind of figure out our group. I have found that it is a lot easier because our group is all K-12 setting so we don't have to struggle with bringing in the business side of it. So, we're all in an area that we're familiar with and are comfortable with and plus it's where we want to stay. So, we want to focus in our

specialty area. We all understand the lingo, some of the jargon whereas in the business portion of it...if it doesn't make sense to me and so I first have figure out what they are talking about and then I have to figure out how to apply it in the business setting and that's difficult if that is not what your interest is.

They were all teachers, so it was easy for them to build connections, as Gregory stated:

We're all teachers helped us. We had that common bond and again, having never met, it was good to know that we at least had that in common because we don't know much about each other otherwise, I guess. I know that Audrey has a son and that's about all I know about her. So, knowing that we were all teachers working in the education field provided a stronger connection.

Shared profession. Group One perceived having commonalty as teachers as being helpful. During the interviews, their shared teaching background helped them to feel more comfortable with each other and to build a sense of connection. Jennifer expressed, "We're all in an area [K-12] that we're familiar with and are comfortable with and plus it's where we want to stay."

During the interviews, they indicated that they could also get realistic feedback from different teachers' perspectives. Gregory stated,

The best thing about it is that each person brings a little bit different perspective, we are all teaching in different areas and so we approach a problem sometimes in different ways and it is good to get another teacher's perspective on problems that everybody faces and so that's probably the biggest advantage.

Convenience and flexibility of the technology. Analysis of the interview data indicated that convenience and flexibility of the technology were viewed by the students as the main strengths of online learning. Gregory reported that "As in-service teachers, it would not be possible to take the class if it was not offered online, so that was a definite benefit." Jennifer also mentioned,

It's really nice because being that I'm working right now and in meetings and things like that, it's nice because I can do my class when I have time to do it, not at a certain day and

certain time because sometimes I just had changed my schedule for work and school and so it's been balancing my job with my class. And I really want to do it so I like the flexibility.

Sense of connection. Three group members in Group One initially perceived a sense of connection among group members as beneficial. During the interviews and observations, they reported that the fact that they were all teachers and had worked together in previous classes helped them to get to know each other easily and to build a sense of connection at the beginning of the semester. Audrey described the benefit of her connection with her group members, "It helped me because I already knew both of them from previous classes. I'd been partners with them before and so I definitely already felt a sense of connection going into it."

Jennifer expressed her sense of connection with Audrey:

I worked with her in the course before, we talked on the phone and I know she's got a little boy and I know she ran a ten mile run and we talked about that, we're both into running. And I feel like I know April even though I don't ever see her.

Trust. All the group members in Group One perceived trust among group members as beneficial. During the group interview, they agreed that trust made them feel satisfied with their experience in doing their group work. Knowing members before this class helped a lot because they felt comfortable with each other and they knew what to expect from the other group members. Audrey expressed that "it's been a really good experience because I know them and they know me and we know what each person is capable of doing." Another group member, Jennifer, also mentioned that "I don't really worry about my group. I know that I've worked with Audrey before and Audrey has worked with Gregory before and I feel confident that together we will get the project done and we'll do a good job and we'll all learn something. So, I feel good about my group." Gregory expressed similar sentiments: "We didn't have to worry about things

getting done or the group members doing what they were supposed to do. We could tell from the beginning that everybody was responsible and everybody would do their work.”

Equal responsibility. All three group members also perceived having equal responsibility as helpful. Unlike Group Two, Group One did not have an identified group coordinator. Audrey stated that she can count on all her group members to pull their weight,

For team work, I think we are all doing well because we know what we have to do and we'll say, 'Okay, I'm going to take part A, Gregory will take B, Jennifer will C' and we're all confident that each person is going to do their part. So, that's been nice. Because there are only three of us, there aren't a lot of people to have to manage and so everyone has to pull their weight.

Like Audrey, Jennifer also mentioned that “I felt like I could count on them. I knew that we all pulled our own weight and everything got done accordingly as we had planned for the most part. Gregory also expressed: “We all kind of shared our role equally. For the group project, we each did a PowerPoint and we decided which part of the chapter we wanted to do and then each one of us did the PowerPoint for that portion of the chapter.”

Feedback from group members. All group members perceived receiving group members' specific and just-in time feedback as helpful because their group members provided input that maybe they had not considered. Gregory addressed the importance of group member's prompt feedback. He stated,

I really liked being able to do the lesson plans that way because you were able to get some feedback and then have some things to change that I might have missed before I submitted it to [the professor] for the first time and so that's helpful to have somebody else look at it before it is submitted.

Like Gregory, Audrey mentioned the importance of group member's specific feedback. She indicated she was unsatisfied with one group member's short and low-quality feedback in March, but in April, she got specific feedback from her group members and mentioned, “The

good part was when they would provide feedback. It would be very specific so I would know exactly what I needed to change or work on. So, that was the best part.”

Jennifer also expressed the help of feedback from her group members. She stated, “I got feedback from them. It was very helpful, too, I definitely used their feedback. There were some things that I had overlooked.....that was helpful that they looked over.”

Case Summary of Group Two

The results of the study indicate that the participants in Group Two identified the following factors as being helpful in online groupwork: previous experience, personal work habits, small group size, shared interest, shared profession, convenience and flexibility of the technology, sense of connection, feedback from group members, peer support, emotional support, leadership, and prompt feedback from the instructor.

Previous experience. The three group members perceived a previous online class and groupwork experience as helpful. Previous online class experience helped them do online groupwork. Marie stated,

I’ve had online classes before, 2006 last semester, and last summer, and I found that it was really difficult, especially when people weren’t used to using the technology. Sometimes it’s kinda frustrating, when you’re trying to listen for someone’s comments and then someone else pushing the Control button or something like that. It makes it so that you’re distracted to what the person’s saying, because you’re looking more at the monitor and not really listening to what’s going on.

Julia also expressed that her experience of groupwork helped to make it easier for her to work in an online group, stating that collaboration at work prepared her for collaboration online.

I had C 7000 and C 6120 and it was online. And there was group work with that. And then I took a C 7150 and so if I’m looking back at my experience I have to say probably my face to face experiences have helped with my online courses.

Brad agreed that previous experience was helpful. He stated that “It [previous experience] helped me by having an online course previously to know what to expect as far as content delivery and the other functions of WebCT.”

Like Brad, Julia also mentioned that previous experiences with technology were helpful and affected group dynamics. When asked “What factors do you think affect group dynamics?”, She stated, “Since we’re so reliant on technology for our group work, probably your comfort level with certain technologies.”

Personal work habits. Group members in Group Two perceived work habits as helpful. During the group interview, Group Two agreed that work habits were important and impacted group dynamics. Maria stated, “As far as group dynamics, I believe personalities affect it. I think probably your work habits, making sure that you come to group on time and things like that. Maybe just the ability to communicate with the group.” Julia reported that though her group did not have a detailed time line for draft group project, she set her own deadline: “We have set no deadlines for rough draft and so what I’m doing is I’m setting my own personal deadlines because I think for me, personally, it helps to have a time frame.”

Small group size. The three group members in Group Two also perceived having a small group as helpful. Marie perceived having a small group size made communication and collaboration easier. She mentioned that “small groups are better than larger groups. I think when you have a large group it’s hard to divvy up the amount of work so that it is even.”

We only have three groups in our big class...and one group was huge, it was like five or six people in it and I think he [the professor] suggested in the beginning of the semester to try and make that group smaller so that it would work better together.

In a group interview, the three group members agreed that group size impacted workload in the group interview. Brad stated, “If the group size is too big, it becomes difficult to share the workload equitably.” But Julia stated, “group size depends on the nature of the project.”

Shared interest. The three group members in Group Two also perceived having shared interest in K-12 as helpful, which help them to get to know each other more easily. Marie stated that

It could have been, we were all teachers...because you do a lot of collaborating with teachers when you work in a school system and so I think that would help more than someone who maybe worked in a business, but I guess in business you do a lot of collaborating, too. So, I don't know, it was part of all of us came from an education background so that probably helped with us being able to work well together.

Like Maria, Julia also indicated the shared interest as helpful, stating, “finding people with similar interests or people that you have positive relationships with helps.”

Shared profession. Group Two perceived having a commonality as educators as being helpful. During interviews, the group members reported that their teaching background helped them to feel more comfortable with each other and to build a sense of connection. As Julia explained, “We've both taught and so we can totally relate [to each other]. ...as I mentioned last time, probably the teaching connections.”

They also reported that they could get realistic feedback from each other and benefit from different teachers' perspectives. Julia stated,

I learn through the group activities because one, the group members have different backgrounds, different levels of experience and also they're approaching it from a different perspective whereas I'm coming from school media library, they are coming from middle and high school education. And you know, they are bright people.

Like Julia, Marie also mentioned,

I think one thing that is good is that because we are all educators we are kind of coming from the same idea place where we all know...we've all taught before so it is not that we're just learning to teach and so we all have the understanding of how we kind of go about building up lesson plans and what really happens in the classroom.

Convenience and flexibility of the technology. An analysis of the interview data indicated that the opportunities for collaboration made possible by the online learning environment were viewed by the three group members in Group Two as the main strengths of online learning. As Julia explains:

We were online and we actually stayed online and did work online where we submitted something that we'd worked on, each of our parts, but we stayed online to edit it and actually were working on it in our discussion group and that worked fabulous. That, to me, has made the most sense, that process of staying there and having one person on the Internet grabbing graphics, one person putting the document together right there and we can talk and hear each other and then instantly edit something and show it right then and there. So, that, I think has been the most success.

Sense of connection. During interviews, all group members emphasized that, as their group members were all educators and had taught, their backgrounds helped them to build a sense of connection. Over the course of the semester, two group members, Brad and Julia, through online collaboration, built a growing relationship and a strong sense of connections though they did not know each other at the first of the semester. Julia stated,

I think, for Brad and I, we've probably, in the last couple of weeks, have helped each other kind of deal with situations. And, you know, I think we tend to do the same thing when, we just sort of hash out the work and take turn: "OK, I'll deal with this. You deal with that. Fine." And we do it. So that's worked really well. And he's funny anyway. He makes me laugh. I like him.

Like Julia, Brad expressed strong sense of connection with Julia:

One of my group members has kind of a quirky sense of humor and I understand that and so we were always sending each other emails and we'd put like little initials on it and we always sort of understood what it meant. We just had a nice conversation and "it was nice

working with you” and she’s moving to Charleston and so I wished her luck and so I really enjoyed that.

Feedback from group members. All group members in Group Two perceived getting feedback from group members as helpful. In the group interview, they agreed that feedback impacted their satisfaction with group work. Julia got valuable feedback from her group members and stated, “I think probably when I got stuck in how to organize part of my writing, they helped so that there was two sets of eyes other than mine to look at my work.” She went in to state that her group “worked things out . . . it seems like some of our strengths and some of our weaknesses are helping each other so I think the group has jelled by now [in March].”

Brad reported that he learned through experiencing multiple perspectives, through peer evaluation, and through receiving some corrections and criticism from his group members.

We read each other’s papers and what we’ve been writing and make suggestions. It’s been good and I think the criticisms have been constructive and well taken. We know that we’re in the same boat as students and just trying to make the best product that we can.

Peer support. The group members in Group Two had different skills, so group members’ strengths helped balance other group member’s weaknesses in providing support for the group. In Group Two, Brad had communication and editing skills, Julia had writing skills, and Marie had story telling skills, so they each took a part in which each member could use their strength. Marie stated, “I think to use your strengths that you have, for example, I ended doing the story type things, whereas Julia was more into the research and Brad liked the editing part. So, it made us work well together because instead of being weak, we used our strengths and we each built up our weaknesses through helping each other.”

Brad also stated that his group members had different skills, such as good writing skills, which helped him organize his work a little bit. He stated, “One of my members, I really liked

working with her because I think she was able to look at the work that I'd done and sort of redirect me. She was a good editor for me because we'd put all those parts together and she said, "You have some good stuff here but we need to kind of tighten it up."

Marie also got help from her group members when the instructor asked them to add another part to their group project. She took responsibility for adding another part to the e-book improvement. Initially, however, Marie did not do this well because she had limited previous experience of doing research. Her group member, Julia, showed her how to do it, so her part worked out really well in the end:

I had to do another area of that which was a learning experience also because I'd never pulled information for research before and tried to incorporate in a paragraph form like that. And so the first time I did it, it didn't work well and the second time Laura helped and it worked really well. And so she is a librarian and so she knew exactly how to set it up and she told me very simply how to do it, how to cite references and it worked out really well.

Emotional support from group members. The three group members in Group Two reported that they perceived emotional support as helpful in the group interview. They agreed that emotional support from group members impacted their satisfaction with online groupwork experience. Marie stated,

I think emotional support is really huge, because it just keeps motivating you to work to work more and more with the group that you're with. I think the three of us have had a great experience together in this class as far as working together as a group because we all kinda had the same ideas of trying to be flexible with each other, but then realizing that we all have other jobs that we do. We're all working and doing other things and so, you know, we try to make each other feel good about our contributions. I think that means a lot.

Like Marie, Julia stated that emotional support was helpful:

I think just sometimes just like emotional support of being those one-liners, like, "We'll get this done" or "We'll work it out," that seems to help because I probably stress out on group work a bit I think because I'm in a different situation and I'm just a different being,

but, you know, I think knowing that someone is there that will send the email, that will say something positive, that, “We’ll sort it out,” and is willing to, for people who are willing to work on tough things. So that’s been real positive.

Leadership. Two group members perceived the group coordinator’s leadership as helpful in online group work. Marie and Julia indicated that their group leader was a good moderator and motivator. Marie mentioned that her group leader, Brad, was a good moderator. She stated,

As far as what we had to deal with the timeline. We had somebody stuff came up, we couldn't meet, and Brad was really good at letting us know when we would meet again, and then if we couldn't meet, he would email us the information and things like that. So I think that was pretty much it.

Marie also stated that he was a motivator, “Brad, see how Brad is our cheer leader. He just makes us all, we just have fun together and be able to look at all the benefits that we have.”

Julia pointed out the importance of the project manager’s leadership: “It’s good to have a leader who is going to kind of monitor the group.”

Prompt feedback from the instructor. Giving prompt feedback is an important role for the instructor. Most of the students perceived the instructor’s just-in-time feedback as a helpful.

Brad addressed the importance of instructor’s prompt feedback. He stated, “[The professor] has made himself available, ‘If you need me, send me an email’ and he’ll be there. You always get a response really quickly from [the professor].” Julia also expressed her good experience about this:

When we gave him our first draft, he responded by giving us a lot of feedback, which is really helpful because then we were able to see what he was looking for and how to better adjust what we had done to what he really wanted.

In the group interview, Group Two agreed that the instructor’s feedback made them feel more satisfied with the groupwork. As Brad stated:

Like if we're doing a small project together and we get feedback from the professor saying that we got all our points, I mean, it just makes me feel that because we contributed and we all worked together we've done a good job, it just makes you feel like you've accomplished something.

Results of Cross-Case Analysis

The results of the cross case analysis indicated that the participants in the two groups identified the following factors as being helpful in online groupwork: previous experience, work habits, small group size, shared interest, shared profession, convenience and flexibility of the technology, sense of connection, and feedback from group members. Table 4.2 summarizes the similarities and differences between the two groups regarding the identified helpful factors.

Table 4.2. Similarities and Differences between Two Groups Regarding Helpful Factors

	Group One	Group Two
Similarities Across Groups	<ul style="list-style-type: none"> • Previous experiences (online, groupwork, online groupwork, technology) • Work habits (groupwork habits in Group One, personal work habits in Group Two) • Small group size • Shared interest • Shared profession • Convenience and flexibility of the technology • Sense of connection • Feedback from group members 	
Differences between groups	<ul style="list-style-type: none"> • Trust • Equal responsibility 	<ul style="list-style-type: none"> • Peer support • Emotional support • Leadership • Prompt feedback from the instructor

Research Question Two

The second research question I asked was: What factors of online groupwork do students recognize as challenging in the learning process over time? Face-to-face individual interviews, online group interviews, and observations were conducted to answer this question. While the

students in these two groups worked relatively well as a group, they did face challenges over the course of the semester. Both groups attempted to overcome these challenges, each with varying degrees of success.

Case Summary of Group One

The analysis of the interview transcripts indicated technology, task, communication, accountability, lack of sense of connection, and the instructor's feedback as challenges for groupwork.

Technology. All three group members in Group One perceived the technology as being a challenge in online groupwork. Tools such as HorizonWimba®, WebCT®, and email were the primary tools for their group work according to the interviews and observation. All three members mentioned in interviews that they had a problem with HorizonWimba® application loading. Audrey commented the HorizonWimba application did not facilitate group collaboration fully. For example, while one person talked, the other members had to wait their turn because HorizonWimba® supports only one person's talking at a time. While this is also generally true in a face-to-face setting, this is a different kind of interaction than that which occurs in a face-to-face setting because you cannot "see" that the others are fully engaged in the conversation or pick up cues that they want to talk.

Though Gregory was familiar with using HorizonWimba in his previous class, he also perceived technology as challenge. He said that "the technology did not work properly with each other, not being able to hear each other from time to time, so that's still an issue although they knew how to handle those things." Due to these issues, one time he was not able to participate in his group meetings. Jennifer also perceived difficulty with technology as a challenge. Her computer did not function, so she was late for the class once, which hindered group collaboration

and equal participation. She also worried about her instructor's perception of her. She suggested that students should be prepared to use the computer and make sure their computer works.

Audrey mentioned that a technology orientation in the first online class was helpful and addressed the importance of technology orientation.

Task. Group members in Group One perceived the type of task for the group project as being a challenge. During interviews, they reported that their group project was changed by the instructor's request. As a result of this change, the group members considered that their group project was no longer a collaborative process but individual work, like an independent study, as the work did not require much interaction. When this happened, Jennifer indicated that she lost motivation about her group project:

I thought it was surprising that we didn't have to do it as a group. I guess the challenge for me was not knowing that right off the bat because I was trying to put the thing together as one. And part of me is not happy about it because I spent all my time trying to make cohesive be it together and I don't think everybody in my group was thinking in that perspective. May be submitted separately. My portion on it. I think that's the biggest thing this month that I've faced."

Audrey also reported that the group project was individual rather than collaborative: "We divided up the work and just did our own thing and submitted it separately. So, as of the month of March, we have had zero collaboration." Her group task may have impacted group collaboration because the task was such that it could be individually completed by each group member and then put it together at the end. However, Gregory also mentioned though there was little collaboration in doing groupwork, "it made it very manageable and an appropriate amount of work for an in-service to do during the semester."

Accountability. Two group members in Group One mentioned that it was challenging when one group member did not provide feedback on their weekly groupwork and did not post

her lesson plan on the WebCT® bulletin board on time. Writing a lesson plan was individual work, but required peer review, so one group member's delay impacted the other two group members. Gregory complained, "The lesson plans, the peer review is supposed to be done by tomorrow but that isn't going to happen with one group member because she still hasn't posted her lesson plan."

Audrey was also frustrated by another group member's lack of response to her email: "It was difficult because I had no idea if someone had received my email or if they were just ignoring it, you know? And there were a few times I had to submit group work when I hadn't received any feedback at all from other group members."

Communication. When the communication mode changed from a synchronous to asynchronous, two members of Group One expressed concern about the difficulty of communication. Gregory felt that things were a little more difficult when they "don't have a regular weekly meeting that you're all going to be online at the same time." Audrey perceived the difficulty of communication with her group members as a big challenge due to "not meeting face to face or meeting live online to have a verbal communication because [she] was completely at the mercy of the other group members on whether or not they chose to respond to [her] questions or concerns." She describes this challenge in more detail below:

The challenges have been that I send out an email and not everyone responds to the email and so we don't know what everyone is thinking. There are several things after the group project and our weekly assignments that we email each other for feedback and not everyone is replying to provide feedback. So, that's been a big challenge is that we're not getting a response from everyone in the group and so that's been very difficult.

Like Audrey, Gregory also commented on the difficulty of communication:

I guess mostly has been with the lesson plan that we're doing and providing peer feedback. One of my group members didn't post her lesson plan for us to review and I reminded her about it and she said, "Oh, yeah, I forgot" but still hasn't posted it so...I've

been worrying about trying to get that reviewed for her in time for her to make the revisions before she has to turn it in. So, that's been a little bit frustrating.

Lack of sense of connection. One challenge reported by one group member was the lack of a sense of connection in Phase Two (asynchronous online classes). The course structure changed from synchronous to asynchronous. Furthermore, their group project, which was changed at the instructor's request, did not require much group interaction. Therefore, Group One did not have any online group meeting in HorizonWimba®. The lack of verbal communication and not knowing if her group members had received her emails were challenges reported by Audrey. She only received one response from a particular group member. Audrey expressed that she felt she lost connection with her group members in March, stating: "I don't even feel that I'm part of the team at this point." She explained that the lack of communication happened when the class changed from a synchronous to asynchronous communication mode:

As of March we have lost all connection. I don't even feel that I'm part of the team at this point. I feel like I'm doing the class solely because I will email a question to team members and get no acknowledgement of the email ever being sent and so it's very difficult. One member is doing very well and responding to emails and giving feedback and ask for assistance but the other one is not. At this point I don't feel like I have very much of a connection at all to my group members. Even when I do get feedback, it's very short and very limited and you just don't have a sense of connection at all anymore.

Feedback from the instructor. Two of Group One's members perceived the instructor's last-minute feedback as being a challenge. Jennifer described getting the instructor's feedback shortly before the final project was due. She stated that "it would be the last tidbit of feedback from [the professor] saying we needed a script because I wasn't anticipating that." So, she had to hurry up and turn that in although she wasn't previously aware that he wanted that. She mentioned "He kind of pulled that last minute after he had already reviewed it once and said it was okay. So, I was pretty surprised by that."

Another challenge was getting unclear feedback from the instructor. When this happened, Gregory had difficulty understanding what the instructor meant:

There were a couple of times when—and I can't remember specific incidents—but he'd comment on something we'd submitted or say something on something we needed to improve on and sometimes it wasn't as clear as what he was looking for and when you're not meeting with someone face to face sometimes things don't seem as clear.

Case Summary of Group Two

The analysis of the interview transcripts indicated technology, task, communication, accountability, peer evaluation, different writing and research skills, time management, and feedback from the instructor as challenges.

Technology. All three group members in Group Two perceived difficulty in using the technology as being a challenge in online groupwork. Tools such as HorizonWimba®, WebCT®, and email were the primary tools for their groupwork. In the group interview, all the group members in Group Two agreed that technology is an important factor that affects group dynamics and group interaction. Therefore, unfamiliarity with the technology impacted group interaction negatively.

During one interview, Brad expressed his negative experience with WebCT email. He was unfamiliar with setting up an email account, so he did not check an email for one week, which impacted the group interaction and decision process. He stated,

Because in the WebCT we have email and that's kind of the way they want everybody to communicate in the class. So, I wish there was some way I could forward that to my school email because that's the one I monitor like twenty-four hours a day. So, I think I would have a better connection if I was able to forward that email from WebCT directly to my Gwinnett account because now, it's just like Julia tried to contact me last week and she sent me an email via the WebCT and I had done my school work Saturday morning and she'd sent it like Sunday and so I missed it. I didn't have it until I got back to class on Tuesday and then she said, "Did you get my email?" and I was like, "No" because I really only check it once a week, the day I do class work. So, I think I'd have a better connection and interaction if I was able to email with my Gwinnett county account.

All three members mentioned that they had a problem with how to use the Whiteboard in the HorizonWimba® application. Brad and Julia were frustrated with the Whiteboard when they had a group meeting, as they explain below:

We did a small project and were trying to present it to the group as a whole, to the class as a whole, and unfortunately we didn't know we hadn't saved the slide, and so when we got ready to present, the slide was gone. It was frustrating, when you've put time and effort into presenting and showing the best work that you've done. [Julia]

We've been kind of frustrated with typing in the slides and then if we wanted to erase one word, both Julia and I have done this, we've pressed the 'erase' and it's erased everything. So, I would think that needs to be improved a little bit. Students need to be familiar with WebCT and Horizon Wimba. [Brad]

Julia mentioned that one group member was without a microphone for two weeks when they were preparing for their final project. Until that happened, she had been chatting with him in HorizonWimba, but after that they did not “stay online very long for the last two weeks of April.” Marie also talked about Brad's technical problem as one of biggest challenge.

Task. The group members in Group Two perceived the type and scope of a group project as being a challenge to online groupwork. Julia stated that the task impacted group dynamics and group interaction: “The nature of the project, trying to do it virtually or online may be quite challenging. For example, our group had to write, and I think conducting a writing project is probably one of the most challenging projects.” Julia believed that her group's online project was inappropriate for online groupwork: “I don't think writing an eBook chapter is conducive to an online group at all.” She also was aware that traditional classroom approaches might not work well online:

I think that's where we are with online learning . . . people are trying to approach it still in traditional formats, and traditional formats are not necessarily conducive in online environments, where they create more challenges.

Two group members in Group Two agreed that the difficulty of their group project stemmed from the nature of the e-book improvement. Brad expressed, “I think that was hard because of the nature of the e-book. What became our biggest project was to rewrite a current chapter. [The professor] was a little unclear about the chapter.”

Their group project was impacted by many factors such as group members’ writing and research skills, the professor’s expectations, and communication. Julia stated, “I just think we’re juggling lots, and so we ought to smile with proudness that we have handled this: communication, the professor’s expectations, a huge writing project, handling the task of writing and research, just goes on and on.”

Communication. Three group members perceived difficulty in working together at the same time as a challenge. During interviews, they indicated that when a group member did not respond to emails or missed classes, it took longer to make group decisions online rather than face-to-face. Group members had different spring break schedules in March. Marie stated, “We couldn’t meet at the same time and so it ended up like two of us were maybe working together instead of all three of us. The third person who couldn’t make it would email us their part and then we’d have to put it together but we didn’t really have their input, you know, any more than what they gave us.”

Brad also expressed that it was difficult to make sure that group members checked email:

Well, the biggest challenges I think were trying to communicate with everybody at the same timeBut it was kind of a challenge just to kind of communicate. The thing about email, it’s really good but you don’t know if the person checks it everyday and you try as hard as you can but sometimes like you don’t get it one day...so again, communication is always a challenge online, and one of the biggest challenges was communication.

Accountability. Two group members mentioned that it was problematic when one group member missed a group meeting because this delayed the group decision process. Julia stated, “I

noticed when the group member was absent from class, we had to update her so that therefore it affects the decision that we had to make.” In addition, the fact that one group member missed a group meeting led to unequal participation and workload. Julia stated:

One group member, she missed two classes, and never emailed back alternate times or anything. So Brad and I have to do the work. One week I did it and the next week he did it. Brad knows how to take turns. And that also, I think, affected our final decisions on what to do with the eBook, because Brad and I made the decisions based on instructor’s feedback and the group member didn’t get to participate in those processes.

Brad also discussed this problem: “We put it off until the deadline and ended up being quite a large amount of time invested. So, we did have some challenges. There were times when we really needed to count on everybody and we needed to all be there. And there were a couple of times when one of the team members was not doing what she needed to do.”

Marie, the group member who had missed a group meeting, explained her perspective. She sometimes sacrificed her class work for her family because her family had higher priority than her class work:

She [a woman] has to do all of it and so it is harder I think as a woman especially when you have a family. It was hard when I had to go away, I didn’t have any way of talking to them because I didn’t have Internet where I went and that was part of that balance that I had to make and it was a sacrifice for the class.

Peer evaluation. Two group members in Group Two, Brad and Julia, expressed concern regarding evaluating their group members. The instructor required them to evaluate their group members on a scale of 1-100, but they were not sure what criteria to use for their evaluation.

Julia expressed a desire for more guidelines about how to evaluate her group members:

I don’t really know conceptually what he would consider areas of evaluation to be. I mean, I can guess, but it would be kinda nice that, if I’m going to deduct points, then I feel like I have to explain now why I’m deducting points, whereas if I had had, if I have some sort of rubric or some sort of checklist, he [the professor] would understand that that’s why.

Also, they did not want to be in the position of having to negatively evaluate their group.

Brad expressed some anxiety about having to negatively evaluate his group members. He

implied that this was not his job but the professor's:

I just feel like [the professor] had come to our meetings and just had just seen for the last few weeks, it's just been two members, then he's going to make his own evaluation instead of me like having to rat somebody out.

Different writing and research skills. Three group members in Group Two reported that their different levels of writing and research skills were challenges. During interviews, Julia mentioned that her group task required extensive writing and research, but her group members had different levels of writing and research skills, so she was frustrated. She explained that it was difficult for her to catch up:

I think writing is probably one of the most difficult things to have to do when it's an extensive writing and it involves research, because what I've realized is that writing skills vastly fluctuate at different levels in a group.

Marie also expressed her limited experience with research skills: "I'd never pulled information for research before and tried to incorporate in a paragraph form like that. It didn't work well." Brad complained about Marie's first attempt to do this: "It's just a bunch of stuff that you've cut and pasted that has no references, there's no citations of where it comes from. I don't know if this is your opinion or if it was somebody's research." In the end, however, with her group members' help she did finish her part.

Time management. Group Two mentioned that they perceived difficulty with managing time resulted from one group member's unequal participation:

As far as group work goes, there were much more challenges I would say in April than there were in January, February and March. And I think it was due to the fact that our work load was a lot higher. We could have been super organized and started in February with our chapter but, like most people, we put it off until the deadline and it ended up being quite a large amount of time invested. So, we did have some challenges. There

were times when the team...we really needed to count on everybody and we needed to all be there. And there were a couple of times when one of the team members, in my opinion, was kind of not doing what she needed to do. I had to actually use some pretty strong language with her and I sent her an email and I wasn't sure how it was going to go over because some people don't respond to criticism very well. They kind of sulk and mutter but I felt like I needed to say something or, you know, in the worse case, we were just going to do it with the two people that were kind of working on it an

Marie expressed that their workload and difficulty with time management resulted from individual course work and group work:

It was just a lot to do. He [the instructor] had us doing little quizzes and then we had to do a little slide...we had to do all the readings and meet to do the slide, that was another thing, we had to meet so we could do it together, it had to be collaborative. And so, it was just a lot of little things that we had to get done and it seemed like the time went by so fast. After class, I had five more days to get done all the readings and all that but it went by so fast. You knew that the work was due for the next week. Yeah, it was a challenge.

Feedback from the instructor. Two group members in Group Two reported that the instructor's feedback made matters difficult for groupwork. Marie stated that the instructor's guidelines for the group project were not detailed enough and that he did not provide enough feedback on the group project at the beginning of semester. At the end of the semester, the instructor said their project needed some major revisions; so she was very frustrated:

We would redo a whole chapter for the ebook and he didn't give us anything in the beginning to look at. What was there was okay but we really didn't like the way it was set up. And so we didn't have anything to go by. And so we did look at other chapters in the book and the one we saw that looked best, that was the ones that we kind of patterned after. And then it was sort of like...when he gave feedback, he had a certain thing in his mind what he wanted to see which is fine, because it's his ebook, but it was kind of like. . . it was good in one way because he gave us feedback so that we knew which way to go. It was kind of difficult because we felt like we were trying to best that we could without any guidance so it was like criticizing us but you're not giving us anything to go on.

Similarly, Brad expressed the ebook improvement project’s revision based on the instructor’s feedback. After turning in their draft, the instructor suggested some extensive revisions. In reflecting on this, Brad explained,

I think [the professor] has really left it open about what his expectations were so...you wouldn’t feel confined in really how to do the research and how to do your work. But then, at the same time, once you started turning in drafts, then he really started to whittle it down and I don’t know if he was more specific at the beginning if that would make a difference.

Result of Cross-Case Analysis

The cross case analysis of the interview transcripts from both groups indicated that technology, task, communication, and feedback from the instructor were challenges for groupwork. Table 4.3 summarizes the similarities and differences between the two groups regarding challenging factors. The two groups perceived different factors as being challenges in the learning process in online groupwork. Group Two experienced more challenging in their online groupwork than Group One. While Group One perceived lack of sense of connection as challenging, Group Two perceived accountability, peer evaluation, different writing and research skills, and time management as challenges.

Table 4.3. Similarities and Differences between Two Groups Regarding Challenging Factors

	Group One	Group Two
Similarities Across Groups	<ul style="list-style-type: none"> • Technology • Task • Communication • Accountability • Feedback from the instructor 	
Differences Between Groups	<ul style="list-style-type: none"> • Lack of sense of connection 	<ul style="list-style-type: none"> • Peer evaluation • Different writing and research skills • Time management

As the course structure changed from synchronous to asynchronous, students perceived different factors as challenges in the learning process in online groupwork. Table 4.4 summarizes the differences between the two communication modes regarding challenging factors. While the two groups perceived technology as challenging during the Phase One (synchronous online classes), only Group One perceived communication, accountability, and lack of sense of connection as challenges during the Phase Two (asynchronous online classes) because Group One did not have a synchronous online meeting. Although Group Two perceived similar factors as challenges, the factors may not have been affected by the course structure (communication mode) because Group Two continued to have regular group meetings on Tuesdays at 5:00 p.m.

Table 4.4. Differences between Perceptions of Challenging Factors during Synchronous/Asynchronous Class Phases

	Group One	Group Two
Phase One (Synchronous online class)	<ul style="list-style-type: none"> • Technology 	<ul style="list-style-type: none"> • Technology
Phase Two (Asynchronous online class)	<ul style="list-style-type: none"> • Communication • Accountability • Lack of sense of connection 	

Research Question Three

My third research question was: What do students suggest can be done in the online learning environment to make their groupwork and collaboration more effective? Face-to-face individual interviews and online group interviews were conducted to answer this question.

Case Summary of Group One

The group members in Group One suggested some strategies for students and instructors that could be implemented to assist students in completing groupwork online. Students suggested

various learning and teaching strategies based on their experiences in participating in online groupwork.

Strategies for Students

The data analysis of interview transcripts from Group One indicated some strategies for students. The strategies included two areas: (1) group formation (having a small group, finding a group based on shared interest, attending a face-to-face meeting, choosing people that you know and have worked with before), and (2) communication (checking email every day, sending frequent emails even if it is for something minor, having a synchronous group meeting, setting up a group communication protocol) (see Table 4.5).

Table.4.5. Strategies for Students

Areas	Group One	Group Two
Group formation	<ul style="list-style-type: none"> • Having a small group • Finding a group based on shared interest • Attending a face-to-face meeting • Choosing people that you know and have worked with before 	<ul style="list-style-type: none"> • Having a small group • Finding a group based on shared interest
Communication	<ul style="list-style-type: none"> • Checking email every day • Sending frequent emails even if you think it's something minor • Having a synchronous group meeting • Setting up a group communication protocol 	<ul style="list-style-type: none"> • Checking email everyday and the website for the class • Sending frequent emails even if you think it's something minor • Having a group coordinator
Sense of connection		<ul style="list-style-type: none"> • Attending a face-to-face meeting • Spending time together socially.

Group formation

Having a small group. Group One was small, having only three members. During the individual interviews and the group interview, all the group members reported that their small group size helped them to have equal responsibility and get to know each other easily. Gregory explained, “When you don’t meet face-to-face and it’s harder to get to know each other, it’s easier with a small group.” Audrey also mentioned that her group size was perfect for her groupwork: “Small groups work better because there is nowhere for someone to hide” Audrey suggested that “limiting the group size was great.”

Finding a group based on shared interest. The interviews indicated that group members in Group One had the same interests focusing on K-12, so they felt more comfortable and built a sense of connection easily. Gregory expressed how they were connected through shared interests. “Since we’re all teachers and we’re all in the situation of working and trying to go to school at the same time, we kind of share that burden, I guess. And so we have that in common and that helps us to form a connection.” During one interview, Audrey suggested that students should find a group that “speaks the same language.”

Attending a face-to-face meeting. In the face-to-face meeting that took place on the first night of class, the instructor explained the syllabus, presented all the important information about the course, and gave the students guidelines about finding a group. That night the instructor provided several activities (for example, asking about educational interest area), did a technology orientation (how to use HorizonWimba® and WebCT®), and then asked students to find a group. In this way, the instructor gave the students a chance to understand the course flow.

Though Gregory in Group One did not attend this group meeting, another group member, Audrey attended the meeting and shared what she had learned with him and with her other group

members. Gregory thought that was very helpful and recommended that students should attend the first face-to-face meeting:

If people could meet face to face, I'd think that would be a nice touch. You know, we live too far apart, I'm not even sure where they live but I know it is not close to here and it wasn't conducive for us to meet face to face. But I think if that is a possibility, I think it would help. We had that initial face to face meeting at the beginning of the semester and two of us didn't go to that [the face-to-face meeting] ... Audrey did [attend the face-to-face meeting] and so that was another way that the collaboration was helpful in that, she had gone to that group meeting and gotten more information that she shared with us and that was nice.

Audrey in Group One stated, "I would definitely recommend going to a face to face meeting when it is offered before every online class so that you can get a sense of who the people are in the class and you can match interests and abilities."

Choosing people that you know and have worked with before. Having worked together in a previous class was helpful for the members of Group One. Participants indicated that it helped them smooth their groupwork out and helped them know what to expect from the group members. Gregory stated "I think that helps smooth out...you know what to expect from the person. If you have that advantage, I think that it helps a lot going into it, what to expect from the group members." Audrey recommended, "If possible, find someone that they know, that they are familiar with...it just makes it easier when you know someone."

Communication

Checking email every day. Based on the interview data, it appears that communication is the most important thing for group collaboration. Therefore, when completing groupwork online, group members should take responsibility for checking email everyday. Gregory reported, "We were all pretty diligent about checking our emails, it worked fine." He suggested that it is important to "be diligent about checking email and sending out responses because when you've got other members waiting on you to move forward, it's good to have the quick responses."

Sending frequent emails even if it's something minor. To try to recapture a sense of connection with her group members, Audrey tried to send out many emails to get group members' feedback. She stated that "Whenever I got an email, I would email the person back and just say, "Great job on the work" or I sent out a lot more emails this month than I have in the past month just trying to elicit some type of response and so I think that helped because I kept sending out so many emails that I had to get some response."

Having a group synchronous meeting. Group One had difficulty communicating after the course communication mode changed from synchronous to asynchronous. Gregory expressed, "It is a little more difficult when we don't have a regular weekly meeting that you're all going to be online at the same time. So, it's been a little more difficult in terms of just making sure that you keep up with everything and remembering to stay on top of your emails and that kind of thing." Audrey suggested that students should have an online group meeting: "I would definitely suggest that they meet online at least once a week to verbally go and talk to one another to work out any issues or any kinks that are coming up."

Setting up a group communication protocol. When the students did not meet face-to face or synchronously, they perceived difficulty of communication as challenging. Group One members indicated that setting up guidelines and expectations for communications as well as for groupwork was useful. Audrey recommended that students should "set up a protocol where each group member is expected to respond to an email within a certain amount of time, whether it be twenty-four or forty-eight hours and with that, just to acknowledge that they have even received the email to begin with."

Strategies for instructors

The data analysis of interview transcripts from Group One indicated that the strategies for

the instructor include having a face to-face meeting; limiting group size; helping students to find a group; providing multiple communication methods for groups; setting up a WebCT® course site in advance before the first class started; providing an overall plan for the class; being involved in the groupwork process; and providing a mandatory weekly group activity during the asynchronous portion of class (see Table 4.6).

Table.4.6. Strategies for Instructors

Categories	Sub-categories	Group One	Group Two
Course Design	Designing for facilitating interaction	<ul style="list-style-type: none"> • Providing multiple communication methods • Providing mandatory activities during the asynchronous portion 	
	Providing an overall plan for the class	<ul style="list-style-type: none"> • Giving plenty of clear benchmarks about where students should be at certain points in the semester 	<ul style="list-style-type: none"> • Providing an overall plan for the class
	Preparing for technology	<ul style="list-style-type: none"> • Setting up WebCT course in advance before the first class started. 	
Groupwork Process	Helping group formation	<ul style="list-style-type: none"> • Helping students a find a group • Limit group size • Have a face-to-face meeting 	<ul style="list-style-type: none"> • Helping students a find a group • Providing group formation guidelines • Limiting group size
	Building a sense of connection		<ul style="list-style-type: none"> • Having face-to-face meeting • Providing time for group members to learn each others' background and skills
	Having students build virtual team skills		<ul style="list-style-type: none"> • Having students build virtual team skills
	Being involved in a groupwork process	<ul style="list-style-type: none"> • Being involved in a groupwork process 	<ul style="list-style-type: none"> • Being involved in a groupwork process
	Evaluating the process		<ul style="list-style-type: none"> • Evaluating group process

Having a face to-face meeting. As mentioned in the student strategies, students also recommended that the instructor should have an initial face-to-face meeting. Audrey's quote captured the sentiment of the group when she stated,

Definitely have the first face to face, the first class being a live class face to face because that way any questions that you have on the syllabus, those questions are answered and you understand what is expected of you because again, it's easy to get lost in an online setting. Plus if you're not familiar with the technology, you may not know how to ask a question or raise your hand, all of those things. I definitely believe that the first class should be face to face, that's helped me.

Limiting group size. As mentioned in the student strategies, students also recommended that the instructor should limit group size. Jennifer's quote expressed the overall group comments during the focus group:

I would definitely limit the number of people that could be in a group. For me, it's just been a lot easier working with a smaller group because you can have more interaction, more input. When you start getting six, seven, eight people in a group, it tends to be the same three talking every time because everybody else just kind of gets lost in the shuffle so it's not a true collaboration. So, I would definitely limit the group size. I can't think of anything else at the moment.

Helping students to find a group. During the interviews, two group members in Group One expressed that when distance learners, first time online learners, or students who do not know each other need to find a group at the first class meeting, it is hard for them. The instructor's assistance in finding a group will be helpful. Jennifer recommended that an instructor should assign students to a group in cases where a student is a first time student. Like Jennifer, Gregory also mentioned that it would be helpful if the instructor helped new students find a group with students who have done online groupwork before, "I think pairing the groups up, maybe assigning to the people who are new to it, put them in groups with other students who

have taken a couple of classes online.” Jennifer, who was particularly concerned about finding a group, stated,

My biggest thing is that I just wish that the professor would just partner us up before the class and say, ‘Here’s your group’ because for me and it being on an online course, I don’t know anybody to begin with necessarily especially being a distant learning student. I just wish my professor would say “Here is your group”, I feel like that would take a load off me because I get really nervous when I’m starting the class, “I need a group, I need a group” I remember feeling that way with my first class.

Providing multiple communication methods for groups. The instructor provided multiple communication methods. The students in Group One stated this was a good strategy enabling them to work with their group members by choosing their communication tool. Gregory stated,

We could use the discussion board, and each group has its own chat room within the Horizon Wimba® and so those are both options. He [the instructor] suggested face to face meetings if possible and email. He [the instructor] has done a good job of setting up several different options for communicating so that the group can decide what works best for them and what is most convenient for them.

Jennifer described that their group decided their communication mode according to their needs:

If we email [through email in WebCT®] if something comes up and say, “Do you want to meet in the chat room in such and such date at this time?” I mean, that would be something we’d do if we felt like we needed to talk. We have a plan that we decided. We knew we weren’t going to be meeting the class anymore and so we would emailing this way and we all agreed that it would be okay

Setting up a WebCT® course site in advance before the first class started. The instructor set up WebCT® course site before the first class started. Though two students in Group One did not attend the face-to-face meeting, they got some course information and formed a group in advance through WebCT®. It was very helpful for them to prepare for the online class and online groupwork. Gregory stated,

He [the instructor] had the WebCT all set up before the first meeting and so I was able to go on there and send an email to everybody looking for group members and I saw that Audrey was in the class and I knew her and so I emailed her specifically and said, “Do you want to be in my group again? I’m not planning on going to that first meeting” and so to have that set up in WebCT plenty in advance of the first class is nice because you can go in there and get an idea of who is in the class and if anybody else is looking for group members already.

During one interview, Jennifer also expressed how helpful it was that WebCT® was set up before the class began. This helped her with her group formation, “I felt so fortunate because Gregory emailed [through WebCT] the class at the beginning, “Does anybody want to be in a group?” and I was like, “Yes, I need a group.” So, for me, that was the biggest thing about starting the course, getting into a group.”

Providing an overall plan for the class. As the students did not meet the instructor regularly, they needed to have an overall class plan that included information such as when projects were due, a rubric, and examples. Gregory stated,

I guess maybe give plenty of clear benchmarks about where you should be at certain points in the semester.I like to have a good idea of where I am and where we need to go especially in a situation like this where you’re not meeting on a regular basis and seeing the professor and having those reminders in case you forget or feel distance from the course and material.

Being involved in the groupwork process. In an online learning environment, students do not see the instructor as they would in a face-to-face environment, so the students may not have as many opportunities to ask questions. Therefore, the participants reported that students need more feedback from the instructor. Jennifer in Group One expressed that she needed lots of individual guidance from the instructor about her groupwork: “This may be asking too much from the instructor, [but] I just want the instructor to break up that group work and tell us exactly what we have to do.” Gregory also stated, “The more feedback you can get from the instructor—

just to make sure you're on the right track and have a better idea of what they are looking for—the more comfortable you can be about completing the assignment.”

Members of Group One indicated that the instructor should be involved in the students' groupwork process and let them know if they are making good progress on their projects. Gregory stated, “[The professor] has been very good about offering that. We haven't felt the need to meet with him as a group, but it's nice to know that option is available if we were to need it.” Gregory also believed that the professor's involvement helped keep the students on track: “The more involved the professor is—even if he doesn't have to do a whole lot—it lets the students know they are on the right track.”

Providing mandatory activities during the asynchronous portion. During an interview, Audrey explained that the lesson plan feedback activity helped to promote interaction and communication between group members. Through the activity, Audrey's group had a chance to talk about the group project.

I think the other thing that helped this month is that we had the lesson plan even though it was individual work we had to submit a first draft to our group members to give us feedback and then based on that feedback we had to revise it and submit it to the professor and so I think that also helped the communication this month because we had other assignments due that forced interaction.

In an asynchronous online class, she suggested that the instructor should require students to have a mandatory online group meeting in order to facilitate communication and collaboration. For example, each week students “have to discuss the week's topic on the discussion thread, and that way everybody can view it and we can see what's going on.” That would help them to promote group communication and collaboration.

The lack of group meetings caused group members to feel disconnected and increased the difficulty of communication. Audrey suggested that the instructor should have students attend a weekly online group meeting:

The only way that an instructor could facilitate group work, I think, would be to have an online mandatory group meeting weekly during the asynchronous portion where say, yes, the entire class doesn't meet but each group meets in their break out room to work on group work because that may help.

Case Summary of Group Two

The group members in Group Two suggested some strategies for students and instructors that could be implemented to assist students in completing groupwork online. The data analysis of interview transcripts from Group Two indicated some strategies for students. The strategies included three areas: (1) group formation (having a small group, finding a group based shared interest), (2) communication (checking email everyday and the website for the class, sending frequent emails even if you think it is for something minor, having a group coordinator), and (3) sense of connection (attending a face-to-face meeting, spending time together socially) (see Table 4.5.).

Strategies for Students in Group Two

Group Formation

Having a small group. Group Two had a small group consisting of three members. During the group interview, participants reported that it was easy for them to divide their groupwork among each member and also to communicate. They also indicated that having a small group helped them to have equal responsibility and get to know each other easily. Marie stated, "I would probably suggest that I think small groups are better than larger groups. I think

when you have a large group it's hard to divvy up the amount of work so that it is even. When you have three people, it's easier to break things up.”

Finding a group based on shared interest. The group members in Group Two had the same educational interest area, which helped them to get to know each other easily. Marie expressed their educational background in K-12 was helpful for building a sense of connection, , “It was part of all of us came from an education background so that probably helped with us being able to work well together. Julia in Group Two also stated that

I guess, you know, interests ... the focus of, having some sort of focus within the class, like choosing the business route, the education route, the early childhood, you know, kinda finding those people. So probably finding people with similar interests or people that you have positive relationships with helps.

Communication

Checking email and the website for the class everyday. Online groupwork requires a lot of interaction, so communication is important. Students need to go to the website for the class every day just to make sure they get the communication. Brad did not check emails everyday at the beginning of semester, so he missed a lot of messages and responded late to the other group member's emails, which caused delays. He suggested that students should check email and the website for the class every day:

The biggest suggestion is like in terms of communication, check the emails everyday. Like I think the first time I met with you, after that I realized “hey, this is something I need to do” because I wasn't doing it. I was checking it like every four or five days and I missed a lot of messages and it takes awhile because...not only is there the email, there is also the discussion boards and the discussion boards, other people in the class put up some their work of the same project and you read it and can reply back to it.

Sending frequent emails even if you think it's something minor. Communication is important among group members. Two participants in Group Two indicated that keeping in touch, even by means of short notes, helped group members to stay on the same page in the

group project and also to stay connected with their group members. Brad in Group Two recommended, “Always stay in communication even if it is to write a short note just to let them know that you’re still there and reading emails and if they need to talk to you about anything.” Julia also advised, “Use email or communicate even if you think it’s something small.”

Having a group coordinator. During the interviews, two group members reported that the group coordinator did a good job as a facilitator and motivator. The group coordinator made the group process run smoothly. Their group members mentioned that he facilitated the communication among the group members. Marie commented about Brad’s role, “Brad was a good moderator. He was really good at letting us know when we would meet again, and then if we couldn’t meet, he would email us the information and things like that.” Julia also emphasized the importance of having a group leader: “First of all, it’s good to have a leader who is going to kind of monitor the group.”

Sense of Connection

Attending a face-to-face meeting. During an interview, members of Group Two reported that the face-to-face meeting gave the group members a chance to get to know each other. That helped group members to build a sense of connection and helped group formation. Marie and Julia perceived attending the face-to-face meeting as beneficial. Julia stated, “I think probably the best thing that helped the group was the first night and kind of feeling out each other, you can tell that we could work together. It was just sort of easiness socially the first night. . . we’ve both taught and so we can totally relate.” Marie also mentioned, “I think another thing, because you’re online, you’re not seeing people, someone, that you do build a connection with that person. It helps to have met them, like the first day, to kinda know a face.”

Spending time together socially. Members of Group Two indicated that getting to know each other on a personal level helped them work well together. Julia expressed that having time to interact socially at the group meeting helped her group work very well. Likewise, Marie suggested that students should spend time together socially for groupwork:

I think maybe just spending the time together. I think that helped make the group better and maybe spending a little bit of it socially. You know, we did talk and play, laugh and things like that it but were still able to do the work. So, maybe sometimes not just doing work but sometimes doing something socially. But I think what we did, we worked well together.

Strategies for Instructors

The data analysis of interview transcripts from Group Two indicated that the strategies for the instructor include providing group formation guidelines; helping students to find a group; providing time for class members to learn each other's background and skills; having students build virtual team skills; providing an overall plan for the class.; being involved in students' groupwork process; and evaluating group process (see Table 4.6).

Providing group formation guidelines. On the first night of class, the instructor limited the group size and asked the class members to form groups based on shared educational interests.

Having guidelines about the size and background of the group was helpful for forming a group. Julia stated,

I think setting like a minimum of group members and then also [the professor] did this which I thought was very helpful, sort of the focus of the group was going to be this and this, say K-12 with a non-language arts. That helped me because I'm the oddball typically in this class so it helped me know that I was not going to be with the business group. So, that helped when you have the size and background of the group.

Marie in Group Two stated that her group had a small group size, so it was easy to communicate with each other. Brad suggested that the instructor should limit the group size:

I really think three is the best for some reason. Five is too many and some people get lost in the shuffle. Like if it was me, I wouldn't allow a group of five. ...So, I'd limit the group size. I would make the projects relevant in terms of...we're all interested in Instructional Technology and so since the projects have to do with that, with research, I think we are all interested.

Helping students find a group. In the first face-to-face meeting, it was hard for students to find a group in a short time. Julia suggested that the instructor should help:

Sometimes it [finding a group] is dictated by teachers or professors. That is a challenging part, because the way that it's done, it's so quick. Like the first night of class, you select a group. That took, I mean, it's like, well I don't know anyone here! And you kinda have to judge, make these judgments really quick

Like Julia, Brad in Group Two mentioned that he had difficulty finding a group in his previous class. He suggested that the instructor should put students in with their interest groups. "He [the instructor] put people in with their interest groups and that way you just sort of gravitated. and put a project together and to do that was good. I think putting some thought to how you form the groups is very helpful."

Providing time for group members to learn each other's background and skills.

Knowing group members' background and skills is important because groupwork requires group members' skill and knowledge. In the initial face-to-face meeting, the students reported that they did not have time to talk about their backgrounds. During the interview, Julia in Group Two expressed her lack of knowledge about her group member's skills and backgrounds because she met her group members only one time. Marie suggested that the instructor should give students enough time to learn about their classmates' background and skills:

One of the things he tried to do sort of but wasn't able to do was to...get people to talk about their backgrounds so that they had a little idea of whether or not they connected at all..... It would be very confusing to have an education person working with business people because you wouldn't have a connection there. And I thought it would be more

beneficial, they would think of it in a different way. So, I think the instructor just giving you time to learn about each other's background would be a good suggestion.

Having students build virtual team skills. Comfort level with technology is important for communicating with group members or with the instructor. In particular, in the synchronous online learning environment, one student's technology action impacted the other students. Therefore, the instructor should teach the students how to use communication tools, and the students should follow the communication rules. Marie explained that it is annoying when people do not know how to use the technology:

My biggest suggestion is making someone everyone understands how the technology works as far as like people keep pushing the control button to talk. That irritates me. I guess it's because unless they're talking ... it's like you look at it like a TV screen almost, and so every time you see [the professor] talking, and then someone cuts in, it's like, you half hear what he's saying, and so it's frustrating.So just being clear on the rules of using the technology, making sure everyone follows that. Because it just gives everyone a sense of feeling comfortable about what they're doing.

Julia expressed that group work requires "a very multileveled social interaction for me because it is very social and it involves communication skills and academic skills and it involves personal skills." She suggested that the instructor should address groupwork process, strategies, and characteristics of groupwork:

I'm thinking about it, it would be kind of interesting for professors to actually address group work. I think in a way they kind of assume we know how to do it and I think in a way they kind of assume that everyone is real comfortable with it. Well, I assume they are assuming because they aren't talking about it. I don't know, many professors never really...we never talk about even how we're handling things. And yet, if this the main component of our program, so we're not even talking about it or even analyzing it or even noting what are some possible sort of...characteristics or strategies. So, I'm learning too much. I'm learning about group work and I'm learning my content area and I'm learning social skills and then I'm learning how this works out in the real world.

Providing an overall plan for the class. During the interviews, participants in Group Two indicated that having a mini-deadline and deadline helped group members to keep a timeline for

doing the group project. Julia and Brad in Group Two also stated that deadlines, criteria, check lists, and examples were helpful. Brad commented on the usefulness of the detailed guidelines the instructor provided for the group project:

The guidelines are important for the group project. He has that in his syllabus. And it is really clear. It is well done. I need to go over it again this weekend. But it is all there, he's very good at doing this class. So, in terms of facilitating group work, [the professor] has done a great job of making sure everyone can communicate and the guidelines are known and you can always reach him, too, and he's really good at getting back to you.

Additionally, Marie suggested that the instructor should provide a timeline of what it is that they are supposed to do:

As far as the group work, I would suggest maybe a timeline of what it is that they're supposed to do, just some ideas of how much time you might take doing certain things, just so that the group can kinda be aware what time constraints they're in. Because we know what the due date is, but it's also helpful to kinda have an idea, of someone who has done this before, to kind of give you an idea of how long it takes to do certain things, just some suggestions of that.

Participants in Group Two also indicated that weekly announcements helped students in Group Two to prepare for the week's activities and assignments due. The instructor provided a list of what students in a group should complete each week on the main page of class web-page. He announced weekly information updating the heading on the web-page that helped the group members figure out what they should do. Brad stated,

I do like about [the professor] is like in the homepage of the class, he has kind of like every week, he sort of puts instructions like what you should be doing this week. I think that has been a real help he [the instructor] facilitated it like "Just go to the website" and he's got bullets, "Your team members have to put in their rough draft, you have to prepare your slides for this subject" and I think that's been really good.

Being involved in students' groupwork process. During the interviews, group members in Group Two reported that the instructor should try to touch base with the group members as

much as possible. The instructor should monitor their group work process and ask if there is any problem. Marie thought that the instructor should

Check in on the group and see how they are doing with the projects every once in awhile, just drop them an email and asking, “Is everything going okay? Is there anything I can do?” I mean, I know they are busy, too, but I think for the people to feel more involved in the class, that if they the instructor is kind of checking on them and making sure that they are doing okay and that there are no issues with the group.

Evaluating group process. During the interviews, group members in Group Two reported that it was difficult for students in Group Two to evaluate their group members, especially as one group member did not participate in groupwork. He stated that “I personally feel like the evaluation is the teacher’s role. Like, as a student, my role is not to evaluate my team mates.”

Julia and Brad suggested various ways that the instructor could be more involved in group evaluation. Julia suggested that the instructor should provide a group evaluation rubric or checklist for group evaluation. Additionally, she thought that the instructor should have students submit individual work samples: “When we submitted our draft, I think I should have submitted the part that I wrote. So that would be an indicator of how much I invested in a project.” Finally, Brad suggested that the instructor should assign a group meeting time, attend their group meeting, and evaluate each group member.

Result of Cross-Case Analysis

A cross-case analysis of the participants’ suggestions for making groupwork and collaboration more effective indicated that the two groups suggested similar strategies for students and instructors that can be implemented to assist students in completing groupwork. Table 4.7 summarizes the similarities and differences between the two groups regarding strategies.

Table 4.7. Similarities and Differences between Two Groups Regarding Strategies

Strategies	Group One	Group Two
<i>Strategies for Students</i>		
Similarities Across Groups	<ul style="list-style-type: none"> • Attending a face-to-face meeting. • Finding a group based on shared interest. • Having a small group. • Checking email every day. • Keep sending out many emails even if it's something minor. 	
Differences Between Groups	<ul style="list-style-type: none"> • Choosing people that you know and have worked with before. • Setting up a group communication protocol • Having a synchronous group meeting 	<ul style="list-style-type: none"> • Having a group coordinator • Spending time together socially.
<i>Strategies for Instructors</i>		
Similarities Across Groups	<ul style="list-style-type: none"> • Helping students to find a group • Limiting group size • Having a face-to-face meeting 	
	<ul style="list-style-type: none"> • Being involved in the groupwork process 	<ul style="list-style-type: none"> • Helping students to find a group • Providing group formation guidelines • Limiting group size
	<ul style="list-style-type: none"> • Provide an overall plan for the class 	<ul style="list-style-type: none"> • Being involved in the groupwork process
Differences Between Groups	<ul style="list-style-type: none"> • Providing multiple communication methods for groups. • Setting up a WebCT course site in advance before the first class started. • Have a mandatory weekly group activity during the asynchronous portion of class. 	<ul style="list-style-type: none"> • Having students build virtual team skills • Evaluating group process • Providing time for group members to learn each others' background and skills

As the course structure changed from synchronous to asynchronous, the two groups suggested different strategies for students and instructors that can be implemented to assist

students in completing groupwork. Table 4.8 summarizes the differences between Asynchronous/Synchronous during Class Time regarding strategies.

Table 4.8. Differences between Suggested Strategies during Synchronous/Asynchronous Class Phases

Strategies	Group One	Group Two
<i>Strategies for Students</i>		
Phase One (Synchronous)	<ul style="list-style-type: none"> No differences noted 	
Phase Two (Asynchronous)	<ul style="list-style-type: none"> Set up a group communication protocol Have a synchronous group meeting Keep sending out many emails even if it's something minor. 	
<i>Strategies for Instructors</i>		
Phase One (Synchronous)		<ul style="list-style-type: none"> Have students build virtual team skills
Phase Two (Asynchronous)	<ul style="list-style-type: none"> Provide an overall plan for the class Provide multiple communication methods for groups. Have a mandatory weekly group activity during the asynchronous portion of class. 	<ul style="list-style-type: none"> Provide an overall plan for the class

Summary

In this chapter, I presented the findings from this study. This chapter provided a brief description of the participants in the two groups. Additionally, I presented case summaries of each of the two groups as separate cases to describe the group members' perceptions of group interaction. Finally, I provided a cross case summary of the two groups.

In this study, the two groups shared a perspective regarding some of the factors that were helpful and challenging—for example, they both suggested similar strategies for students and

instructors—but regarding other factors they differed. For example, the individual group members had different levels of satisfaction with their online groupwork and also had different perceptions of online groupwork. In the next chapter, I present a discussion of the findings from this study.

CHAPTER V

DISCUSSION AND IMPLICATIONS

Overview

In Chapter Four, I summarized the findings from this study. In this chapter, I discuss the implications of these findings. The chapter consists of three sections: a discussion of the research findings, the implications for practice, and suggestions for further research.

Figure 5.1 is a reproduction of the diagram depicting the conceptual framework introduced in Chapter Two. As indicated in Chapter 2 based on the review of the literature, it provides a model for understanding how various factors are operationalized in an online class. These factors affect students' perspectives of group interaction as well as their perceptions of the critical factors that affect group interaction.

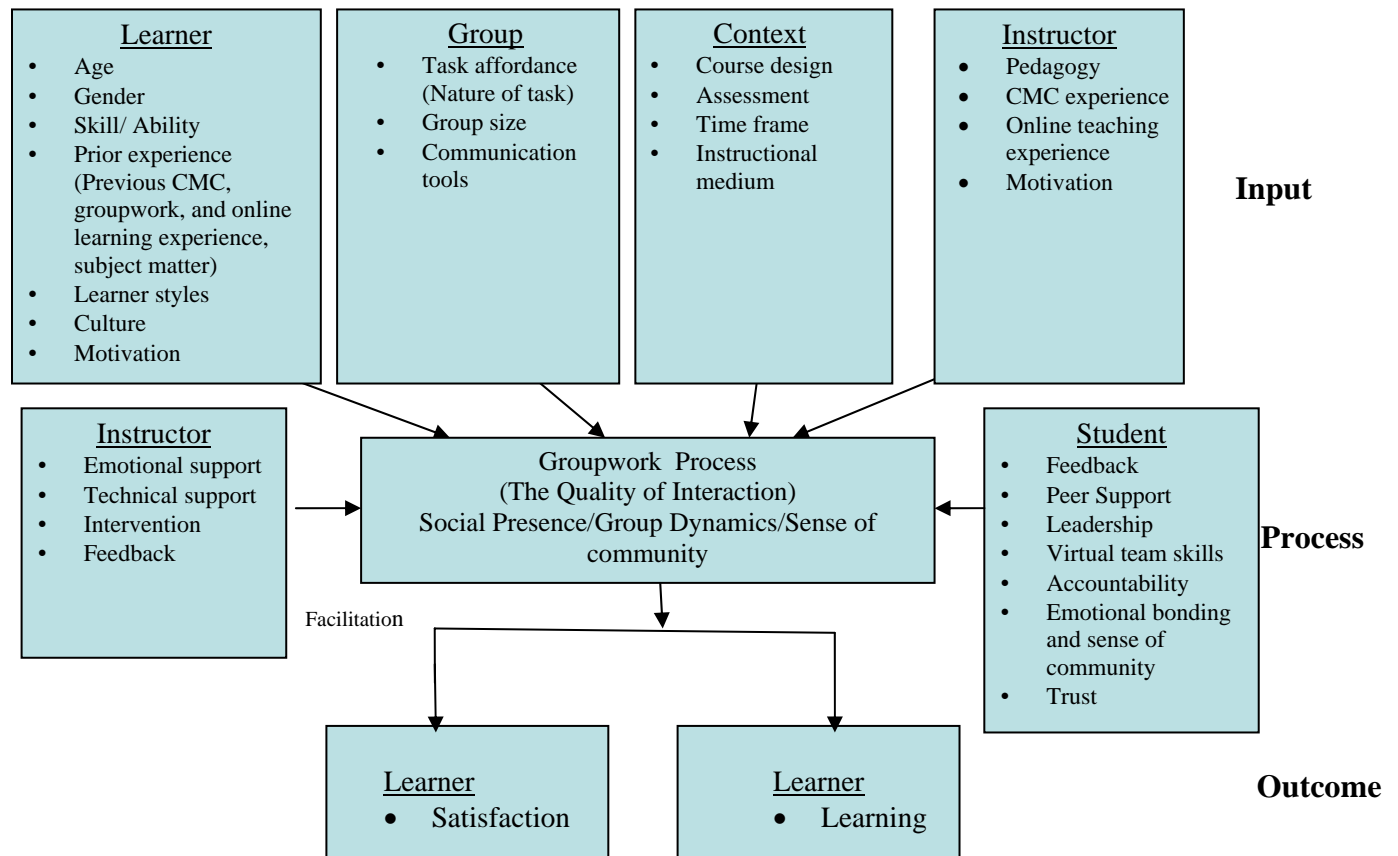


Figure 5.1. Reproduction of the conceptual framework introduced in chapter two

Similar to the conceptual framework, this study identified the factors of online groupwork that students recognize as being challenging or helpful in the learning process over time. These factors are categorized into learner characteristics, group characteristics, technology, course design, students' group process, and instructor's group process. In an input-process-output-dynamics model, the input elements influence group processes, which in turn impact group members' satisfaction and learning.

There are similarities and differences between the conceptual framework, which is based on the literature, and the findings of this study. These are summarized in more detail below. I present the information in each category (input, process, outcome) and for each area within the larger categories (e.g. learner).

The Input Level: Similarity and Differences

Learner. Among the learner characteristics in the conceptual framework, previous experience (online class, groupwork, and online groupwork), previous CMC experience, and skill were found in this study. Some factors such as gender, learning style, culture, and motivation were not found in this study. Additionally, this study identified work habits as a helpful factor that was not reflected in the conceptual framework.

Group. Among the group characteristics in the conceptual framework, group size and task were found in this study. In this study, participants did not distinguish between instructional tools and communication tools. From the participants' perspective, the online learning environment where they worked together included instructional tools, communication tools, the network, and emails. Additionally, this study identified shared interest and shared profession and as helpful factors in this study which was not in the conceptual framework.

Context. Among the context characteristics reflected in the conceptual framework, two elements of course design were found in this study: course design and assessment.

Instructor. The instructor's characteristics in the conceptual framework were not indicated as helpful or challenging factors in this study.

The Process Level: Similarity and Differences

Student. Among the student processes, all factors in the groupwork process such as feedback, peer support, leadership, virtual team skills, accountability, sense of connection, and trust were found in this study.

Instructor. Among the instructor processes, this study found that as a facilitator, motivator, guide and coordinator, the online instructor plays an important role in offering guidance, feedback, and support in online learning environments.

Additionally, time and communication were found to be challenging factors in this study, but these factors were affected by other factors such as accountability, time frame of the course, and individual environment.

Outcome Level

Learner. The participants did report satisfaction with the online group work in this study. Participants also reported that they learned during the course that was the context for this study. Five students out of six reported learning through groupwork.

With the conceptual framework as an overall organizer, I will discuss the findings of this study in more detail. The discussion is organized according to the research questions.

Discussion of Findings

Research Question One. What factors of online groupwork do students recognize as helpful in the learning process over time?

In research question one, I sought to identify students' perspectives related to small group interactions and to investigate critical factors which impact group interaction. The results indicated that the two groups identified the following factors as being helpful in online groupwork:

- Learner characteristics: previous experience with online, groupwork, and online groupwork, previous CMC experience, work habits
- Group characteristics : group size, shared interest, shared profession
- Technology: convenience and flexibility of an online learning environment
- Groupwork process : sense of connection, feedback from group members

However, the two groups also perceived different factors as being helpful in the learning process in online groupwork. While Group One perceived equal responsibility and trust as being helpful, Group Two perceived peer support, emotional support, leadership, and feedback from the instructor as being helpful.

Learner Characteristics

Group collaboration appeared to be influenced primarily by individual students' characteristics. In this study, individual characteristics impacted student social interaction, the group development process, and satisfaction. Individual characteristics included previous experience, previous CMC experience, work habits, and profession.

Previous experience (online, groupwork, online groupwork). In this study, most of students reported that previous experiences helped them to know what to expect regarding an online course and the technologies of HorizonWimba® and WebCT®. Even when their previous experience was negative, it helped them to prepare for online groupwork. That helped them do online groupwork more easily. For example, most of students had difficulty using the

HorizonWimba® classroom in their previous online classes. Their experiences made them aware that they needed to prepare for the synchronous classroom, and they had their own strategies for doing so. Jennifer and Gregory in Group One accessed the system early before the class began to make sure they were online and prepared. Jennifer talked about her own strategy: “Be prepared to be using the computer and make sure your computer works. Just be aware that it is not going to be the same as a regular classroom.”

Their previous group experiences also helped them to make conducting the online group work a little bit easier. In the group interview, Group Two reported that even when their previous groupwork experience was negative, the experience helped them to work together online and that positively affected their group dynamics. Students' lack of experience with groupwork present challenges (Drury, Kay, & Losberg, 2003). For example, Julia in Group Two had previous experiences with groupwork in face-to-face settings, which made her confident in her online groupwork: “After doing group work for previous classes, I’m a lot more confident and comfortable with how groups function this semester.” She also had her own strategies for dealing with her group members: “I just say use prior experiences and if a group is not really functioning, you have find a way to make it work for you.”

These results imply that previous experiences online, with groupwork in face-to-face settings and with online groupwork were helpful for online groupwork. Previous experience may enable students to diminish their challenges and develop their own strategies for both technology and groupwork. Their previous experiences gave them the skills and abilities they needed to do online groupwork well such as how to use HorizonWimba® and WebCT® and how to negotiate groupwork, so they were able to communicate and interact with their group members. That may

have impacted their group interaction and their group dynamics. Students' prior experience may have affected their perception of learning (Rovai & Barnum, 2003).

Previous CMC Experience. Comfort level with technology was reported to be a helpful factor in this study. Comfort level with technology may be formed through previous CMC experience. In this study, if participants were unable to listen and talk using technology, they did not participate in groupwork. In the group interview, the students agreed that comfort level with technology impacted group interaction and group dynamics. Online groupwork relied on technology, so each group member's technical skill is important for online group process and development (Gunawardena et al., 2001). Audrey in Group One stated: "If you're not familiar with the technology, you may not know how to ask a question or raise your hand, all of those things....if you don't even know how to work in the system, you're not going to be able to interact with your classmates."

Students' technical skills and ability to use the collaborative tools may impact both interaction and satisfaction (Benbunan-Fich et al., 2005; Carabajal et al., 2003; LaPointe&Gunawardena, 2004). The learner may be frustrated with online groupwork if a comfort level with technology is not reached. In an online course, previous CMC experience may help students have the technical skills that enable them to interact and communicate with their group members. Evaluating students' comfort level with technology may be helpful to students at the beginning of the semester so that they can work on developing the skills needed to facilitate online groupwork.

Work habits. Group members' work habits were a helpful factor for both groups in this study. Participants reported that their working habits included dividing their groupwork among group members equally and participating in their groupwork equally. In the group interviews for

this study, participants indicated that their working habits benefited their collaboration and group dynamics. Work habits are on display not only when students study alone but also when they collaborate with others (Corno, 2004). Students' work habits impacted their task performance (Motowidlo, Borman, & Schmit, 1997). In online courses, students may have greater control over their individual learning, but when they are involved in groupwork, they have greater responsibility for the work of their group. With this comes increased responsibility for completing assignments and being prepared (Schrum, 2002). As indicated in the literature, unfamiliarity with group members' work habits can affect group productivity (Goodman & Leyden, 1991). Noticeable differences in work habits among group members may hinder interaction and collaboration. Therefore, having good work habits is important. Therefore, the instructor should help students to enhance group members' familiarity with one another and should promote collaborative work habits.

Group Characteristics

Results of this study indicated group interaction and collaboration are affected by group size, shared interest, and shared profession.

Group size. Group size was an important contributing factor for groupwork in this study. In this study, the two groups were comprised of three members. Students reported that having a small group helped them to get to know each other more easily in an online learning environment and to distribute their group work among group members equally. For example, in the HorizonWimba virtual classroom, students participated in several group meetings that lasted twenty minutes. Transcripts indicate that everyone was able to communicate even in a brief twenty-minute meeting. Members in a group had more opportunities to interact in an online synchronous group meeting. Audrey in Group One suggested the ideal group idea size: "Small

groups (2-4) work better because there is no where for someone to hide” However, Julia in Group Two mentioned that group size “depends on the nature of the project. I don’t think our group being a size three is perfect, but I think that certain projects have a greater impact on a group of three than on a group of four or five.”

The literature also indicates that group size is an important variable affecting group interaction. In synchronous online group discussion, group size is an important factor for engaging learning (Beatty, 2002). Mebane and Galassi (2000) also indicate that group size (too many or too few) causes dissatisfaction with the group work experience. Group formation is one of the most important activities related to the success of online groupwork (Graham, 2002; Graham & Misanchuk, 2004). Having a smaller group with a manageable project is more likely to lead to effective collaboration without frustration (Robertson & Hewitt, 2006). Group work in a project is best when a group includes three or four members, while a group for decision-making can be slightly larger (Bruffe, 1999; Nelson, 1999). Group size also affects the equality of interaction and the contribution to a shared project. Small groups support building strong group relationships and a sense of community (Han & Hill, 2007). In online courses, having a small group may enable students to communicate and interact with group members easily in synchronous online learning environment. Through interaction, they may build a sense of connection more easily.

Shared interest. In this study, all the participants in the two groups had a shared interest in K-12, all were educators, and all had taught. In the interviews, participants indicated that shared interest in K-12 helped them to get to know each other easily, and made them feel more comfortable working together. For example, Audrey in Group One stated that “it is a lot of easier because our group is all K-12 setting We all understand the lingo, some of the jargon

whereas in the business portion of it . . . if it doesn't make sense to me I first have figure out what they are talking about.” They also indicated that their shared background helped them to build a sense of connection and to communicate easily. For example, Gregory in Group One stated: “Knowing that we all teachers working in the education field provided a strong connection.”

In the literature, one of the important considerations in forming a group is whether a group will be homogeneous or heterogeneous. There are advantages and disadvantages for each. While homogeneous groups tend to be more cohesive (Graham & Misanchuk, 2004; Perrone & Sedlacek, 2000), heterogeneous groups can bring multiple perspectives to the group discussion and work (Cohen, 1994; Tu, 2004). When students have a heterogeneous group composition, the group “takes longer for team members to develop social relationships and to reach a comfort level sufficient to share and exchange information and ideas” (Tu, 2004, p. 34). Given that is this case, homogeneity may work better for group-related to project discussions. In fact, heterogeneous group composition could be a contributor to communication difficulties and frustration that students experience in project-building group negotiations (Robertson & Hewit, 2006). In an online course, homogenous grouping may be more effective for students who are from different geographical areas because it can lessen frustrations and problems (So, 2006).

Shared Profession. The two groups perceived having a commonalty as educators as being helpful. During the interviews of this study, the group members reported that their teaching background helped them to understand the K-12 classroom environment, to feel more comfortable with each other, and to build a sense of connection. They also reported that they could get realistic feedback from each other and benefit from different teachers' perspectives. For example, Marie indicated how her background help her to understand the other group

members: “We all have the understanding of how we kind of go about building up lesson plans and what really happens in the classroom as far as our scenario [weekly group assignment].” In online groupwork, their teaching background and their subject knowledge regarding K-12 classroom environment may enable students to engage in meaningful discussion with the other group members (Beatty, 2002).

Technology

The results of this study indicated that group interaction and collaboration is affected by both the instructional tool for an online class (WebCT® and Horizon Wimba®) and the communication tool for a group.

Convenience and flexibility of the technology. Online groupwork was perceived as beneficial by many of the students in the two groups. One predominant reason given was that the online learning format provided the learners with flexibility in terms of not having to be in a particular physical location to attend class. Further, participants indicated that the convenience afforded by the flexibility also assisted with participation in class. For example, although the students did not meet face-to-face, group members communicated with each other, exchanged their ideas, received feedback through the bulletin board or email, and had group discussion through chat forums or telephone. In the interviews, three group members in Group Two described how they collaborated as a group in a synchronous online learning environment. They reported that the technology enabled them to overcome the limitation of geographic location and collaborate with their group members. Brad in Group Two reported that his group collaborated very well through the online learning environment: “I felt it was nice being able to have communication with my partners and also be able to do that from home which made it very comfortable.”

Regarding the benefits of technology, Gregory in Group One also described how he could communicate with his group members even though he never met them face-to-face throughout the whole semester: “I met Audrey once last semester, and I’ve never met Jennifer, but I feel like we know each other pretty well and work well together. Ten years ago that was unheard of so it is just amazing how technology enables us to collaborate with someone we’ve never met.”

Research has indicated that technologies can provide a socially supportive environment for knowledge construction in a collaborative learning environment (Kitchen& McDougall, 1999; Stacey, 1999). Technology also facilitates personal connections among group members, as well as enhances the degree of social presence among them (Durate & Snyder, 1999). The effective use of technologies plays an important role in communication and collaboration over time and distance. Also, technology can affect student interaction and satisfaction. The participants in this study illustrated how the use of technology can support the group process and how technology enabled them to collaborate with someone they had never met.

Groupwork Process

During the groupwork process, several factors impacted students’ learning and satisfaction. These factors included trust, sense of connection and/or emotional support, group dynamics, feedback from group members and the instructor, peer support, and leadership.

Trust. Trust was indicated as a helpful factor for online groupwork by Group One in this study. Trust is “the feeling that the community can be trusted [and] represents a willingness to rely on other members of the community in whom one has confidence” (Rovali, 2001, p. 197). This includes understanding the impact of the groupwork and of one’s own actions on other people within the group. In the group interview, Group One reported that trust made group members feel satisfied with their experience doing groupwork. Knowing members before this

class helped them to have group confidence and to know what to expect from the other group members. The members of Group One expressed trust in their group members. For example, Jennifer in Group One described in her first interview, “I don’t really worry about my group. . . . I feel confident that together we will get the project done and we’ll do a good job.” However, the members of Group Two expressed some doubts regarding their groupwork during the interview in March. Julia in Group Two said that she “wondered if the group is going to work, if groupwork is going to be done, and if the groupwork is going to be of a good quality.”

Similarly, trust is an important factor discussed in the literature. Trust may help the group to develop more effectively (Palloff & Pratt, 2005; Tu, 2002). Brown (2001) pointed out the importance of being acknowledged and respected in building trust in a community. This study showed the benefits of trust as Audrey in Group One reported, “I didn’t have to worry that something was not going to be done.” Thus, online instructors should provide increasing opportunities for learners to get to know each other and to build trust in one another, with the goal that learners will be able to turn into a community.

Feedback from group members. Feedback from group members helped individuals in the group identify what they missed or overlooked in assignments and projects. Participants indicated that feedback impacted their satisfaction with groupwork and with group members. In addition, Brad stated that feedback impacted learning, “I think I would have learned even if I’d done it individually but it was a different experience working with a group I think the reason why is because my team mates were able to provide input that maybe I hadn’t seen.”

Several researchers have indicated that peer feedback is necessary for encouraging meaningful interaction (Johnson & Aragon, 2003; Nothrup, 2001, 2002; Woo, 2006). However, research has also indicated that asynchronous student-student review and feedback (Beatty,

2002; Vrasidas & McIsaac, 1999) may be influenced by student motivation. Incorporating techniques in online groupwork that encourages feedback are an important consideration.

Sense of connection and/or emotional support. While the two groups were involved in their group projects in the synchronous environment, the students reported that they felt a sense of connection. For example, Brad in Group Two expressed his sense of connection with his group members: “We have a strong sense of connection especially on this last meeting. I think there was a real sense of camaraderie.” Gregory in Group One also expressed how the online group’s sense of connection was different from face-to-face group work: “We don’t have that same connection that we’d have working face to face in a classroom setting, yet I think we’re pretty comfortable working with each other and talking to each other.”

Receiving emotional support was reported as helpful by Group Two. Emotional support included “emails that will say something positive [like] ‘We’ll get this done’ or ‘We’ll sort this out.’” This kind of emotional support motivated them to work more and more with the group. During the group interview, they agreed that emotional support from group members impacted their satisfaction with online groupwork experience and motivated them to work more with the group. However, Group One reported that their group did not need emotional support because of the type of groupwork. As stated by Gregory in Group One: “If I don’t think we really needed a lot of that.”

Emotional bonding with group members has been reported to be a critical factor in student perceptions about social presence (So, 2006), a feeling of community (Rovai, 2002) or connection (Gunawardena & Zittle, 1997) among learners. The present study provides evidence for the benefits of emotional support as Brad in Group Two reported, “We felt lucky that we had each other in the group . . . we felt really blessed that we got good group members.” Thus

familiarity with group members, informal relationships, and more trusting relationships should be promoted (So, 2006; Tu & McIsaac, 2002).

Peer support. In this study, peer support was found to be helpful to Group Two for online groupwork. In their group project, the three members took three parts that were all interconnected. Marie's work impacted Brad and Julia's work. Thus they needed to interact in order to complete the project. The group members in Group Two had different skills—Julia had good writing skills, Brad had good communication and editing skills, and Maria had storytelling skills, thus the group members' strengths helped balance other group member's weaknesses. The students supported each other's learning through weekly group activities and through the group project. In Brad's words, "We've really helped each other out."

The literature provides evidence that peer support was found to impact students' experience with collaborative learning (So, 2006). Peer support is a key factor in the success of the online learning (Northrup, 2002). Students supported and helped each other to obtain successful group process and products. The peer relationship also affected group development and peer performance (Zhang & Ge, 2006). As Julia in Group Two suggested, "Make some sort of personal connection with the people in your group. Communicate what you need." Thus an online instructor should help students build peer relationships, which may help and support their online groupwork.

Leadership. A group coordinator's leadership was reported as helpful in this study. For example, in both the individual and the group interviews, two group members in Group Two reported that the group leader was a good moderator and had good communication skills. He helped the group to run their groupwork smoothly. Their group members mentioned that he was

like a moderator or a sort of editor, and he facilitated the communication among the group members.

The literature also reiterates the importance of a group leader in an online group. In an online class, a leader should be assigned in order to enable the process to flow smoothly (Palloff & Pratt, 2005). To increase the likelihood of success, leaders should be chosen “based on increased attention to their ability to communicate and develop relationships with team members” (Chimnosky & Roja, 2003, p. 100). In the present study, the group leader’s communication skills played an important role in the group’s perceived success.

Equal responsibility. Having equal participation was perceived by Group One as helpful. As the interviews indicated, they reported that they divided their groupwork among group members equally and participated in their groupwork equally. Everybody pulled their weight. In Gregory’s words, “We all kind of shared that [the leader] role equally.”

Research had indicated that shared responsibility can enable students to be actively engaged in the learning process. This engagement contributes to an enhanced sense of community among the students (Hong, 2004). In this study, Audrey expressed that sharing the group leader role and having equal responsibility contributed to the group perception that “everything is pretty smooth” in their online groupwork.

Feedback from the instructor. The instructor’s feedback was perceived by Group Two as helpful. During the individual and the group interviews, they reported that when they submitted their first draft for their group project, the instructor provided very useful feedback for improvement and specific goals and tasks for them to accomplish these goals. Through the instructor’s feedback on the group project, they were able to see the instructor’s expectations and adjust what they had done to what he really wanted and “what he expected to see.” They also

reported that the instructor's feedback made them feel more satisfied with the group work when they got positive feedback and a good grade.

Like the benefits of peer feedback, several researchers have indicated that the instructor's feedback is helpful to students by providing guidance which makes their online group work well together (Melrose & Bergeron, 2007; Northrup, 2002). Online instructors should provide prompt and detailed feedback on their groupwork.

Research Question Two. What factors of online groupwork do students recognize as challenging in the learning process over time?

Research question two also sought to identify the students' perspectives related to small group interactions and to investigate critical factors that challenged group interaction. The challenges the participants perceived over time included

- Task, technology, communication, accountability, and feedback from instructor (two groups).
- Writing and research skills, and time management (Group Two).

Individual Characteristics

Writing and research skills. Different levels of writing and research skills were found to be a challenge in this study. For example, the group project for Group Two required extensive writing and research. The group members had different levels of skills, and they indicated they helped each other to complete their project. However, they also indicated that their different skills made them frustrated. For example, Marie expressed her frustration with her limited research skills: "I'd never pulled information for research before and tried to incorporate in a paragraph form like that. It didn't [go] well." While Julia helped the other group members with the citations and research, she was also frustrated by the limited skills of some of her group

members, stating: “I would have to say, back to the frustration, was that I was sort of surprised at some of the lack of skills that some of these people had.”

The research literature indicates that an individual’s skill level affects interaction (Beatty, 2002) and satisfaction in an online group (Benbunan-Fich et al. 2005; Carabajal et al., 2003). In a group, though students may lack some skills, the group members’ strengths should help to compensate for other group member’s weaknesses. As Marie in Group Two stated, “So, it made us work well together because instead of being weak, we used our strengths and we each built up our weaknesses through helping each other.” Encouraging students to support each other and share skills may be helpful for online groupwork.

Group Characteristics

Task. Online collaborative groups require more time to achieve a consensus through computer-mediated communication (CMC) (Tu, 2003). There is the risk that a team may not be able to accomplish some tasks if appropriate support is missing or too little time is allotted. The type of task may impact students’ learning (Apedoe, 2005; Reeves & Reeves, 1997). The literature indicates that group interaction may be influenced by the complexity and nature of the task. Some tasks may lend themselves to cooperative learning which uses a task specialization approach where students take divided tasks, and then their results are combined into a final product. Other tasks may lend themselves to collaborative learning that places an emphasis on mutual engagement to reach a common group goal (Bernard et. al., 2000; Kitchen & McDougall, 1999). In this study, the students reported that the groups’ tasks may have created challenges and impacted motivation and interaction to do groupwork. The two groups had different group projects. The task in Group One did not require much group interaction, but the task in Group

Two required the group members' interaction as the parts that the group member worked on individually were interconnected.

In this study, students in Group One cooperated to complete their task, while students in Group Two collaborated to produce their group product. Gregory in Group One described an example of cooperation: "We kinda divided it up so we were each doing our own tasks to contribute to the group project . . . We could each work kinda independently and then put it together in the end." However, Brad in Group Two related an example of collaboration: "The real collaboration came from the larger project, the E Book project and in that we had to be focused and communicating on what each other was doing because our parts were all interconnected. . . . So, I think that project really required collaboration and it truly was a group effort."

As a result of their different online groupwork processes (cooperative or collaborative), the two groups perceived different levels of learning. When Audrey and Jennifer in Group One were asked, "Did you learn through group work?" Audrey did not consider her task as collaborative work. Instead, she explained, "We just divided up the work load and did it ourselves and meshed together at the end. Jennifer said, "The groupwork teaches you 'Okay, pull your weight', you're hoping everybody else does their stuff..... but I don't think I learned any less or any more based on the group work. I think it was equal." In contrast, the three students in Group Two agreed that they learned through groupwork. For example, when Julia was asked, "Did you learn through group work?" she answered "Yes, you learn because other people are sharing their ideas, experiences, feedback, seeing how people communicate." Marie expressed a similar perspective: "A lot of times we're discussing questions, things that they mention, I might

not have thought of. And so it helps me to kind of round out my ideas and give me, make me more aware of other issues”

Researchers have indicated that task type affects group collaboration (Zhang & Ge, 2006) and group interaction. Different task types constitute a different degree of interdependence and invoke different interaction processes. Woo (2006) showed using authentic tasks in a Web-based learning environment led to meaningful interaction that directly influenced students’ learning. She suggested that designing incrementally more challenging tasks and providing active facilitation are effective strategies for improving the quality of online interaction in a WBLE using authentic tasks. Johnson et al. (2002) suggested that tasks for online group collaboration should have a clear objective and should not be too complex in order to be accomplished without the option of face-to-face communication.

Technology

Technology. The difficulty using technology reported by all the participants in this study is reflected in the literature on online learning. In general, technology has been reported as an important factor affecting students’ perceptions of cooperative learning, social presence, and satisfaction (So, 2006). Online groupwork requires considerable interaction among group members. Yet current Web-based learning environments may not fully support opportunities for social interaction, psychologically or technically (Bonk et al. 2007; Kirschner & Van Bruggen, 2004). Text-based tools may restrict interpersonal communication to the exchange of text-based verbal expression (McDonald & Gibson, 1998). For some learners, the failure to express feelings, opinions, and situations can create significant barriers to communication. Technological challenges (e.g., slow connection speeds, lost connectivity, no audio, unloading HorizonWimba®, and difficulty in using the Whiteboard in HorizonWimba®) may also deter

communication between group members making collaboration difficult. When communication is constrained by the technical apparatus, the collaborative process cannot function at an optimal level (Ragoonaden & Bordeleau, 2000).

In this study, the mode of communication impacted group interaction and group members' sense of connection. For example, the group members in Group One had a strong sense of connection in the synchronous part of the online class, but after the course communication mode changed from synchronous to asynchronous, the group no longer met in a virtual classroom. They only communicated through email, and they reported feeling disconnected from their group members. Group Two, on the other hand, continued to meet at the class time, and they felt a growing sense of community. Gregory stated, "I do think that the fact that when we're meeting in class online [the required meeting], we have more interaction with our group." It appears that the medium may influence the interaction among students.

For successful online groupwork, the instructor needs to help students feel comfortable with the system and with the software that they are using. An orientation on how to use computers and Internet basics is critical for virtual students if they are to have any likelihood of success in online courses (Palloff & Pratt, 2003). In addition, excellent documentation on the effective use of the software (Curtis & Lawson, 2001) and a timely and effective response from the help desk are all essential to "ensure access and the smooth operation of the teaching medium" (Graham, Scarborough, & Goodwin, 1999, p. 39).

Groupwork Process

Accountability. The lack of accountability reported by participants in this study is reflected in the literature on online learning. In this study, lack of accountability included group members' missing online meetings, failing to respond to group member's emails, and delay in

providing feedback. So (2006) found that accountability is a critical factor which impacted student perceptions of collaborative learning. If students do not make a contribution to the group process, this diminishes group satisfaction (Drury, Kay, & Losberg, 2003; Graham, 2002; Graham & Misanchuk, 2004; Slavin, 1995; So, 2006). For example, a member in Group Two stated that he was very disappointed with another group member's lack of individual accountability and had to send her a "pretty strongly worded email, [saying,] 'you really let me down. You didn't send me anything that I can use.'"

To enhance individual accountability, researchers suggested that instructors should use contracts and both formative and summative peer evaluation. A group generated contract outlines the responsibility of group members including communication, norms, decision-making, emergencies, and changes; thus it provides a structuring protocol for groups to use as a guide for their collaborative work (Zhang & Ge, 2006). Likewise, Murphy et al. (2000) also found that using a group contract made free loaders more easily identifiable and made group dynamic problems easier to solve. To further ensure individual accountability, So (2006) recommended that the instructor should use both formative and summative peer evaluation.

Communication. The communication barrier reported by the participants in this study is reflected in the literature on online learning. For example, Kim et al. (2005) found that the difficulty of communication among peers was a major challenge due to the absence of face-to-face contact among the students in online settings. Lack of verbal communication can make online communications very frustrating (Watkins & Corry, 2007). In this study, the participants had difficulty communicating with their group members. Group One reported that the difficulty of communication came from lack of a weekly synchronous group meeting and no response among members; Group Two reported that the difficulty of communication came from group

member's absence of regular group meetings and no response among the group members. In the interviews, Group Two expressed that their difficulty with communication made them take longer to make group decisions than it would have taken had they been meeting face-to-face. Their communication pattern impacted their satisfaction.

To help address students' communication problems, instructors should help students to overcome the difficulties of online communication. Researchers suggested that using a communication protocol and having regular synchronous online meetings would be helpful for improving communication difficulties. These two strategies will be addressed in the section for Research Question Three.

Sense of community. The lack of sense of community reported by some of the participants in this study is reflected in the literature on online learning. For example, Song et al. (2004) and So (2006) found that lack of sense of community was a major challenge among the students in online settings. In this study, a participant in Group One reported she lost a sense of connection as their class communication mode changed from synchronous to asynchronous. At the beginning of the class, Group One had good group dynamics and a strong sense of connection, but their group communication mode and group member's delayed feedback or limited feedback decreased their sense of community and group dynamics. In contrast, Brad and Julia in Group Two were able to build a growing relationship and a strong sense of connection through online collaboration even though they did not know each other in the first face-to-face meeting.

Many scholars have investigated lack of community in online learning (Kim et al. 2005; Song et al. 2004; Hill et al., 2002). According to Gunawardena (1995), the development of a sense of community is the key to promoting collaborative learning. This study shows that the sense of connection among the group members in two groups changed over the course of the

semester. Therefore, the instructor should keep track of students' perceptions related to sense of community and help support students' emotional dynamics (Dirkx & Smith, 2004), and motivate them to keep the sense of connection throughout the semester. There is a need to work with learners to assist them with building familiarity and establishing a community in online groups. Integrating strategies for community building into the design of the course may assist with this effort (e.g., Conrad & Donaldson, 2004).

Feedback. The participants in this study reported that delayed feedback and unclear feedback from peers and the instructor hindered their group decision process and diminished their sense of community. Likewise, in the literature on online learning, a timely response from peers and from the instructor is indicated as important to enhancing interaction (Northrup, 2002) and impacting students' satisfaction with an online course (Steven, Sander, & Naylor, 1996; Vrasidas & Glass, 2002). In the absence of responses, distance learners doubt whether their messages are read and feel a lack of social presence (Rovai, 2000). Participants indicated that the lack of immediate feedback in online classes contributed to the feeling of isolation among students (Vrasidas & Glass, 2002; Vrasidas & McIsaac, 1999). Students' level of participation were affected by their peers (Fung, 2004).

Unclear feedback from the instructor made it difficult for students to understand the instructor's expectations. In the online environment, students and instructors communicate through email without facial expression and gestures, so the students want instructors to elaborate on their instruction and feedback. For example, Gregory reported that "He [the professor] made a comment and just by the way he'd worded it, I couldn't tell exactly what he meant so I had to ask him for clarification and then you have to wait for the response."

In this study, delayed feedback and absence of feedback delayed the group decision making process and exacerbated the lack of connection. For example, Julia in Group Two reported that “I noticed when the group member was absent from class, we had to update her so that therefore it affects the decision that we had to make.” Audrey in Group One complained that “Even when I do get feedback, it’s very short and very limited and you just don’t have a sense of connection at all anymore.” Both of these factors can influence satisfaction with asynchronous communication (Vonderwell, 2003).

The participants in Group Two reported that unclear guidelines for the group project were a challenge that made their groupwork difficult and increased the workload. They had difficulty understanding the instructor’s expectations. According to other scholars, ambiguous instructions on the Web-site as well as via e-mail caused difficulties for students (Hara & Kling, 1999). Cohen (1994) suggested that written instructions for groupwork should be clear and sufficiently detailed for the group to proceed without outside assistance (Cohen, 1994). Instructors should give clear instructions and guidelines regarding online assignments (Palloff and Pratt, 2005).

Peer evaluation. The difficulty with evaluating group members was reported as a challenge by the participants in Group Two. Two group members indicated that their groupwork was unequally distributed. They mentioned that the course did not provide enough guidance for evaluating peers in the group, so it was hard for them to assess other group members’ contributions to the group. The members of Group Two indicated that detailed rubrics and the instructor’s involvement in groupwork process would have been useful. They also indicated that in order to be fairly evaluated, group members needed to also submit individual work. In the literature, the problems of unequal distribution of groupwork among group members are well-documented (Roberts, 2005; 2006).

Other scholars have indicated that instructors need to provide clear guidelines for assessment of collaborative work. For example, Palloff and Pratt (2005) suggest that the use of rubrics may help make the assessment task easier and more objective. Others have suggested that students should be evaluated individually for both their groupwork process and their group product (Robertson & Hewitt, 2006). Results of this study support these suggestions and provide evidence that the group evaluation process may impact students' satisfaction with the learning process.

Time management. Time constraints were also reported as a challenge by the participants in Group Two. Two group members who worked full time had to balance family, work, and course work. In addition, although students valued collaborative activities, they expressed the need for a balance of group work and individual tasks. This balancing act can be difficult and demands a high level of self-discipline by participants in an online class (Carr-Chellman, Dyer, & Breman, 2000). For example, Marie described how difficult it was to get her work done under time constraints: "It was just a lot of little things that we had to get done and it seemed like the time went by so fast. After class, I had five more days to get done all the readings and all that but it went by so fast. You knew that the work was due for the next week." Brad also described a heavy workload due to time management, "It was due to the fact that our work load was a lot higher. We could have been super organized and started in February with our chapter but like most people, we put it off until the deadline and ended up being quite a large amount of time invested. So, we did have some challenges."

Some scholars have also indicated that time management can be a challenge. For example, Palloff and Pratt (2005) suggest that groups need to know up front how much time a collaborative activity will take, and each group member needs to commit to that time. Hill (2002)

and Song et al. (2004) found time management to be a useful skill for success in online learning settings and suggested some strategies for managing time. For example, the students should publicly commit to group projects and should also commit a specific amount of time to working on group projects. Providing learners with an overview of time management strategies should form a part of the orientation for online courses (Palloff & Pratt, 2005).

Research Question Three. What do students say could be done in the learning environment to make their groupwork and collaboration more effective?

This question sought to identify specific strategies for students and instructors that can be implemented to assist students in completing groupwork online based on the factors participants identified as helpful or challenging. Participants in the study suggested various learning and teaching strategies based on their experiences in their online groupwork.

Strategies for Students

The strategies for students included three areas: group formation, communication, and building a sense of connection (see Table 5.1.). Each area is described in more detail below.

Table 5.1. Strategies for Students

Areas	Strategies for students
Group formation	<ul style="list-style-type: none"> • Having a small group • Finding a group based on shared interest • Choosing people that you know and have worked with before
Communication	<ul style="list-style-type: none"> • Checking email every day • Sending frequent emails even if it's something minor • Having a regular synchronous online group meeting • Having a group coordinator • Setting up a group communication protocol
Sense of connection	<ul style="list-style-type: none"> • Attending a face-to-face meeting • Spending time together socially

Group Formation

Having a small group. As mentioned in the discussion of research question one, participants indicated that having a small group helped them to get to know each other more easily for completing online groupwork. In this study, both groups were comprised of three members each. The literature on group size indicates an optimal a range between 3 and 6 members (Johnson & Johnson, 1997; Nelson, 1999; Tu, 2004). While further research is needed, three may be good place to start. The participants suggested that students should have small groups.

Finding a group based on shared interests. As mentioned in the discussion of research question one, having a homogeneous group helped members to build a sense of connection, to communicate better, and to get to know each other more easily in an online environment (Graham & Misanchuk, 2004; Pierrone & Sedlacek, 2000; Tu, 2004). The participants suggested that students should find a group based on shared educational interests and similar background. In this study, the participants in Group One were all K-12 teachers and those in Group Two were mixed in terms of interest. Interestingly, Group One indicated a greater sense of connection than Group Two. More exploration is needed, but the suggestion for homogeneous groups worked well in this class.

Choosing people that you know and have worked with before. In this study, having worked together in a previous class seemed to be helpful. In Group One, the prior experiences of working together helped the groupwork process to proceed more smoothly and helped the group members to know what to expect from each other. The literature suggests that the stage of the group, whether it is in an early or a mature stage, impacts group communication, process, and product (Carabajal et al., 2003; Pavitt & Johnson, 1999). Online groups in early stages send

messages that focus on learning about each other and coming to trust each other (Olson & Olson, 1997) while mature groups send messages that contain a higher percentage of group work (Carabajal et al, 2003; Wheelan & Kaeser, 1997). Mature groups that share history are more coherent, so group dynamics grow stronger. Getting to know each other helps students to build a sense of connection easily.

Communication

Checking email every day and sending frequent emails even if it is for something minor.

In this study, four students in two groups addressed the importance of communication among group members. They suggested that students should go to the website for the class everyday and that they should keep sending out many emails even if it is for something small. This helped group members to stay on the same page in the group project and also to stay connected with their group members. According to research by Hill et al. (2002), a daily visit to the course Web-site to check new messages helped build a sense of connection. Encouraging students to check the Web-site daily is one strategy an instructor can adopt that will help facilitate online groupwork.

Having a regular synchronous online group meeting. Results of this study indicated that the members of Group One had difficulty communicating with each other during the asynchronous portion of the course. In Group One, a synchronous group meeting helped students to make decisions quickly and to connect with group members. According to the literature, synchronous communication “increases interaction between course participants, supporting collaborative learning, and fostering social interactions between individuals” (Dede, Whitehouse, & L’Bahy, 2002, p.13). Group members need to set up regular online meetings to build sense of community and to maintain good work habits. Asking group members to establish a regular

communication pattern from the beginning can help establish a routine that will facilitate effective group communication (Bonk, Lee, Liu, & Su, 2007).

Having a group coordinator. As mentioned in the discussion of research question one, a group coordinator's leadership helped the group process run smoothly. In this study, Group One shared the group leader role while Group Two had a group coordinator. In the final interview, one group member in Group One reported that it took longer to reach consensus because they shared group leadership, "I think that everybody is kind of used to taking the leader position, and so a lot of times we were all making suggestions like we were trying to make all these decisions." Group Two indicated that the group coordinator did a good job as a facilitator and a motivator; he acted as a moderator who facilitated the communication among the group members. Researchers also suggest that groups in online classes should choose a group coordinator (Harasim, Hiltz, Teles, & Turoff, 1995). More exploration is needed concerning the implications of having a shared leadership role and having a group leader, but having a group leader worked very well in this class.

Setting up a group communication protocol. A student in Group One recommended that students should set up a group communication protocol to help smooth the collaboration process. Some researchers recommend that groups should establish expectations and norms early in the process (Fung, 2004; Johnson et al., 2002; Kitchen & McDougall, 1999; Ragoonaden & Bordeleau, 2000). Communication problems may be solved by providing group process rules (protocols or standards) at the beginning of a project (Chinowsky & Rojas, 2003). Examples of group process rules include expecting a reply within 24 hours, sending e-mail outside the course system to let others know about challenges, and using the telephone to report problems. These

strategies can assist in creating group norms and standards and can help to overcome the difficulties of online communication, thereby proving useful for the individual and the team.

Attending a face-to-face meeting. This study found that an initial face-to-face meeting was very useful to build a sense of connection and to provide information about the course. The literature indicates that a face-to-face meeting can help establish a sense of community and facilitates active participation (Gabriel, 2004; Hill, 2002; Schrum & Hong, 2002). Further, a face-to-face meeting at the initial orientation establishes a sense of group cohesion that makes social presence in their group online learning environment easier to establish (Stacey, 1999). Such a meeting also provides the opportunity to “socialize and start or continue development as a community of learners” (Tallman & Fitzgerald, 2005, p. 27). These are important elements in establishing a sense of community among online learners. Hill et al. (2002) recommend giving learners sufficient opportunities to interact with each other as well as with the instructor. One way to do this is having face-to-face meetings.

Spending time together socially. Getting to know each other helped group members in Group Two know how they worked together. They spent time together socially online as well as working together online, and participants indicated that this worked very well. It is important to get a sense of connection among group members. To promote a sense of connection, an online instructor should provide numerous opportunities for learners to know and trust one another. As a result, learners may gradually turn into a community of learners.

The encouragement of more social interactions could help to overcome the students’ lack of familiarity with each other. Zhang and Ge (2006) suggested using an informal online break for an online team meeting when all parties can share casual conversation and social jokes in order

to encourage members to greet each other in a positive way. While the strategy was not implemented in this course, it may be an area of exploration for further research.

Strategies for Instructors

The strategies for the instructor include two areas: design and process (see Table 5.2.).

Each will be explored in more detail in the following the sections.

Table 5.2. Strategies for Instructors

Categories	Sub-categories	Strategies for Instructors
Course Design	Designing for facilitating interaction	<ul style="list-style-type: none"> • Providing multiple communication methods for groups • Having a mandatory weekly group activity during the asynchronous portion of class
	Providing an overall plan for the class	<ul style="list-style-type: none"> • Providing a specific deadline, checklists, rubrics, and examples. • Giving plenty of clear benchmarks about where students should be at certain points in the semester. • Posting weekly announcement
	Preparing for technology	<ul style="list-style-type: none"> • Setting up a WebCT course in advance before the first class started
Process	Helping Group formation	<ul style="list-style-type: none"> • Providing group formation guidelines • Limiting group size • Helping students a find a group
	Building sense of connection	<ul style="list-style-type: none"> • Having a face-to-face meeting • Providing a time for group members to learn each others' background and skills
	Building virtual team skills	<ul style="list-style-type: none"> • Having students knowing how to use communication tools. • Address groupwork process , strategies, and characteristics of groupwork
	Being involving in group process	<ul style="list-style-type: none"> • Checking if they were on track • Monitoring their groupwork process • Check to see if there is any problem
	Evaluating the process	<ul style="list-style-type: none"> • Being more involved in group evaluation. • Providing a group evaluation rubric or checklist for group evaluation. • Having students submit individual work samples. • Assigning a group meeting time, attend their group meeting, and evaluate each group member.

Designing for facilitating interaction

Providing multiple communication methods. This study also found that multiple communication methods were helpful to Group One. The multiple communication mode provided flexibility and convenience. Hill et al. (2002) found that multiple communication technologies (bulletin board, chat, email, phone) worked well and were important for facilitating interaction, enabling learners to have sufficient opportunities to interact with each other as well as with the instructor. Use of multiple modes of communication assists active participation, group-focused activity, and interaction among learners (Han & Hill, 2007).

Providing mandatory activities during the asynchronous portion. As mentioned in the recommendations for students, the participants suggested that the instructor should require mandatory classroom activities such as having the students attend a group meeting and participate in discussion in order to facilitate group interaction and collaboration. In this study, mandatory activities such as providing and getting feedback on their individual lesson plans helped students in Group One to promote group interaction. The literature suggests that group interaction can be promoted by instructional techniques. For example, Driver (2002) suggested that instructors might consider experimenting with instructional techniques that are designed to facilitate regular small group interaction above and beyond scheduled class meeting times through web-enhanced communications and structured online group assignments. Krejin et al. (2004) also recommended that instructor's strategies impact both social presence and social interaction. Through facilitating and reinforcing social interaction, students' collaboration may be improved (Krejin et al, 2004). Mandatory activities may promote group interaction among group members, which helps students to complete their groupwork.

Providing overall plan for the class

The results of this study indicate that the online instructor played an important role in offering guidance in the online learning environment. Palloff and Pratt (2005) mentioned that “when it comes to collaborative activity, letting students know in advance how the instructor intended to be involved with the process and how he or she planned to guide them gave them the sense of confidence they need to move forward” (p. 23). As the students did not meet the instructor regularly, they needed to have an overall plan for the class that included information such as when projects were due, rubrics, and examples. In this study, the instructor provided a specific deadline, checklists, rubrics, and examples for weekly groupwork.

Conrad and Donaldson (2004) describe a rubric as a tool that “defines the performance levels for each gradable activity element” (p.26). If rubrics are linked to course expectations and students are directed to use them for assessment of themselves and their peers, students will end the course with a clear picture of their performance (Palloff and Pratt, 2005).

In this study, the instructor provided a list of what students in a group should complete each week on the main page of class web-page. The weekly announcement helped the students to figure out what they should do, and enabled them to prepare their assignment and weekly group activities on time. Hill et al. (2002) suggested that posting of announcements helps students to enhance communication during the class and create opportunities for connections by and between learners. These connections can support learning outcomes.

Preparing for the technology

Setting up the WebCT course in advance. This study found that setting up the WebCT course in advance was useful for the students as it enabled them to get some information on the course and on the students ahead of time. It even allowed the members of Group One to form a group before the first face-to-face meeting. This finding was similar to that reported by Conrad

(2002) in which students engaged in an online graduate course wanted access to course web-sites a week or so before the official start date. Learners want a relaxed and manageable amount of time to preview the course and to determine that they can obtain all of the necessary information (Conrad, 2002). Therefore it is useful for the instructor to provide access to the online class early

Helping group formation

Providing group formation guidelines and limiting group size. As mentioned in the discussion on strategies for students in research question three, participants indicated that the instructor's group formation guidelines, including limiting group size and having a shared educational interest area, helped them to form a group. The participants suggested that instructors should provide group formation guidelines including group size and educational interest area, and limit students to small group. Other researchers have provided guidance in this area that may be worth further exploration (Graham & Misanchuk, 2004; Tu, 2004).

Helping students to find a group. In this study, students selected their group based on their shared educational interests or chose group members that they knew and had worked with before. Their shared interest and knowing each other helped them to do groupwork well. Nonetheless, participants in this study did report that finding a group had been a challenge in their previous experience. When distance learners, first time online learners, or students who do not know each other need to find a group at the first class meeting, it is hard for them. Jennifer in Group One suggested that the instructor should assign students to a group, "Here is your group." If students do not find a group, the instructor's assistance in finding a group based on their interest will be helpful.

Building sense of connection

Having a face-to-face meeting. In this study, participants reported that an initial face-to-face meeting during the course established a sense of community and thus facilitated active participation. Students need to have a chance to know their classmates' background and skills before forming a group in order to do groupwork. The initial face-to-face meeting was helpful. The instructor should provide a face-to-face meeting and should give students enough time to talk about their background and skills.

However, in a distance course, many students who are full time employees and live in different areas cannot attend meetings. If face-to-face meetings are unavailable, initial contacts can be made through the online learning environment, which is capable of conveying both verbal and non verbal communication cues as well as social presence (Kitchen & McDougall, 1999; Zhang & Ge, 2006).

Providing a time for group members to learn each others' background and skills. In this study, Julia perceived the lack of information about her group member's skills and backgrounds as her biggest challenge because she met her group members only once. To help students to form their groups, the instructor should have give students enough time to get to know each other. Two members in Group Two suggested that the instructor should give students enough time to talk about their background and skills and spend the time together socially. Han and Hill (2007) suggested that encouraging students to share their backgrounds and experiences formally and informally promotes the development of social presence. This, in turn, may help make the group experience more rewarding.

Building virtual team skills

This study found that technological challenges impacted students' perception and interaction. If students have a technical problem, providing adequate technical support for their learning is an important first step in effective Web-based learning (Carr-Chellman et al., 2000; Gabriel, 2004). Audrey in Group One mentioned that the technology orientation was useful. She suggested that instructors should provide a technology orientation. The literature also indicates that an orientation on how to use computers and Internet basics is critical for virtual students if they are to have any likelihood of success in online courses (Palloff & Pratt, 2003).

Online collaborative groupwork requires students to develop specific skills. Many researchers suggest that it is important to develop virtual team skills (Gabriel, 2004; Graham, 2002; Graham & Misanchuk, 2004; Taylor, 2005). These include good communication skills, decision-making skills, social skills, and teamwork skills, as well as the ability to adapt and trust. Helping to facilitate the development of these skills may be useful for groupwork online.

Being involved in the group process

In this study, students in both groups mentioned that they needed the instructor to provide prompt and detailed feedback. They also needed the instructor's support and wanted to know if they were on track. The instructor can be involved in the students' groupwork process by monitoring the groupwork, evaluating each group member, and checking to see if there are any problems. In the literature, the online instructor needs to "intervene in case of over- and under participation to minimize frustration and conflict" (Palloff & Pratt, 2005, p.40). The instructors should make use of specific interventions that help the group become more aware of the fundamental issues and how these issues may shape and influence the ways they work together.

It should be noted that the instructor's intervention in online groupwork can impact students' perception positively or negatively. Kitchen and McDougall (1999) found that some

students appreciated the instructor's involvement and occasional contribution to the group while others felt quite negative about the notion of being under constant evaluation. Therefore it is important that the instructor should provide an "appropriate amount of guidance to assist group work" (p. 255). The instructor may also support students' group dynamics in order to develop the authority and interdependence necessary for effective collaboration online. Instructors need to structure and facilitate collaborative learning online by intervening when students have difficulties with emotional issues or project issues or when they need some help (Dirkx & Smith, 2004).

Evaluating group process

As mentioned in the discussion of research question two, difficulty with evaluating group members was one of challenges for Group Two. In the interviews, two group members reported one group member's lack of accountability and an inequitable distribution work. To enhance accountability, participants suggested that the instructor should be involved in students' group evaluation process, provide more detailed peer evaluation rubrics and samples, and have students submit individual work samples. The instructor should assign a group meeting time, attend their group meeting, and evaluate each group member.

The literature indicates the importance of peer evaluation among group members. For peer assessment to work well, it is important for the instructor to provide clear and concise guidelines, and for the instructor to maintain the ultimate responsibility for the final grades (Robert, 2006). Instructors should ultimately assess students' groupwork process and product; input from group members may prove beneficial for the instructor and the group.

Implications for Practice

The results of this study can inform educational practice about online learning environments, and, in particular, the facilitation of group interaction and group dynamics. The roles assumed by instructors in online learning environments and in online group situations are important considerations. In this study, participants indicated that the instructor's role should include being a facilitator, motivator, and guide. Instructors should be prepared to design and facilitate the most effective learning experience. Establishing teaching strategies for helping students' online groupwork may prove to be useful as successful collaborative learning does not start automatically (Oliver & Shaw, 2003). The following suggestions are made for online educators interested in facilitating online groupwork.

The first implication is that students in the same group may have different perspectives, different challenges, and different levels of satisfaction with their groupwork. In a group, the sense of connection and the group dynamics may also change over the course of the semester. Though students in a group may have a strong sense of connection at the beginning of the semester, this may diminish depending on their interaction with the other group members. Alternately, while students may not know each other at the beginning of the semester, they may build a growing relationship and a strong sense of community through online collaboration (Conrad & Donaldson, 2004). Online educators would do well to understand individual students' unique experiences and to assist with facilitating group interaction and group dynamics by employing various strategies. Online instructors need to adapt their teaching methods to better support students' groupwork and to maintain a sense of community.

The second implication is that online instructor should provide increasing opportunities for learners to get to know each other and to build trust in another. In this study, knowing their

group members before this study helped the participants to have group confidence and to know what to expect from their group members. Trust may help a group to develop more effectively. Social presence is important for promoting group dynamics and facilitating online groupwork (Garrison & Anderson, 2003; Palloff & Pratt, 2005). To promote a sense of connection, an online instructor should provide numerous opportunities for learners to increase their familiarity with group members and build more trusting relationships. As a result, learners may gradually turn into a community of learners.

The third implication is that previous experience has an impact on online groupwork. Participants reported that their previous experiences with CMC, with online courses, with groupwork in face-to-face settings, and with online groupwork helped them both to prepare for online groupwork and to do online groupwork more easily. Previous experience may enable students to overcome their challenges and to develop their own strategies for approaching both technology and groupwork. Their previous experiences gave them the skills and abilities they needed to be successful when conducting online groupwork. Therefore, instructors should make sure students have suitable entry-level skills for online groupwork (Carr-Chellman et al, 2000). If students do not have appropriate entry-level skills, the instructor should help students to build virtual team skills. One way this might occur is through group formation. The students with little or no online groupwork experience could be put in groups with more knowledgeable peers who have experience with online groupwork. This arrangement could enable the less knowledgeable students to learn from their more capable peers.

The fourth implication is that students benefit from getting to know their group members' skills and backgrounds. Groupwork requires all the members of a group to utilize their skills and abilities in combination with one another. Two members in Group Two who did not work

together their previous class suggested that the instructor should give students enough time to talk about their background and skills and spend the time together socially. Encouraging students to share their backgrounds and experiences formally and informally promotes the development of social presence (Han & Hill, 2007). Therefore, it is important for students to learn each other's backgrounds and skills. Instructors should also understand the students' backgrounds and help them when they have problems.

The fifth implication is that forming a group is an important element for doing groupwork well. An online educator should have students form homogenous groups. This recommendation is based on several factors from the research. First, all participants indicated that the fact that they shared an interest in K-12, were all educators, and had all taught was beneficial for their group formation. Their commonality helped them to get to know each other easily and made them feel more comfortable working together. Based on this positive experience, the participants recommended that students in online classes should find a group based on shared educational interests and similar background. Research indicates that homogeneous groups tend to be more cohesive (Graham & Misanchuk, 2004; Perrone & Sedlacek, 2000) and that homogenous grouping may be more effective for distance learners because it can lessen frustrations and problems.

The sixth implication is also related to group formation: group size. An online educator should have students form small groups. Group size was an important contributing factor for groupwork in this study. In this study, all participants indicated that having a small group helped them to get to know each other easily and to distribute their groupwork among group members equally. In particular, in the synchronous online learning environment, when they participated in several twenty-minute group meetings in the group discussion time in class, they had more

opportunities to interact. In synchronous online group discussion, group size is an important factor for engaging learning (Beatty, 2002). Group size also affects the equality of interaction and the contribution to a shared project. Small groups support building strong group relationships and a sense of community (Han & Hill, 2007). In online courses, having a small group may enable students to communicate and interact with group members easily in a synchronous online learning environment. Through interaction, they may build a sense of connection more easily.

The seventh implication is related to task. This study found that task type and complexity impacted group interaction and group dynamics. In this study, the two groups had different projects, some of which required more work than others. Task was one of the challenges for the two groups in Research Question Two. Group One mentioned that their group project was not collaborative work and did not motivate them to work together. Group Two also expressed that their groupwork was huge and that it was more appropriate for traditional face-to-face work. Researchers recommended that the instructor should provide appropriate task type, and an appropriate level of complexity to encourage effective collaboration without frustration (Johnson et al, 2002; McAlphine, 2000; Zhang & Ge, 2006). Tasks and learning activities were important influences on student motivation and cognition (Pintrich & Schunk, 2002). Therefore, a further consideration is that the instructors of online courses should ensure that the tasks undertaken by each group have the same level of complexity and require an equal amount of work that is equally divided among the group members.

The eighth implication is that multiple opportunities for interaction should be made available to students in online courses. Online groupwork requires significant interaction among group members. The findings of this study reinforced the importance of group interaction. Interaction among Group One declined after the communication mode changed from

synchronous to asynchronous. Some of group members expressed feeling disconnected from their group members. Online educators should ensure their students have sufficient opportunities for interaction by having a weekly online group meeting, posting requirements regarding their weekly reading, and getting and receiving feedback from group members. For example, Driver (2002) suggested that “instructors might consider experimenting with instructional techniques that are designed to facilitate regular small group interaction above and beyond the scheduled class meeting times through web-enhanced communications and structured online group assignments” (p. 43). Mandatory activities may promote group interaction among group members, which helps students to complete their groupwork. The instructor’s pedagogical strategies impact both social presence and social interaction. Through facilitating and reinforcing social interaction, the instructor can improve students’ collaboration (Krejin et al, 2004). Online educators should ensure their students have sufficient opportunities for interaction by having a weekly online group meeting, posting requirements regarding their weekly reading, and getting and receiving feedback from group members.

The ninth implication is that an online educator should intervene in students’ online groupwork. In this study, students in both groups mentioned that they needed the instructor to provide prompt and detailed feedback, they needed the instructor’s support, and they wanted to know if they were on track. The instructor should be involved in students’ groupwork process, should monitor their groupwork process, should evaluate each group member, and should ask if there are any problems. In the literature, the online instructor needs to “intervene in case of over- and under-participation to minimize frustration and conflict” (Palloff & Pratt, 2005, p. 40). Instructors need to structure and facilitate collaborative learning online by intervening when students have difficulties with emotional issues or project issues or when they need some help

(Dirkx & Smith, 2004). The instructor should provide appropriate guidance to assist with groupwork and should make use of specific interventions that help the group become more aware of the fundamental issues and how these issues may shape and influence the ways they work together.

The tenth implication is that an online educator should provide students with detailed guidelines for groupwork projects and for the course. In this study, as the students did not meet the instructor regularly, they needed to have an overall plan for the class that included information such as deadlines, rubrics, and examples. Detailed and clear guidelines help students to understand the objective of the groupwork more easily (Cohen, 1994; Palloff & Pratt, 2005). This is especially important as online learners often have very busy schedules. Five of the six participants were full time workers, so they wanted the instructor to provide specific deadlines, checklists, rubrics, and examples for the group project as they believed this would help them to plan their time more effectively.

The eleventh and final implication is that, given the importance of facilitating groupwork, the design and development of the online learning environment is an important element. Instructional designers should consider ways to facilitate groupwork in an online environment. Instructional designers should also focus on student learning style, group size, task type, communication tools, group composition, and group process development. Strijbos, Martens, and Jochems (2004) suggest that learning objectives, task-type, group size, and computer support should all be designed to promote interaction in computer-supported group-based learning. Group members' satisfaction with group formation depends on group dynamics and is affected by many elements, including entry elements and process elements as shown in the literature section (Carabajal et al., 2003). However, few models regarding the design of effective

groupwork in online environments exist. The challenge that remains is one of examining the current models and processes that exist for face-to-face group work instruction and determining how well they work for online groupwork.

Implications for Future Research

Through this study, three major areas for further research were identified. First, online groupwork requires significant interaction among group members. The online learning environment's major benefits, flexibility and convenience, enabled students to interact with their group members and to complete their groupwork without a face-to-face meeting. In this study, both groups completed their groupwork without a face-to-face group meeting. However, the group members indicated that their technological challenges resulted more from the nature of the online learning environment than from their technical skills. They could not control some problems such as not being able to hear each other from time to time. Nor could they control some of the limitations of the technology such as the fact that the technology allowed only one person to talk at a time. The current Web-based learning environments may not fully support opportunities for social interaction (Bonk et al., 2007; Kreijns & Kirschner, 2004). The participants suggested that the tools should be updated. Therefore, research in online learning environments should further investigate how technology can be improved so that students can work together as they would in a face-to-face setting.

Another important area of research is the identification of conditions that are most supportive of group interaction in an online group. First, the effect of synchronicity in group interaction is still somewhat unknown. In this study, due to a change in the course communication mode (from synchronous to asynchronous), the two groups used different communication modes, which led to different kinds of group interaction. This study showed that

communication mode may impact group interaction, group dynamics, and a sense of community. Lack of synchronicity in Group One made students feel disconnected. Researchers indicate that synchronous communication tools can increase social interaction among students (Dede et al., 2002) and create a sense of connection (Carr-Chellman et al., 2000). There is need for more research on how synchronous and asynchronous communication modes impact group interaction, group dynamics, and sense of community differently.

Second, the effect of group composition is not fully explained. In this study, both of the two groups' compositions were homogeneous. They were teachers, were about the same age, and had previous online class experience. Additionally, five of six participants in the two groups had worked with a group member in a previous class. They already knew each other and had already established confidence in each other. This study did not show how group composition impacted group dynamics and sense of connection. Future research should investigate how group composition factors such as different group sizes, different backgrounds, being a first time online learner, gender composition, and speaking a different language, may impact group dynamics and sense of connection.

Third, the effect of group tasks needs further investigation. In this study, the two groups had different types and scopes of tasks and showed different levels of interaction. The groupwork of Group One was characterized by cooperation, as the students divided the tasks, and then combined their results into a final product. The groupwork of Group Two was characterized by collaboration, as the students worked together to reach a common group goal. This study questioned what type and scope of task are appropriate for online groups because the online learning environment is different from the face-to-face learning environment. Tasks for online learning environments should be designed so that they require collaboration among team

members for learning rather than cooperation. Thus, there is a need to research the effect of task type in an online learning environment. In addition, the tasks in this course appear to have been more academic than authentic, and this may have had a limiting effect on the nature of the interactions about the group members. As other researchers have noted, more authentic, real world tasks may have engaged a different set of behaviors among the group members (Herrington, Reeves, & Oliver, 2006). Future research should focus on how the nature of the task (e.g., more academic or more authentic) affects group interaction in an online learning environment.

Another important area of research is the development of an instructional design model for online groupwork. There is a need for effective instructional design in online courses to better facilitate groupwork. The design should focus on the technological, task, and social dimensions that impact the group development process. Continuing to explore design models that are most effective for online collaborative learning will also help facilitate groupwork.

Summary and Conclusions

In this chapter I addressed my research questions using the findings of this study and making specific references to related literature. I then discussed several implications for practice and research regarding the promoting and sustaining of group interaction, group dynamics, and sense of community in online groups.

The factors of online groupwork that students recognized as being challenging or helpful in the learning process over time were categorized into individual characteristics, group characteristics, technology, course design, students' group process, and instructor's group process. In an input-process-output-dynamics model, all input elements influence group

processes, which in turn affect group member's satisfaction and learning. Figure 5.2. depicts the overall conclusions of this study; each element is explained in more detail below.

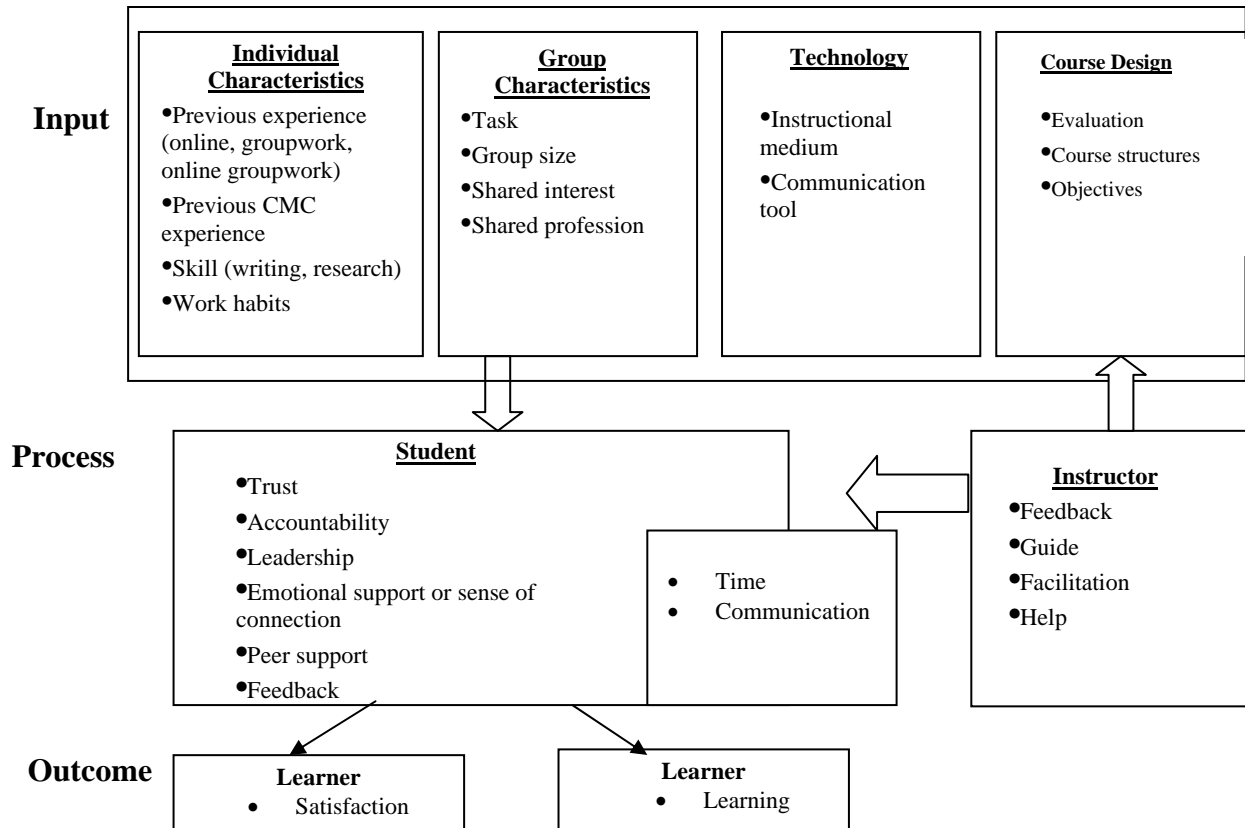


Figure 5.2. The overall conclusions of this study

1. Individual characteristics affect group interaction and group dynamics. Individual characteristics include previous experience (online class, groupwork, and online groupwork), previous CMC experience, shared professional interest, skill, and work habits.
2. Group characteristics also affect group interaction and group dynamics. Factors in the group include group size, task type and scope, and shared interests.
3. Technology impacts group interaction and group dynamics.

4. Course design also affects group interaction, including course structure (an initial face-to-face meeting, weekly online synchronous class or asynchronous class), course objectives, and assessment.
5. In the student process, students also play an important role in their groupwork. Some factors in the groupwork process impact group interaction and group dynamics. These factors include accountability, leadership, feedback, peer support, trust, emotional support, and sense of connection. These factors impact student learning and satisfaction. Time and communication are both affected by other factors
6. As a facilitator, motivator, guide and coordinator, the online instructor plays an important role in offering guidance, feedback, and support in an online learning environment.

Students' perception of online groupwork is a result of interaction among group members or instructors. This study examined the factors of online groupwork that students recognize as being challenging or helpful in the learning process over time. This study suggested critical factors that affect group interactions and offered helpful strategies to promote group interaction for learning. Finally, this research also provided strategies for students and instructors that can assist students in completing their online groupwork successfully. The findings of this study confirm much of the previous research while also offering new insights into the processes of online groupwork by using qualitative research methods with the group as a case. By listening to the voices and examining the perspectives of all the members of small groups, this study contributes to the new, yet growing, literature base on online groupwork.

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APPENDICES

APPENDIX A: Interview Protocol and Guide

Initial Protocol and Guide

1. Begin with the following opening statement

Hi !! My name is Myung-Hwa Koh, a doctoral student in Instructional Technology. I appreciate your willingness to participate in these interviews. I am looking forward to hearing about your experience.

The purpose of this study is to investigate your experiences in online group work. My intention is to explore groupwork from the group members' perspectives and to discover strategies that can be implemented to assist students in completing online group work.

I will ask you some questions about online groupwork, step by step. I will record the interview with our questions and answers.

[Do you have any questions?]

2. Remind the participants that you will be tape-recording the interview; that all responses will remain confidential; and that they have the right to terminate the interview at any time.

Before we begin, let me assure you that any information you provide will be kept strictly confidential. In the final research study I will disguise your identity by utilizing a fake name (or by only presenting aggregate data). Do you have a name you would like me to use? The tape recording of the interviews will be destroyed three years after the completion of the study. Your participation in providing me with information on your groupwork experiences in an online course is completely voluntary and you may discontinue our interaction at any time or skip any question you don't want to answer.

3. Turn on the tape recorder and begin the interview. Follow the interview guide, but remain open to emerging topics. Take fieldnotes and probe throughout.
4. Close the interview by thanking the participant and turning off the tape recorder.

Semi-Structured Interview Guide for Monthly Interviews

1. Think about a time during the past month when you participated in your groupwork. Could tell me about your groupwork experiences in groupwork in the online course? Describe it for me.
2. What is good about your collaboration with group members?
3. What challenges have you faced in your collaboration during the past month?
4. Could you give me your examples of challenges you have encountered in your collaboration with group members?
 - Group Forming
 - Social dynamics
 - Group size
 - Roles played in group – collaboration
 - Group decision process
 - Group Project (Task)
 - Workload (Time)
 - Time management
 - Accountability
 - Teamwork
 - Working environment
 - Technology
 - Learning styles
 - Culture
 - Language
5. Can you tell me about your sense of connection with group members?
 - Social Interaction with group members
 - Feeling with group members
 - Communication
 - Social presence
6. Can you tell me about your collaboration with group members? Can you tell me about how your group communicates?

7. What suggestions would you make to a student working in group work based on your experiences during the past month?

8. What suggestions would you give to an instructor on how to facilitate student group work?

Semi-Structured Interview Guide for Focus Group Interviews

1. What factors do you think affect student interaction?
2. What affects group dynamics?
3. What makes you satisfied with your experience doing groupwork?
4. What challenges have you faced in doing student groupwork? Could you tell me about your experiences?
5. What has been good about your collaboration with group members?

Final Interview Questions

Pseudonym:

Interviewer:

Time of Interview:

Gender:

Major:

Role:

The number of group members:

[Background Question]

How many web-based courses have you completed?

Have you experienced online group work before taking this online course?

- 1 Reflect back on your participation in a group project and working with your group members this past semester. Tell me about your groupwork process and your role.
- 2 What was good about your collaboration with group members?
- 3 What challenges did you face in your groupwork?
- 4 Can you tell me about your sense of connection with others in your group?
- 5 Can you tell me about your collaborations with group members?
- 6 Can you tell me about how your group communicated?
- 7 Do you think you learned through the groupwork? Why or why not?
- 8 What suggestion would you give to create a better working environment in your group?
- 9 What suggestions would you give to an instructor on how to facilitate student groupwork?
- 10 What suggestions would you give to a student who is taking a group project course for the first time?

APPENDIX B: Online Course Syllabus

Course URL	http://it.coe.uga.edu/~morey/edit6400/
Course Name	EDIT 6400 Emerging Perspectives on Learning, Teaching, and Technology
Course Description	This course will cover theoretical and research foundations of emerging perspectives on learning, teaching, and human performance, with an emphasis on the ways technological environments can be designed to support these areas. Students in this class will conduct comprehensive readings of relevant literature, examine and critique representative learning technologies, give two in class presentations and moderate a class discussion dealing with a current theoretical or research issue associated with learning or performance support, and complete two papers that is either a substantive literature review or is a high level design of an instructional problem where one of the models discussed in class is applied. The instructional problem may be a training or classroom problem. If you want a problem to work, one will be supplied. The linking of theory-to-practice and practice-to-theory will be a major theme of this course.
Objectives	<ol style="list-style-type: none"> 1. Explore the foundations and assumptions of technology-enhanced approaches to learning, teaching, and human performance. 2. Critically examine the literature on emerging applications of technology. 3. Articulate principled technological approaches with the potential to address current educational problems and/or to substantively enhance learning, teaching, and human performance.
Required Reading	Orey, M. (Ed.). (2001). Emerging perspectives on learning, teaching and technology [On-line] Available: http://www.coe.uga.edu/epltt/

Required Technology

Web access through any online provider (though AOL seems to have some problems). A good headset with wrap around microphone designed for use on a computer (purchased in the computer section of your favorite store (Circuit City, Best Buys, and any computer supplier ought to work).

Special Needs Statement

Students requiring special consideration because of some disability are encouraged to contact the course instructor at his or her earliest convenience.

Class Schedule

Jan-9	Face-to-face Orientation in Athens
Jan-16	Online Orientation, Information Processing, Behaviorism and Piaget
Jan-13	Vygotsky, Situated Cognition, Social Constructivism
Jan-30	Motivation
Feb-6	Cognitive Apprenticeships
Feb-13	Scaffolding, Modeling, Articulation and Reflection
Feb-20	Problem-based Instruction
Feb-27	Constructionism, Learning by Design, Project-based Education
Mar-6	Cooperative Learning
Mar-13	Spring Break
Mar-20	Resource-Based Learning OR Adult Learning/Bloom
Mar-27	Multiple Intelligences and Learning Styles OR Experiential Learning
Apr-3	Creativity/Bloom OR Conceptual Change OR Transformative Learning
Apr-10	Reciprocal Teaching OR Computer-Mediated Instruction
Apr-17	Reading Recovery OR Cognitive Tools OR Learning Communities
Apr-24	I-Search OR Six C's of Motivation OR Affective Domain
May-6	All Work is Due

Due Dates

Every week except the night that we discuss each other's lesson plans you must read the assignment, take the self-assessment, create the PowerPoint file, upload the file, and attend class. Besides these weekly assignments, here are the other due dates:

Date	
January-30-2007	Group ebook improvement ideas. This will allow me to give you formative feedback.

April-3-2007	Lesson plans, literature reviews, and chapters need to be uploaded into the WebCT® bulletin board. From this day until class on 6-Nov, you can critique the lesson plans or literature reviews of your fellow group members. You must provide that critique in the context of the rubric. This is called Draft #1. Draft #1 is defined to be the best possible work you can do independently to create this document. It must be complete with nothing that you plan to add later.
April-10-2007	All peer feedback must be completed by this date. This then gives the authors a week to work on revisions before Draft #2 is then submitted for a grade. Click here for guidelines on giving feedback.
April-17-2007	Lesson plan, literature review, and chapters must be submitted to me in WebCT®. This will count 40% of your final lesson plan/literature review grade. This is called Draft #2. This ought to be the best work that you can possibly do after having received detailed feedback from your peers. The “draft” must be complete with nothing left to fill in later. AND All groups must have their ebook improvement first prototype critiqued by me by this date. Some people may be done by now, but I should see the design before building it and I need to have seen the design by now.
May-4-2007	All final lesson plans, literature reviews or new book chapters are due. Use WebCT for this function and send it as a word document. These drafts ought to be complete and all issues raised in your feedback on Draft #2 must be resolved. All ebook improvements must be turned in by this date. Interactive modules will need to include the playable and editable versions of these.

Evaluation

e-Book Improvements	100
Lesson Plan/Literature Review (Draft 100 points) See Lesson Rubric or Literature Review Rubric (100 or 150 Points) or Book Chapter (you must satisfy the instructor and make sure that your chapter conforms to the other existing chapters in the ebook. The ebook improvement grade is also factored into this grade for book chapters)	250
Class Attendance/ Participation/ PPT Slides/ Readings/ Videos	140
Self-assessments	140
Total	630

Group Work

- You will need to form a group on the first night of class. The group should have no more than 3 people. This group will be used for three aspects of the class.
- Your group will create some instructional figures, video, or interactive elements for the ebook.
- Your group will go to break out rooms to discuss theory applications each week in the live classroom.
- During the OR topics in the syllabus, your group will discuss theories in the Bulletin Board in WebCT.
- Your group will provide you with constructive feedback on your lesson plan before I grade it.
- Everyone in your group must be following the same curriculum. Currently, there are three choices,
 - Business and Industry/Higher Education (Adult Education Focus)
 - K-12 with a focus on Language Arts/School Library
 - K-12 without a Language Arts Focus

Here are the topics for each:

B&I/HigherEd	K-12 Language	Non Language
Cooperative Learning	Cooperative Learning	Cooperative Learning
Adult Learning/Bloom	Resource based Learning	Resource based Learning
Experiential Learning	Multiple Intelligence	Multiple Intelligence
Transformative Learning	Creativity/Bloom	Conceptual Change
Computer-Mediated Instruction	Reciprocal Teaching	Computer-Mediated Instruction
Learning Communities	Reading Recovery	Cognitive Tools
Affective Domain	I-Search	Six C's of Motivation

Also, there are two ways to do the work for this class.

- One is the traditional way which is what is described through this syllabus. You create a lesson plan or literature review as an individual and you create an ebook improvement as a group.
- Another way to fulfill the requirements of this class is to write a chapter for the book. However, there are no chapters that I see as necessary to add. Alternatively, you might consider a complete revision to an existing chapter. This way of fulfilling the course requirements counts for both the ebook improvement and the lesson plan and can be done as a group or as an individual.

Finally, your group is free to use the bulletin board, chat room, HorizonWimba break out room, face-to-face meetings, emails, and phone calls for your group work.

e-Book Improvements

This is one of the major assignments for this class. The basic idea is that the book used in this class is free and we as a community of learners ought to work to make it better. Whatever contribution you make, you will be given credit for it. Possible contributions might be adding images to an existing chapter, create a video depicting the theory in action (I will help you put it on our QuickTime Server), creating an animation to help explain a difficult concept, adding additional narrative to an existing chapter, rewriting a chapter, writing a chapter, or some other idea that is approved by the instructor.

Anyone who is included in the video, must sign a talent release form. All signed forms ought to be returned to me. Here is a list of things that have been done in the past and the general purpose of each:

1. Images attempt to either bring many ideas together or provide a conceptual model for the theory.
2. Animations tend to provide a conceptual understanding of the theory
3. Videos usually show the theory in action.
4. PPT Narrations usually are used to summarize the theory, but at least one of them was used more like #3, an embodiment of Learning Communities as depicted in the SLM program.
5. Interactive modules give the reader an opportunity to be actively engaged in some aspect of the theory or as in the Multiple Intelligences chapter, a self-assessment.
6. There are also a few interactive PPT files out there as well that have implemented PPT games.
7. I do need quizzes for all the new chapters this semester.

Everyone in the group must evaluate each individual's (including their own) contribution to this project. Anyone that is not doing their share of the work ought to be brought to the instructor. This individual will be removed from the team and asked to do an individual ebook improvement. Notification of inadequate participation must be made by the midpoint in the semester.

This is one of the major assignments for this class. The basic idea is that the book used in this class is free and we as a community of learners ought to work to make it better. Whatever contribution you make, you will be given credit for it. Possible contributions might be adding images to an existing chapter, create a video depicting the theory in action (I will help you put it on our Quicktime Server), creating an animation to help explain a difficult concept, adding additional narrative to an existing chapter, rewriting a chapter, writing a chapter, or some other idea that is approved by the instructor.

Your ebook improvement project must be given to me in three separate states.

- 1 Design Sketch
- 2 Design Draft
- 3 Final Deliverable

APPENDIX C: Participant Consent Form

Participant Consent Form

I, _____, agree to take part in a research study titled “Student Perceptions of Group Work in an Online Course,” which is being conducted by Myung-Hwa Koh of the Educational Psychology and Instructional Technology Department at the University of Georgia (706-389-6473) under the direction of Dr. Janette Hill of the Instructional Technology Department at UGA (706-542-4035). I do not have to take part in this study; I can stop taking part at any time without giving any reason, and without penalty. I can ask to have information related to me removed from the research records or destroyed.

1. The purpose of this study is to investigate how students interact with group members in a small group through online learning. Specifically, the study seeks to explore the factors of online groupwork that learners recognize as helpful and challenging, based on the courses they are taking.
2. This study will provide valuable information for instructors on how to promote successful online group work and for learners on how to collaborate with other online group members and to become successful online group workers. With the feedback from the participants as learners, on-line instructional designers/instructors will be able to make improvements in designing group work project courses.
3. If I participate in this study, I agree to complete a background survey and participate in an interview once a month, face-to-face or via email. The face-to-face interview will take approximately 30 minutes. I will agree to participate in a focus group interview with my group members that will take approximately 60 minutes, face-to-face or online. The individual interview and focus group interview will be audio recorded. Finally, I will participate in observations that will occur online or face-to-face. I understand that the researcher will make observations in a face-to-face setting or in online 2-3 times each month for 16 weeks.
4. There is no discomfort or stress anticipated during this research. Participation does not entail any risks. Participants may skip questions they feel uncomfortable answering.
5. Individual interview and focus group interview recordings will be labeled by numbers and kept confidential. Pseudonyms will be used for the purpose of transcription and data analysis. The recordings will be erased three years after the completion of the study (December, 2011).
6. The researcher will answer any further questions about the research now or during the course of the project and can be reached by telephone at 706-389-6473.
7. After completing the final interview, the researcher will give each participant a \$20 gift card for Borders.

I understand that I am agreeing by my signature on this form to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

Name of Researcher
Telephone: _____
Email: _____

Signature

Date

Name of Participant

Signature

Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu.

APPENDIX D: Background Survey

Groupwork in Online Learning Environment

Background Questionnaire

Name: _____ E-mail: _____

Please select the most appropriate response for the following questions.

1. What is your gender?

Female

Male

2. What is your age?

18-25

26-35

36-45

Above 45

3. What is your predominant ethnic background?

Caucasian

African-American

Latino

Asian/Pacific Islander

Other (please specify): _____

4. What is your school/work status? (Please check all that apply)

Full time student Part time student

Full time worker Part time worker

Other (please specify): _____

5. What is your major area of study?

Instructional Design and Development (M.Ed.)

Instructional Technology (Ph.D.)

School Library Media (M.Ed.)

Other (please specify program and degree level): _____

6. What year are you in your program?

First

Second

Third

Other (please specify): _____

7. Please indicate your perceived level of subject matter expertise for this class.

- Novice
- Intermediate
- Expert

8. Please indicate your perceived level of overall computer expertise.

- Novice
- Intermediate
- Expert

9. Please indicate your perceived level of expertise in using online communication tools (e-mail, listservs, bulletin boards, chat rooms).

- Novice
- Intermediate
- Expert

10. How many online courses have you taken so far in your **academic career** (this degree program or another)? Please circle the number.

0 1 2 3 4 5 6 7 8 9 10 more than 10

11. Have you ever experienced groupwork (working with 2 or more other people to accomplish a task or activity)?

- Yes No

12. If you responded yes to question 11, where did you experience your groupwork? Check all that apply.

- Work place School Other (please specify): _____

13. If you responded yes to question 11, have you ever experienced **online** groupwork?

- Yes No

14. If you responded yes to question 13, how was your online groupwork completed? Check all that apply.

- Work place School Other (please specify): _____

Thank you for your time!

Appendix E. Observation Protocol and Guide

Observation Protocol and Guide

Date : _____

Participants: _____

Observation length: _____

Observation type: Face-to-face () Online ()

1. <i>Setting</i> : What is the environment? What is the context? What objects, resources, technologies in the setting?
2. <i>Participants</i> : Describe who is in the online meeting, how many people, and their role. What are the relevant characteristics of the participants?
3. <i>Activities and interactions</i> : What is going on? Is there a definable sequence of activities? How do the people interact with the activity and with one another? How are people and activities “connected or interrelated”—either from the participants’ point of view or from the researcher’s perspectives? When did activity begin? How long does it last?
4. <i>Conversations</i> : What is the content of conversations in this setting? Who speaks to whom? Who listens? Quote directly, paraphrase and summarize conversations. If possible, use chat log to back up your notetaking. Note silences and non-verbal behaviors that add meaning to the exchange.
5. <i>Subtle factors</i> Less obvious but perhaps as important as the observation
6. <i>My behaviors</i> : How is your role? What do you say and do? In addition, what thoughts are you having about what is going on?

First Observation

1. How easily do students find a group?
2. How easily do students form a group?
3. What factors do student recognized as challenges at the beginning of the semester?

Second and Third Observation

1. How well do students interact with other students in a group?
2. How has their relationship with group members changed?
3. How well do they collaborate?
4. What are the group dynamics?
5. How well do they do groupwork and discuss relevant concerns, issues, and ideas?
6. What factors do they recognize as challenges?

Final Observation

1. How well do students interact with other students in the group?
2. How has their relationship with group members changed?
3. How well do they complete their groupwork?
4. What are the group dynamics?
5. How do they feel about their group members and their work?
6. What factors challenged them in groupwork at the end of the semester?

APPENDIX F: Individual Interview Summary Sample

Interview questions	Data	Codes	Sub-category	Category
Challenges	<p>MYUNG-HWA: What challenges have you faced in your collaboration with your group during the past month?</p> <p>Julia _II: Well, I know I've missed one class but prior to that, I think one of our group members has missed a class because of family situations so that has kind of been an issue because when we are not in class we don't discuss because she's not in the chat room. And the other issue is we're not chatting beyond class. So, we get to a good point but it's seven more days before we discuss it. And I think we probably need something maybe in between or we need some sort of set deadlines because I am starting to feel some pressure to get these things done and maybe I need more feedback than what my other group members may need.</p> <p>MH: So, you need more communication?</p> <p>J Julia _II: For me, I think so. Yeah. But you know, I think I work differently than the other two people. And also, because I am not carrying a full time job, I think I focus on things probably a longer time span than most people.</p>	<p>Group members missed a class</p> <p>Difficulty with communication with group members</p> <p>Need feedback</p> <p>Different situation (not full-time worker)</p>	<p>Group process</p> <p>Group process</p> <p>Individual characteristics</p>	<p>Challenging</p>
Sense of connection	<p>MH: Can you tell me about your sense of connection with your group members?</p> <p>Julia _II: Well, I think we just kind of work well. We all seem to have a good sense of humor. Other than that, as I mentioned last time, probably the teaching connections.</p> <p>MH: Did you identify your group members with some student background?</p> <p>Julia _II: Well, initially it was just sort of what they were going to focus on because they, obviously, Brad and Marie know each other from previous classes and so I was sort of looking at what their focus would be. I knew they were teachers and so initially when I joined our group.</p>	<p>Sense of connection</p> <p>Shared Profession</p> <p>Shared interest</p>	<p>Process</p> <p>Group characteristics</p> <p>Group characteristics</p>	<p>helpful</p>

Appendix G. Code List


Categories	Sub-categories	Code	Definition
Helpful	Individual Characteristics	Previous Experience	<ul style="list-style-type: none"> • Participating in general online class • Participating in group work in face-to-face setting • Participating in group work in an online learning environment
		Previous CMC Experience	<ul style="list-style-type: none"> • Being comfort in technology
		Work habits	<ul style="list-style-type: none"> • Self-disciplined to take an equal responsibility among group members
	Group Characteristics	Group size	<ul style="list-style-type: none"> • Having a small group
		Shared interest	<ul style="list-style-type: none"> • Having common interest in K-12 system
		Shared profession	<ul style="list-style-type: none"> • Having common teaching experience in K-12 system
	Technology	Nature of online learning	<ul style="list-style-type: none"> • Flexibility & convenience in communication tool • Flexibility & convenience in instructional tool
	Course Design	Course structure	<ul style="list-style-type: none"> • Offering face to face meeting at the beginning • Providing multiple communication methods
	Groupwork Process	Trust	<ul style="list-style-type: none"> • Having high group confidence
		Equal Participation	<ul style="list-style-type: none"> • Being responsive to each other • Being disciplined to take an equal responsibility among group members.
		Leadership	<ul style="list-style-type: none"> • Being a good moderator and a motivator. • Having a communication skill

		Feedback	<ul style="list-style-type: none"> • Feedback from peers • Feedback from the instructor
		Peer Support	<ul style="list-style-type: none"> • Helping each other • Feedback from peers • Group members' strengths helped other group members' weakness. • Carrying the load
		Sense of connection	<ul style="list-style-type: none"> • Being a real sense of camaraderie • Feeling lucky that we had each other in the group, • Feeling really blessed that we got good group members
		Emotional support	<ul style="list-style-type: none"> • Getting positive emails • Making each other feel good about their contributions
Challenges	Individual Characteristics	Cognitive Skill	<ul style="list-style-type: none"> • Having different level of writing and research skills.
	Group Characteristics	Task type and complexity	<ul style="list-style-type: none"> • Independent study • Individual work • Inappropriate for online groupwork • Traditional classroom formats • Huge projects
	Technology	Use of communication tool	<ul style="list-style-type: none"> • Having difficulty using of HorizonWimba • Unloading HorizonWimba • Losing audio without microphone • Lots of micromanaging
	Groupwork Process	Accountability	<ul style="list-style-type: none"> • Taking an unequal responsibility among group members. • Missing regular group meetings. • Not responding group members' emails. • Providing delayed feedback on groupwork.

			<ul style="list-style-type: none"> • Getting feedback too late. • Getting short and limited answer from group members
		Communication	<ul style="list-style-type: none"> • Having difficulty with understanding their comments • Lack of verbal communication • Not knowing if group members had received email. • Group member's missing a class
		Sense of connection	<ul style="list-style-type: none"> • Feeling disconnected
		Time Management	<ul style="list-style-type: none"> • Having difficulty with managing time • Having difficulty with balancing family, work, and coursework • Having difficulty with balancing between individual work and groupwork.
	Course design	Evaluation	<ul style="list-style-type: none"> • Difficulty with evaluating group members
Suggested Strategy for students		Group formation	<ul style="list-style-type: none"> • Having a small group. • Finding a group based on shared interest. • Choosing people that you know and have worked with before.
		Communication	<ul style="list-style-type: none"> • Checking email every day • Sending frequent emails even if it is for something minor • Having a regular synchronous online group meeting • Having a group coordinator • Setting up a group
		Sense of connection	<ul style="list-style-type: none"> • Attending a face-to-face meeting. • Spending time together socially.

Categories	Sub-categories	Code	Definition
Suggested Strategy for instructors	Design	Designing for facilitating interaction	<ul style="list-style-type: none"> • Providing multiple communication methods • Having a mandatory weekly group activity during the asynchronous portion of class.
		Providing an overall plan for the class	<ul style="list-style-type: none"> • Providing a specific deadline, checklists, rubrics, and examples.
		Preparing for technology	<ul style="list-style-type: none"> • Setting up a WebCT® course in advance before the first class started.
	Process	Helping Group formation	<ul style="list-style-type: none"> • Helping students a find a group • Limiting group size • Have a face-to-face meeting
		Building sense of connection	<ul style="list-style-type: none"> • Having a face-to-face meeting • Having time to learn each others' background and skills
		Having students build virtual team skills	<ul style="list-style-type: none"> • Having students knowing how to use communication tools. • Addressing groupwork process, strategies, and characteristics of groupwork.
		Being involved in a groupwork process	<ul style="list-style-type: none"> • Checking if they were on track • Providing feedback • Monitor their group work process • Ask if there is any problem.
		Evaluating the process	<ul style="list-style-type: none"> • Being more involved in group evaluation. • Providing a group evaluation rubric or checklist for group evaluation. • Having students submit individual work samples. • Assigning a group meeting time, attending their group meeting, and evaluating each group member.

APPENDIX H: IRB Application

 The University of Georgia Office of The Vice President for Research DHHS Assurance ID No. : FWA00003901		Institutional Review Board Human Subjects Office 612 Boyd GSRC Athens, Georgia 30602-7411 (706) 542-3199 Fax: (706) 542-5638 www.ovpr.uga.edu/hso		
APPROVAL OF RENEWALS / CHANGES				
Request Date: 2007-01-02		Project Number: 2005-10578-3		
Name	Title	Dept/Phone	Address	Email
Ms. Myung-Hwa Koh	PI	Instructional Technology 604 Aderhold Hall	389-6473	mhkoh@uga.edu
Dr. Janette R. Hill	CO	Instructional Technology 604 Aderhold Hall +7144 542-4035		janette@coe.uga.edu
Title of Study: Student Perceptions of Group Work in an On-line Course.				
45 CFR 46 Category: Continuing Review		Renew : No		Change(s) : Change in research site; 6-8 participant observation; Consent form updated; Added background survey
Parameters: APPROVAL OF ABOVE NOTED CHANGES.				
Approved : 2007-01-16 Begin date : 2007-01-16 Expiration date : 2010-04-07				
<i>NOTE: Any research conducted before the approval date or after the end date collection date shown above is not covered by IRB approval, and cannot be retroactively approved.</i>				
Number Assigned by Sponsored Programs:		Funding Agency:		
Form 310 Provided: No				
Your request for approval of renewal and/or changes has been approved.				
You must report any adverse events or unanticipated risk to the IRB within 24 to 72 hours. Refer to the IRB Guidelines for additional information.				
Use the attached Researcher Request Form for requesting renewals, changes, or closures. <i>Keep this original approval form for your records.</i>				
				_____ Chairperson or Designee, Institutional Review Board