

Synchronous Learning Experiences: Distance and Residential Learners' Perspectives in a Blended Graduate Course

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Abstract

Synchronous communication has a great potential to increase individual participation and group collaboration. Despite increasing use, scant research has been conducted on variables impacting successful synchronous learning. This study focuses on learner experiences in a real-time communication mediated by the Breeze web-based collaboration system. It also combined conference mediums. Eight students, 4 residential and 4 learning at a distance, were interviewed to examine the perceived benefits and challenges of synchronous interaction. Study findings showed that learners valued spontaneous feedback, meaningful interactions, multiple perspectives, and instructors' supports. On the other hand, time constraints, lack of reflection, language barriers, tool-related problems, and peers' network connection problems were viewed as challenges. Due to pervasive time pressures, the synchronous interactions mainly focused on task-related issues. Nevertheless, students felt a need for connecting to others in the course and a sense of social presence. Interestingly, no differences were found between the distance and residential students in terms of learning strategies for synchronous discussions.

Introduction

Web-based communication systems have been widely advocated as tools for collaboration that can support self-explanation, social negotiation, and shared knowledge construction among participants (Bonk & King, 1998; Garrison, Anderson, & Archer, 2000; Stahl, 2000). In addition, they are often promoted as tools for leading thoughtful evaluations and analyses, personal reflections, and collaboratively writing about a given topic. However, these benefits often have been discussed on the premise that online communication occurred in a time-independent environment. Conventionally, Web-based communication has depended more on asynchronous, time-delayed, systems, whereas synchronous conferencing systems often have played a supplementary role of socializing, brainstorming, or virtual office hours in online courses (Branon & Essex, 2001); especially in higher education settings. High costs, bandwidth limitations, insufficient tools, a lack of reflection time, and scheduling issues have contributed to their unpopularity (Duemer, Fontenot, Gumfory, Kallus, Larsen, Schafer, & Shaw, Jr., 2002; Learning Circuits, 2006)

Recently, the development of communication technology such as web-based collaboration tools or groupware has made the situation dramatically different. As a result of an awareness and corresponding use of collaboration tools, the use of synchronous systems for instruction has rapidly increased and the potential use of such systems has also been forecasted to continue to grow (Learning Circuits, 2006). According to a survey published by ASTD, 86 percent of their survey participants (N=145) responded that they planed to incorporate synchronous technology

and associated activities into their online courses in the next six months. Importantly, the role of synchronous conferencing is not limited to an optional support medium but rather has extended to an effective tool for fostering social learning processes for various knowledge domains and addressing diverse subject-matters (Orvis, Wisher, Bonk, & Olson, 2002; Park & Bonk, 2007; Pfister & Muhlfordt, 2002; Veerman, Andriessen, & Kanselaar, 2000; Wu, Farrell, Singley, 2002).

Despite these potentials, minimal research on synchronous communication has been conducted (Davidson-Shivers et. al, 2001; Johnson, 2006; Shi, Mishra, Bonk, Tan, & Zhao, 2006). Of the research performed to date, studies of learners' perspectives related to synchronous learning lag far behind. In this study, we examined online and residential students' learning experiences in synchronous critique sessions. The students' perceptions were investigated in terms of the benefits and challenges of live interactions. The following questions were addressed:

- (1) What benefits did the students find in synchronous communication?
- (2) What issues and challenges did the students encounter during the interaction?
- (3) How did the synchronous communication tools promote or interfere the students' learning?
- (4) What learning strategies did the students use for the interaction?

Studies on Learner Experiences in Online Courses

Research has examined learner experiences in asynchronous or/and synchronous learning contexts in terms of the factors influencing student learning and satisfaction. Song, Singleton, Hill, and Koh (2004) surveyed 76 online graduate students to examine their perceptions of the strengths and weaknesses of online learning. This study reported that instructional design, time management, and learner familiarity with online technologies made positive contributions to their learning experiences. On the other hand, the lack of community, unclear goals and objectives, and technical problems were presented as barriers. These researchers recommended that course design should consider not only technological elements, but also the goals, objectives, and expectations for the learners. In addition, they claimed that learners should be encouraged to develop their own learning strategies to adjust to these new learning environments. The researchers stated, "Online courses are dynamic on multiple levels: information is received in a variety of formats and different times. When learners are accustomed to learning in more static, real-time contexts, this can create significant time management issues." (p. 69)

Interactions with peers and instructors as well as collaboration skills were found to be critical elements influencing typical learning experiences within online courses. Kim, Liu, and Bonk (2005) examined the benefits and challenges perceived by the students enrolled in an MBA program in a university setting. These researchers completed a survey with 100 second-year online students and conducted in-person interviews with 22 students. In that particular study, 70 percent of the participants viewed their online learning experiences in a positive manner. These MBA students valued time flexibility, more opportunities for meaningful interactions with instructors, and the development of virtual teaming skills. The majority of the survey participants responded that collaborative work with peers in online courses was helpful. These students thought that team work was more important than independent work for their online learning

courses. In contrast, delayed feedback, difficulty in communicating with team members in different time zones, and a lack of emotional connection were perceived as challenges. These researchers emphasized the importance of virtual teaming and collaboration skills for the online learning effectiveness of MBA students and suggested that further research on effective teaming supports was necessary.

Lack of a sense of community and feelings of disconnectivity often have been expressed as challenges to online learning. Vonderwell (2003), for instance, collected data from interviews with 22 pre-service teachers, email transcripts, and asynchronous discussion transcripts to investigate learners' perspectives and experiences in an asynchronous online course. The findings of this study indicated that interactions or social involvements found in the face-to-face classroom seemed not to develop in the online context during the 10-week course duration. The students considered online communication less personal. The low level of social interactions with the instructor and delayed feedback were perceived as a challenge to their learning. Even though the students wanted to build interpersonal and social relationships with instructors and peers, the students did not seem to actively contact each other. Vonderwell argued that establishing a learning community and facilitating activities were important steps in helping students to be open to each other and starting the social interaction processes and norms necessary for successful online learning.

In a meta-analysis of the research on online learning, Tallent-Runnels, Thomas, Lan, & Cooper (2006) ascribed shallow or low level thinking found in student contributions to instructors' insufficient guidance in synchronous and asynchronous discussions. Along these same lines, researchers such as McIsaac, Bocher, Mahesh, and Vrasidas (1999) found that instructors' prompt feedback, direct involvement in online activities, facilitation of social interactions, and use of collaborative learning strategies influenced learners' positive learning experiences. A more recent report from Woods (2002) examined how instructor's personal emails sent to students in a graduate course influenced their: (1) perceptions of the relationship between students and the instructor, (2) sense of community, (3) satisfaction, and (4) participation in group discussions. No differences were found between groups in their perceived sense of community, satisfaction, or personal relationship with the instructor. Somewhat surprisingly, the level of students' participation was not affected by the frequency of the instructor's email sent to different groups. The researcher concluded, "It is possible that the nature and frequency of discussion *within* formal discussion groups (in light of shifting education paradigms to more learner-centered curricula) has more influence on student perceptions and participation than instructor-initiated communication outside of such formats." (p. 369)

As collaboration and interaction within an online learning community is increasingly emphasized, instructors' roles become more important in terms of facilitating online communication and scaffolding the collective knowledge construction process (Gunawardena, 1995). In response, Duemer et al. (2002) examined a synchronous group discussion on ethical and professional development issues for university engineering students. Noting the relationship between the role of the online instructor and learning community development, this study showed that some behaviors of the facilitators (i.e., also referred to as the "authority") in synchronous discussions had a negative impact on learning community formation. During the discussion, it was observed that authoritative mentors "posed questions, made judgment statements about the responses, and paced the discussion." (p.4) The researchers pointed out that

their strategies might hinder diverse views, meaning negotiations, and social interactions and attributed the inappropriate moderating behaviors to the lack of skills and knowledge about online pedagogy. The needs for faculty training to prepare them for new roles and pedagogy in online environments were highlighted.

Learners' anxiety and concern about a new learning environment has been shown to negatively impact online experiences. Conrad (2002) examined how online learners' experiences in the first class of an online course effected their preparation and engagement in online courses. In this study, survey data was obtained from twenty-eight online students. The majority of the students preferred access to the course site at least two weeks prior to the course start date. The reasons students gave for such preferences included: (1) a feeling of comfort and familiarity (i.e., lowered anxiety), (2) checking for completeness, and (3) getting prepared and integrating this new learning experience into their lives. However, the students did not expect to interact socially with the instructor and students during the preview period. They reported that their comfort levels with course materials as well as the associated course-related processes was more important than interactions with peers during this early period. The students were more satisfied when the course provided the necessary information and was presented in an organized manner. Clear course timelines, well-written course notes, and early and easy to understand course descriptions were found to be helpful.

Wang (2004) examined multicultural aspects of online learning. In this study, the researcher interviewed and observed Asian students who enrolled in synchronous online courses in the United States. The study reported that the students preferred face-to-face courses over online courses even though they thought that synchronous courses were useful. The researcher maintained that synchronous environments were deficient in the sense of learning community and informal interactions among course participants. Particularly, language difficulties were found to be as the largest concern of students. Language barriers kept the students from being active participants in the synchronous discussions. To promote Asian student learning in a synchronous course, several suggestions were made including: (1) regular face-to-face meetings, (2) use of slower speech than face-to-face discourses, (3) opportunities for asynchronous interaction, (4) inter-group activities, and (5) summaries of discussions at the end of such synchronous classes.

Research Context and Method

The current study examined learning experiences in synchronous communication delivery system that was implemented in a graduate course in educational technology field at a research university in the Midwest. In this particular course, master's and doctoral level students learned the principles of message and media design and expanded their learning by developing their own instructional media products. During the 2006 spring semester, twenty-two distance students enrolled in the distance section and eleven of the residential students were registered in the face-to-face section. The students from two contexts collaborated through the use of a synchronous conferencing tool called Breeze for a portion of the course activities and meetings. For example, one of the core assignments required the students to design and develop instructional products (e.g., web-based lessons) within the semester. Peer critiques were employed to provide the students with a chance to evaluate and exchange constructive feedback on peers' ongoing

projects. The critique was scheduled to be jointly conducted by the distance and residential students.

To connect critique participants in different locations and facilitate communication, the meetings were mediated through the Breeze¹ system² and different audio conferencing tools, such as voice chat, a standard telephone call, or text-based chat. The combination of the synchronous communication tools depended on the instructional conditions and instructor preferences for each individual session. At least four critique participations were required for an individual student throughout the semester. The student was assigned to a different critique team for each session that consisted of three to four students and one instructor as a facilitator. A total of 49 synchronous critique sessions were held during that semester (Table 1).

Table 1
Numbers of Synchronous Critique Sessions and Tools Used

Total Number of synchronous Critique sessions held	Tools used for synchronous critique sessions
49 (including 3 practice sessions)	Breeze ³ & telephone (38) ⁴ Breeze & Breeze voice chat (4) Breeze & Breeze text chat (5) Breeze & Breeze voice chat & telephone (2)

The combined communication technologies, such as the Breeze web-based collaboration tool, text-based chat, the Breeze voice conferencing feature⁵, or a standard telephone call were used depending on the instructional conditions and instructor preferences. Adobe Breeze is a recently emerging Web-based collaboration system that can connect instructors and a group of students virtually as well as support environments for multi-media presentations and

¹Adobe Breeze is a Web-based collaboration system that helps to connect participants virtually as well as to support multi-media presentations and collaborations. Since the time of this study, Adobe has acquired Macromedia and renamed Breeze as “Adobe Connect Pro.”

²It is important to note that one of the researchers facilitated eight synchronous critique sessions.

³Breeze was used as a visual display for uploading student’s projects and to help share the same screen during the presentation.

⁴Numbers in parentheses denote the number of critique sessions that occurred via the various communication tools.

⁵Breeze voice conference supports verbal communications among meeting participants.

collaborations. For example, Breeze shared screen function enables users to upload various electronic files to share a visual display during the presentation while Breeze voice conference feature supports verbal communications among participants.

Data were collected from January to July in 2006 through multiple resources such as an open ended questionnaire, individual interviews, observations, course evaluations, and analyses of documents archived in the course website. Eight students including four distance and four residential students participated in the interview. The researcher sent the questionnaire to students who expressed interest in the study in order to collect initial data on their synchronous experiences in this course. The written questionnaire asked about their perspectives in a variety of areas including questions about instructional supports and tools as well as the perceived benefits and challenges. After receiving the written responses, the follow-up interviews were scheduled to gather further information about the issues that emerged in their written responses. The residential students were met in person or interviewed over the telephone while the distance students were exclusively interviewed over the telephone. The interview times varied from 20 minutes to 70 minutes depending on the type and number of issues revealed during the initial responses. The course evaluation results, instructors' critique assessment reports, asynchronous written discussions, and existing interview data from the instructors were used to better understand the instructional contexts examined. The collected data were categorized by pre-determined and emerging categories. Then each category was divided into sub-themes. The identified categories and themes are:

- (1) Perceived benefits of the synchronous critique interactions:
 - (a) Immediate supports and diverse perspectives
 - (b) Social presence and sense of connectivity
 - (c) Structural supports from the instructors
 - (d) Learning strategies
- (2) Perceived disadvantages of the synchronous critique interactions:
 - (a) Time constraints and lack of reflection time
 - (b) Network connection problems
 - (c) Breeze and audio tool related problems

Findings & Discussions

Perceived Benefits of Synchronous Learning

According to the instructors who taught this course, the synchronous peer critique activity benefited their students by offering prompt feedback, diverse views and experiences, and meaningful interactions among participants (Park & Bonk, 2007). The instructors' responses were partly supported by the students' reactions to this activity. The data collected from the course evaluation survey showed that slightly more than 85 percent of the residential students and nearly that same amount (i.e., 84 percent) of the distance respondents agreed that the online synchronous critiques were helpful for completing their projects. In this section below, the discussion focuses on the students' perceptions and experiences found from the individual interviews.

Immediate Supports and Diverse Perspectives

Of the advantages of the synchronous communication, the most frequently discussed benefit we uncovered in the literature was the spontaneous and dynamic nature of interactions that asynchronous communication cannot easily support. (Duemer et., al, 2002; Lobel, Neubauer, & Swedburg, 2002; Orvis et., al, 2002). On the other hand, the time-delayed discussion of asynchronous conferencing benefits students by providing psychologically less pressed conditions that may promote thoughtful discussion and reflection about a given issue (Duffy, Dueber, & Hawley, 1998; Poole, 2000). However, time-delayed interactions likely make some students extremely careful when posting their ideas and consequently, cause procrastination. One of the instructors teaching this course pointed out that, “Students are very cautious, conservative in the amount of what they say or what they try to address in an asynchronous discussion forum. However, synchronously, especially with voice, they go faster and they try things out little more” (Park & Bonk, 2007).

The eight participants interviewed agreed that prompt feedback, responses, and other support from instructors and peers positively contributed to their project improvement efforts. One of the distance students, Jane, contrasted asynchronous communication with synchronous communication in terms of spontaneous responses from instructors. She wrote in her initial response that it was extremely discouraging when instructors did not respond to her email for a week or longer. Particularly when a delayed response was the preferred communication style from course instructors, the situation became worse. She also noted that:

Synchronous interaction is by far the most productive and there is little doubt as to what the other person needs, wants, or means. It is real time and allows for forward movement toward the goal without waiting for a delayed asynchronous response.

Other interview participants in this study appreciated new perspectives and ideas from peers and instructors. They found it helpful to evaluate their projects from diverse views and suggestions grounded in team members’ expertise that can improve each others’ projects. Sara stated:

I gained different perspectives on my projects, which help[ed] me to reconsider about my design in someone else’s view...I also obtained useful help, some of which was very professional. For those issues I could not solve by myself, group members and our instructors provided me a lot of ideas to improve my work.

Auditory elements. The auditory elements of the audio-based synchronous interactions were considered beneficial by the students in this study. Other research shows that learning challenges in online interactions are related to the absence of auditory stimulation (Faux & Black-Hughes, 2000; Vonderwell, 2003). Often, the lack of verbal cues in asynchronous written interactions leads to miscommunications between writers and readers (Vonderwell, 2003; Weiss, 2000). The students in this study agreed that the spontaneous chances for follow-up questions and answers in the synchronous audio or text environment helped their understanding through addressing more contextual information about the presented context. Furthermore, they thought that the multiple channels of input were one of the main benefits of audio-based communication. That is, they were able to receive more information from seeing, hearing, and communicating with peers and instructors at the same time rather than passively sitting and reading from computer screen. In addition, speakers’ emotion and tone delivered by audio tools enhanced mutual comprehension. For instance, Jane commented:

We...tend to want to put a voice to the written word so that when we see a criticism about our work written we put a negative voice to those words. But when you actually hear the voice speaking those same words there is helpfulness and kindness in the tone. There is little room for error in the meaning of the words or critique when you are speaking in real time and can immediately correct any misconceptions of your intent.

Social Presence

Sense of connectivity. During the initial weeks of the semester, some of the distance students exchanged their concerns on the course website such as the feeling of isolation as well as the need for synchronous interactions. Karla wrote that she missed the group work contained in other courses and mentioned, "...I'm looking forward to some chats so I can feel connected again." During the interview stage, another distance student, John, also expressed the same feeling, "I really felt disconnected from the class [in the early month of the course]. When we started the critiques, I felt more like part of the class." Whereas all the complaints about disconnectivity were expressed by some of the distance students, the connectivity issue did not seem to be a problem for the residential students who had chances to interact with peers and instructors in a physical classroom. Interestingly, all related complaints disappeared as the students were jointly involved in synchronous discussions. Not simply having a chance to interact but promoting task-oriented meaningful group interactions seemed to decrease feelings of isolation and helped students to feel more like insiders in this course.

On the other hand, Claire (distance student) expressed that she preferred a self-regulated, independent learning structure over collaborative teamwork. She reasoned that collaboration required more time for communications as well as more computer work. However, she was also looking forward to the real-time meeting. She mentioned:

I must confess that this kind [self-faced and individualized] of class structure suits me better because I have more control of my day. Also, I work 50+ hrs/week in a team environment and am engaged in the collaborative process most of the time. I really enjoyed last semester's class [requiring many collaborations], but I find I crave a break from the computer and from interacting at the end of the day. With that being said, I'm looking forward happily to participating in the first critique.

During the follow-up interview, she noted that because she was involved in a job requiring intensive computer work, spontaneous and fast-paced characteristics of audio-based synchronous meetings saved her time related to reading and writing a critique on a computer.

Emotional Support. The students' interaction during the critique meeting in this study was mainly task-related, such as providing feedback, suggestions, and information. The time constraint of the one-hour critique meeting really determined this focus. However, even though there was little room for non-task related interaction, social presence was observed in the form of humor, compliment, encouragement, or voluntary offer of additional supports outside of the critique meeting. As one student pointed out, "Humor can be used in voice to voice, that is sometimes hard to express in written words unless you know the writer very well and know their sense of humor. We had several chuckles in the critique groups I participated in and that helped ease any tension." The instructors in this course also pointed out that exchanging praises and

compliments on each other's project played a positive role in motivating the students and helped prepare the students for peer criticism.

Garrison et al. (2000) argued that social presence is important since it helps not only to facilitate cognitive task-related ability but also to indirectly facilitate the critical thinking process performed collaboratively by community members. These researchers further argued that "cognitive presence ...is more easily sustained when a significant degree of social presence has been established." (p. 95). Such perspectives imply that, to increase learning effectiveness, it is extremely important for online instructors to understand how to promote social interaction and group cohesion of learning participants under time-pressed conditions.

Structural Assistance

Synchronous communication is not automatically successful without the appropriate instructional supports from instructors. Online instructors' roles are critical not only for supporting subject matter, but also for facilitating the learning process through scaffolds, feedback, and structure (Berge, 1995; Bonk & Dennen, 2003; Mason, 1991). Jane (distance student) emphasized the importance of online instructors' responsibility and feedback for online learning as follows, "If the instructors are not well suited for online delivery then it can be a disaster! Students can be left hanging without guidance and feedback. If I'm here, instructors should be here. Instructors and students alike should have a plan for frequency of answering email."

The real-time critique sessions in this course were designed with flexible structures and scaffoldings before, during, and after the critique to help the students to better engage in the critique. For instance, practice sessions, ground rules, and guidelines were presented prior to the meeting while scaffoldings and technical aids supported the students' discussion activity during the critique. In addition, after each meeting, the students were required to write critique logs and a reflection paper that aimed to help the students' reflection on their performance as well as their peers'. As seen Table 2, the participants identified some of the instructional supports and guidelines as helpful to their progress in this class.

Table 2

Helpful Instructional Supports for Synchronous Critique Perceived by the Students

<p>Instructional Supports:</p> <ul style="list-style-type: none"> ● practice sessions before the actual critique meeting began ● guidelines and ground rules for the critique discussion ● critique structure (e.g., small group based, discussion moderating) ● prompt feedback and scaffolding
<p>Instructors' Expertise on:</p> <ul style="list-style-type: none"> ● topics discussed during the critique ● communication tools used for the critique (e.g., Breeze) ● Web and multimedia authoring software used for the students' project

The students' comments related to the useful instructional supports for the critique meeting included guidelines, feedback, critique structure, and scaffolding. Before the critique activity began, the students were given the guidelines and ground rules. The guidelines aimed to help the students become aware of the assigned roles and provided concrete examples to be included in their feedback (e.g., discrepancies, concerns, and successful features). In response, one student stated, "Ground rules are very helpful and important and everyone [in my group] followed them." Many of the interview participants, in fact, stated that they read the guidelines prior to the critique meeting.

Before the critique session started, four practice sessions were held by the primary instructor including one face-to-face and three text-based online sessions. The face-to-face session aimed to prepare the students (particularly residential students) for the critique procedures and the requirements they performed, whereas the online sessions were geared for the distance and residential students. However, some of the students pointed out that not all practice sessions were helpful because the sessions mainly aimed to introduce critique procedures or tools to be used, instead of involving the students in the authentic critique activities or situations mediated by synchronous tools. That is, it would be more useful if the practice session was held under the exact same conditions as the real critique meeting (e.g., doing critique under Breeze online environments – visual presentation and audio conference). One student said, "[Comparing to practice sessions,] the first [real] critique session provided me a good lesson. While I observed and participated in the critique, I came to know what and how I was supposed to do for this assignment."

Some of the students appreciated the instructors' feedback, scaffolding, and strategies used for the critique. The students wrote in the course evaluation survey:

- He⁶ was well organized for two of my critiques. He effectively controlled the pace and led us to focus on important points of our projects. He also came up with meaningful questions or suggestions about our projects, which gave me a lot of help.
- She was very organized and kept all members involved and moving. Her input and support was appropriately placed in the session. She is very helpful and informative during the critique. She managed time well and provided clear feedback to every one.

The students claimed that timely feedback and other support during the synchronous sessions was highly valued because such instructors' presence not only let them know that they were on the right track, but also kept them motivated and encouraged them to continue to work on the task.

Task-related supports. Throughout the semester, the most frequent questions the students asked were relevant to the incorporation of different software into their design and development projects. The students were required to learn the use of different software. Instructors' level of knowledge and skills about the software and technologies were extremely important. Most participants in this interview were satisfied with the instructors' timely and appropriate answers and follow-ups for their specific questions. For example, one residential student wrote in a course evaluation survey, "My instructor helped me to embed the video clip into my own webpage... Although we met certain difficulty during the process, she was very patient and nice...What is more, she also suggested me to look for help on the forum when nobody around me could answer my question."

The timely supports in this course were possible because the real-time critique discussions were facilitated by one primary instructor and five graduate assistant instructors who had an expertise in instructional media design and/or design software. When designing a synchronous small group activity, online instructors need to take into account the team teaching availability, such as recruiting qualified facilitators or training teaching members to function effectively within a course.

Special attention to the students with difficulties. The results of this study indicate that special attention helps a group of the students to be more engaged in real-time discussion. For instance, audio-based synchronous communication was likely to create additional challenges for some students for whom English was not their native language. One of the students mentioned that it was somewhat more difficult to understand peer's verbal inputs without facial expressions and gestures. The difficulties became more serious for him particularly when the audio conference tool created severe echo or the speakers spoke too softly or fast. He stated, "Due to audio problems, I didn't understand what they were talking about. It's hard for me to ask it [to repeat their comments] again." He appreciated the supports that his instructors provided for him during the critique: "When I had difficulties in understanding students' comments, my instructors helped me by rephrasing or summarizing their comments. Without instructors, I don't think that I can make the critique session."

Summarizing discussion is an effective strategy not only for moderating synchronous exchanges but also asynchronous communication (Bonk & Reynolds, 1997; Wang, 2004). Regardless of students' first language, summarizing can help students to focus on important

⁶ All personal pronouns included in the comments refer to one of the teaching assistants who the student worked with.

issues discussed and prioritize the problems to tackle. One online student whose first language was English commented, “A summary at the end by either the instructor or the participant was helpful...Even though I had the same remarks noted it was good to hear the instructor repeat them.”

Learning Strategies

No participants in this study had experience with audio-based synchronous communications before. The previous online courses the students had taken mainly used asynchronous formats, while, if used at all, synchronous interactions were text-based. To determine their learning strategies for audio-based communication, the students were asked how they prepared for the activity.

No big differences were found in the strategies employed by the online and residential students. They used similar approaches to complete the activity. For example, in terms of strategies used before the synchronous session, the participants: (1) read critique guidelines and course requirements before the meeting, (2) reviewed their own projects as well as other team members projects (if available) to be discussed during the critique, and (3) prepared the feedback and suggestions on team members' projects. During the actual session, they (1) wrote down critique ideas and suggestions from team members, (2) used questions to elicit more information from presenters, and (3) wrote down any feedback received from the group during the critique.

However, one of the residential students attributed his difficulties in this activity to the lack of information about effective learning strategies for synchronous interactions. The student claimed that he could have engaged in tasks more effectively if he had been aware of any learning or communication strategies. The same student also mentioned how his cultural norm influenced the way he was involved in learning process. For example, he preferred to ask peer students for assistance instead of the course instructors. He mentioned, “It also might be related to cultural norms. Because of my cultural norm, I hesitated to direct my questions to the professor. Still, I am wondering how much is appropriate for me to seek supports from her [the professor].”

The communication medium changes the nature of the communication patterns (Carabajal, Lapointe, & Gunawardena, 2003). Thus, identifying and addressing the needs of the students who have difficulties (e.g., languages barriers or lack of technology equipments, skills, or bandwidth) will help the students to engage in the activity. It is recommended for instructors to record audio communication and store it in the course website for learners to use it over time. The recent emergence of podcasting of face-to-face lectures (or making a downloadable audio file available after class) fits well with this point. Similar to these recommendations, Wang (2004) also made several suggestions including slower speech during audio conference, use of an asynchronous format to supplement synchronous communication, and discussion summarization.

Perceived Disadvantages of Synchronous Communication

Time Constraints and Lack of Reflection Time

In this course, each synchronous critique group was composed of three to four students and one instructor [facilitator]. The available time for each session was about one hour. Unlike time-independent discussions, the students indicated that the one hour meeting placed a

constraint on sufficient discussions about all members' artifacts. The time pressure sometimes led to superficial comments, not thoughtful feedback. For example, Susie mentioned that this often resulted in, "Not enough time for everyone to think and respond effectively." Another student, Sophie, indicated, "I did not have enough time to focus on other projects' detailed content. Therefore, usually I only made comments on the form or general website arrangements [if the artifact is a website]."

When asked, some students made useful suggestions to relieve the perceived time constraints. For example, depending on the instructor assigned to a critique group, the students were or were not provided materials to be critiqued before the meeting. The students noted that the chance to pre-review other team members' materials helped them to bring more constructive feedback to the meeting. Mary claimed that, "Sometimes it takes me awhile to stare at something and click around it and then really figure out constructive comments. Even if it [the materials to be critiqued] wasn't available, maybe their report on [the] project plan [submitted to the instructor] gave some foundations." Susie echoed that it would be useful to be given brief information about team members' projects before the meeting. In effect, such information would eliminate much of the time needed for project background information and allow more time for team discussions.

I think maybe encouraging the presenters to submit one-page description about their production before the critique might help. Also, we could be given some examples or template about the critique areas that we can focus on. Therefore, in the actual critique session, we can then just talk about the feedback rather than spending time to introduce the background of their project.

Other student, Jane, suggested that a worksheet or critique form given by the instructors could have guided students as to what to look at in members' artifacts and help them organize their thoughts.

Some students questioned the rigorousness of the peer feedback given that their team members were often too polite to criticize each other. Chris commented, "[One of the critique sessions] was not entirely [a] "critique" session. I mean that sometimes people just tend to praise someone's work... In other words, it must be hard for us to critique the work of someone who we have never seen [in person]." Another student, Sophie, was not satisfied with the critique structure because she felt it hindered a meaningful critique. The student indicated, "Since we had different groups in different critiques, people were often new to their group members and their projects, which limit[ed] the further critique on these projects."

Although only a few negative comments related to instructional supports were expressed by the interview participants, these still imply that there were some inconsistent and insufficient supports that the instructors provided for the activity. When team-teaching is used, it is essential to maintain clear communication among team teaching members to exchange information about the apparent difficulties or alternative approaches as well as to align approaches and supports to each other.

Network Connection Problems

Some of the students' network connection problems sometimes forced the students to be disconnected during the discussion, or kept an entire group of people from using more preferred voice conference tools. Sophie indicated, "In one critique, my group member got into trouble because of the speed of Internet, which made her really nervous. In another [session], I was

kicked-off by the Breeze system and could not enter again for a couple hours.” An unstable connection was seriously troublesome not only for the student with the problem, but also for other team members.

Note that the instructors in this course had options to select different conference tools. When one option (e.g., Breeze voice chat) did not work properly, they could switch to the other available tools (e.g., telephone or text-based conference). However, online instructors in other programs may not be given alternative choices, and, even if that were the case, there would be no guarantee that they would use them. Despite best intentions, a single communication software or system selected by the university may discourage instructors from using the tool. It is recommended that various available options be introduced to instructors to try and to test them before incorporating the medium into their actual course.

Audio Tool Related Issues

All eight participants agreed that the Breeze shared screen function was the most convenient feature for the synchronous critique discussion. It allowed the presenter to upload a file on the Breeze screen to present visual materials, which made it easy for the other participants to see the same materials during the presentation and easy to follow any page changes and navigation routes the presenter made. Interestingly, no one used the Web camera to deliver their own appearance. As Jane mentioned, “...Breeze was a wonderful tool. The conference and sharing setting made it so much easier to understand the viewpoints of the other members of the group. Not everyone is a natural writer and many have difficulties getting their points across in written form.”

On the other hand, the students noted that the Breeze voice and telephone conference were equally easy to use and also problematic due to noise or echo occurring during the conferencing. One distance student mentioned, “[During the Breeze voice conference,] it was difficult for me to follow what was being said because there was a terrible echo that we could not get rid of, it was very distracting. The message was still gotten by all in the end but it would have been nicer to not have the distraction.” The problems related to audio sound caused headaches that seriously impeded discussion. The telephone conference seemed to relatively support a more stable condition than the Breeze voice chat. However, telephone connection also created problems when more than three people were connected at the same time.

Again, it is important for instructors to have alternative options to select the proper equipment for different conditions. The equipment used is not necessarily expensive and sophisticated. For instance, free, ubiquitous tools like Skype or MSN Messenger can help instructors to effectively facilitate a small group audio conference. The tool-related problems are identified as Table 3.

Table 3

Problems on Synchronous Tools Experienced by the Students

Tools	Advantages	Disadvantages
Breeze Shared- screen	<ul style="list-style-type: none"> • Screen-share feature that makes it easier to share documents, video clips, and web pages with participants during the presentation 	<ul style="list-style-type: none"> • Limits on types of files getting to work on Breeze screen • Delays or difficulties in playing large-sized files • Shared screen that fails to display the elements as in the same manner as the presenter's materials.
Breeze Voice	<ul style="list-style-type: none"> • Convenience of hearing and speaking with each other during the virtual presentation 	<ul style="list-style-type: none"> • Noise and echo • Technical problems of team members, such as connection speed and microphone
Telephone Conference	<ul style="list-style-type: none"> • Easy access • Stable condition 	<ul style="list-style-type: none"> • Voice quality that is vulnerable to the selected equipment (conferencing devices) and user conditions (e.g., cell phone vs. land phone connections).

Conclusions and Implications

This study has examined how the students perceived the effectiveness of synchronous communication mediated by a combination of conferencing tools (Breeze shared-screen and Breeze voice, telephone, or text-based conference). The results of the study showed that, overall, the students were satisfied with their experiences in synchronous critique discussion. The students indicated that live communication was beneficial for them to exchange prompt feedback and suggestions without delay. Audio live communication provided verbal cues and spontaneous chances for clarifying issues or ideas that helped increase participant mutual understanding during discussion. The students also indicated that regular meaningful interactions scheduled across the semester enhanced social presence and a sense of connectivity among the participants which played an important role in their willingness and satisfaction.

Despite such positive findings, the typical one hour fixed time session placed a constraint on sufficient discussion and thoughtful feedback. The audio tool related problems and team members' low speed or unstable network connections had a negative influence on communication and group performance. In addition, to some students who had a language barrier, it was more challenging to communicate with their peers without face-to-face interactions. Sound problems like noises and repeats created more difficulties for them. The

students indicated that instructional assistances could have helped them to better engage in the activity. Table 4 summarizes some of these findings.

Table 4

Advantages and Disadvantages of Audio-Based Synchronous Communication Identified by the Students

Advantages	Disadvantages
<ul style="list-style-type: none"> ● Prompt support and feedback ● Enhancement of a sense of connectivity ● Different perspectives and useful supports from peers and instructors ● Learning how to critique peers' project ● Learning how to evaluate my own project ● Useful communication tools ● Regular fixed-time meetings allocated across the semester giving iterative due dates and keeping work on the project 	<ul style="list-style-type: none"> ● Time constraints ● Fixed time meeting causing troubles in scheduling because of different time zones ● Lack of in-depth critiques ● Lack of reflection time ● Internet connection problems ● Audio tool-related issues ● Language barriers worsen ● Lack of information on learning approaches for synchronous communication and collaboration

Given that scant research has been conducted on learner perception in synchronous communication, this study may provide insights to faculty and administrators in higher education on students' perspectives, effective instructional supports, and different synchronous tools. The selection of the proper communication medium has an important impact on not only accomplishing group goals, but also on maintaining a learning community (Ahern & El-Hindi, 2000). Davidson-Shivers, Muilenburg, and Tanner (2001) cautioned against the assumption that a certain communication mode is more useful than another delivery mode. They noted, "Both discussion modes - online chats and threaded discussion - warrant use within online courses. They clearly can be used for different purposes and provide different, but useful, means for students to engage in discussion and learning." (p. 365).

It is vital, therefore, for instructors to have solid knowledge and skill in various mediums available as well as an awareness of the appropriate pedagogies, challenges, and new roles for various types of synchronous and asynchronous environments. As for students, making sense of how to interact with other participants contributes to students' learning and satisfaction (Thurmond, Wambach, Connors, & Frey, 2002). Instructors need to provide students with effective learning approaches for time-pressed live learning and encourage students to share, experiment, and reflect on new strategies. In addition, it is suggested that planned assistance and guides should be provided in order to address the needs of a group of students who have language barriers.

Since synchronous learning communication provides unique environments that are different from asynchronous online discussion and face-to-face interaction, further research needs to develop instructional approaches that can maximize the benefits of the synchronous communication medium. We hope that this study will provide some assistance in such research endeavors as well as offer some guidance to those in the trenches of synchronous instruction as well as those making decisions about synchronous programs and course delivery.

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