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# Developing Interdisciplinary Team Competencies in a Blended Learning Course: Impact on Student Learning

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### ABSTRACT

**Purpose:** Health science educators increasingly focus on preparing health science students to work in interdisciplinary environments. Interdisciplinary communication is often hindered by geographic distances, creating barriers to effective interdisciplinary practice. Information and communication technologies are tools that can help reduce these barriers. Therefore, it is critical to ensure that students learn to communicate and collaborate with other disciplines in both face-to-face and on-line settings. The purpose of this article is to describe students' perceptions of developing team skills in an interdisciplinary team context using a blended learning format. Understanding the students' experiences will help health science educators prepare students effectively to use these technologies to facilitate interdisciplinary teamwork. **Method:** An interdisciplinary team development course was redesigned to be offered in a blended (70% on-line asynchronous/synchronous activities) format to increase flexibility and to provide experience with using the advanced communication technologies. This paper presents qualitative results obtained from student focus groups. The focus groups captured the students' perspectives of the development of interdisciplinary team competencies in a blended learning format. **Results:** Although students generally felt they developed interdisciplinary team skills in a blended learning environment, they also expressed mixed feelings about how the environment affected the process of team development. **Conclusions:** Students' perceptions of developing and practicing team skills in an interdisciplinary team context were not compromised in a blended learning format. Future research can further explore the on-line dynamics among students from various disciplines and the impact of this type of learning as a team on clinical practice.

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### Introduction

In Canada, health care reform is a national concern at both provincial and federal levels. A recent Canadian Health Services Research Foundation (CHSRF) report highlighted interdisciplinary teamwork and collaboration as key strategies in service delivery.<sup>1</sup> Health science educators are increasingly focused on preparing health science students to work in interdisciplinary environments. However, geographic and cross-discipline communication create challenges. Information and communication technology is a tool to potentially help address these issues. Therefore, ensuring opportunities for students to communicate and collaborate with other disciplines in both face-to-face and on-line settings is critical to future health professionals' practice.

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Courses that have integrated on-line aspects have typically utilized asynchronous communication rather than synchronous communication. These courses also often used asynchronous technology such as WebCT, web-boards, or email to replace face-to-face classroom instruction.<sup>2-5</sup> These technologies allowed students to interact at their convenience, but not necessarily at the same time as other students. One study in health sciences education reported the use of synchronous technology within one discipline.<sup>6</sup> However, currently there are no studies available that describe synchronous learning environments for interdisciplinary teams of health science students.

Students' perceptions of and satisfaction with the environment influence the success of learning environments, regardless of delivery format.<sup>7</sup> The majority of literature on asynchronous on-line learning identifies both strengths and challenges of this delivery format. Students report that they are able to carefully consider other students' comments when the comments were made on-line. On-line delivery also allows students to participate at their own convenience.<sup>8,9,10,11</sup> However, delays in response time can be a challenge and cause frustration compared to a face-to-face classroom.<sup>8,9,12</sup> In addition, Vonderwell and Song et al. both report that students often lack a sense of community and connection with their instructor in an on-line environment resulting in a lower satisfaction with the learning experience.<sup>9,10</sup>

Providing pre-licensure interprofessional educational opportunities requires overcoming several logistical barriers.<sup>13,14</sup> Issues related to timetabling, geography, and physical space are ongoing challenges for institutions implementing interprofessional education.<sup>13</sup> Flexible delivery of interprofessional courses can provide one possible solution to these logistical barriers. An interdisciplinary team development course was redesigned using a blended (70% on-line) format to increase flexibility in interdisciplinary course delivery and introduce students to the advanced communication technologies that are prevalent in health care systems. The term "blended learning" has been used broadly to refer to the integration of different learning methods. In this study, blended learning describes instruction that is delivered both in the classroom and using synchronous and asynchronous on-line communication tools. Observational and student self-report data of the development of interprofessional competencies in this blended learning environment were reported elsewhere.<sup>15</sup> Students in the blended learning teams demonstrated no significant difference in developing interprofessional team skills as compared to students in the traditional face-to-face teams.<sup>15</sup> This paper will present students' perspectives of developing interdisciplinary team competencies in a blended learning format using data obtained from focus groups with student participants.

## **METHOD**

### **Course Description**

In the interprofessional team development course, the learning outcomes are defined to enable students to understand the roles of health professionals, demonstrate team process skills, use consensus decision making, and share a patient-centered approach. The course is a requirement for nine Health Sciences programs at the University of Alberta (dental hygiene, dentistry, medical laboratory science, medicine, nursing, nutrition, occupational therapy, pharmacy, and physical therapy). It is optional for students from the Faculty of Physical Education and Recreation. Enrollment each year is approximately 750 students. Over a five-week period, in two three-hour classes per week, the teams discuss complex case scenarios. Each class focuses on a key team process skill (e.g. giving/receiving feedback, consensus decision-making, conflict resolution, and reflection). A more complete description of the course is reported in Taylor et al.<sup>16</sup>

#### *Student Selection*

Participation in the blended learning version of the course was voluntary. A total of 47 students from across the disciplines volunteered for the blended version. There was space for 24 students divided into 4 interdisciplinary teams. Teams were intentionally balanced by discipline following the normal procedure during the traditional face-to-face (F2F) course offerings. In cases where more students volunteered than the allowed number of discipline spaces, the students for the blended teams were randomly selected to participate. The students not selected for the blended teams registered in the F2F version of the course.

### **Course Redesign**

The four blended learning teams were comprised of 4 students each from medicine, nursing, nutrition, and occupational therapy, 3 students from pharmacy, and 1 student each from physical education, dentistry, medical laboratory science, and physical therapy. The blended course utilized both asynchronous and synchronous technologies for course delivery. WebCT, a course management system, allowed the students to work on-line asynchronously. Tasks included accessing library resources, viewing video clips, pre-class readings, submitting work, and downloading notes and assignments. Students logged in at different times to complete the work in preparation for each synchronous class. For example, students could be required to obtain pre-class reading materials, view streaming video segments, and complete a small assignment.

Synchronous on-line classes used the Elluminate ([www.illuminate.com](http://www.illuminate.com)) (voice over the internet) desktop virtual classroom environment to support their interactions. The virtual class organizational structure was modeled on the traditional class. Class times were set to match those of the traditional F2F class. During each class, the facilitator and students could interact through a

combination of interactive whiteboard, instant messaging, voice (headphones with microphone), and/or WebCam. One critical difference was that real-time voice communication used a “walkie-talkie” mode whereby only one student could speak at a time. Students could raise a hand to request to speak at any time and all speaking requests were logged in ascending order.

Figure 1 shows a typical Elluminate session in the blended course. On the left hand side, in the *Participant Info* box, student C-Tiffanye has access to the microphone, instant messaging, and both writing on and viewing the whiteboard. The whiteboard itself can be used to display PowerPoint slides, Websites, or for the instructor and students to write information to share with the class. Emoticons (happy/unhappy faces, hands clapping and thumbs down) are used to express emotions quickly. All sessions can be recorded for later playback. To begin working with their team, the facilitator moves each student into breakout rooms or “folders” where private communication amongst the team occurs. The facilitator then “drops in” to work with these teams. At any time the instructor can reunite the teams into a single class. A more detailed description of the course redesign is reported by Carbonaro et al.<sup>15</sup>

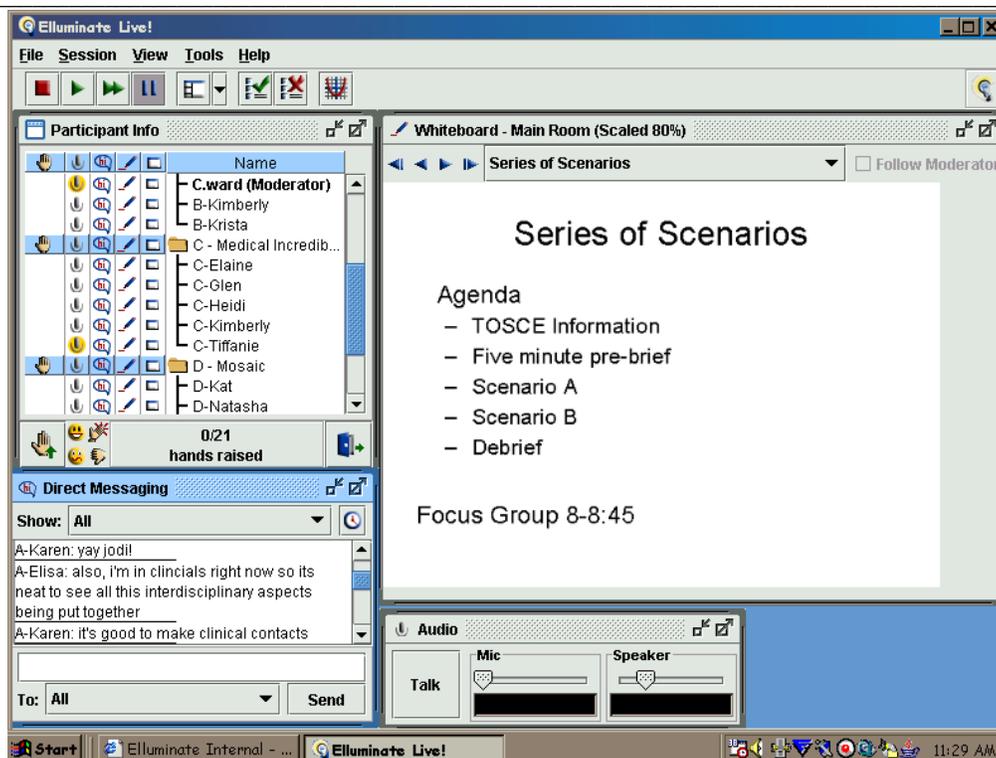


Figure 1. Typical Elluminate Session

### Focus Group Interviews

The students in this study participated in one of two hour-long semi-structured focus group interviews that were conducted on the second last day of classes. Each focus group contained eight students. Each interview was conducted and recorded through Elluminate and transcribed verbatim. Focus group questions focused students' experiences during the course including their perceptions of what was rewarding, what was challenging, and what they learned in the course. Specific learning questions centered on the course objectives of giving/receiving feedback, consensus decision-making, team roles, and reflection. Content analysis of the transcripts was used to explicate the students' answers to the focus group questions<sup>17</sup>. Two researchers coded the transcripts to develop themes that represented the participants' experiences in the course.

## RESULTS

### Focus Groups

The following themes emerged from the focus group data: Using the Technology, Meeting Course Objectives, Challenges, and General Comments.

**Using the Technology.** Students reported that Elluminate was generally self-explanatory and easy to use. Students expressed a challenge with using the whiteboard within Elluminate, initially saying it was confusing and time consuming, but it became easier with experience. Some students reported finding it challenging that they could not speak simultaneously, but most felt that

this also provided a more effective use of time. The biggest frustration in using the technology was when students were occasionally “kicked out” of the session. WebCT use was not an issue given that students in the focus groups all reported having used this technology previously.

**Meeting Course Objectives.** The key process skills this course strives to develop in students in an interdisciplinary team are giving/receiving feedback, consensus decision-making, team roles, and reflection. Overall, students expressed that interacting in the on-line environment facilitated learning to collaborate with other disciplines:

*I personally do not think that being on-line that I was losing anything . . . collaborating with colleagues from other health professions. (nursing student)*

*I think it still definitely hits the goal of working with other people from other healthcare professions (medical student)*

**Giving and receiving feedback.** Students stated that providing feedback in an on-line environment allowed for more time to reflect on what was to be said. They also reported that statements felt less confrontational on-line, which allowed them to be honest, and at times disagree without seeing the reaction:

*...you had time to really think about what was said and wait your turn and formulate a response, which sometimes we tend to interrupt each other without really listening. So, in a way, it's a different skill I think you learn from on-line. (physical education student)*

**Decision-making.** Although students reported that making team decisions was challenging on-line, they also reported that they were able to improve with practice. The fact that they had increased reflection time might have provided for more effective decision making overall. However, students commented that they missed the nonverbal reaction that F2F decision-making allows for:

*I think we depended on the strengths of the initiator to kind of say “ok, I hear you, and I think what you guys are saying, this is number one, this is number two, do we agree?” and sometimes we just went around in circles. (physical education student)*

**Team process roles.** Similar to comments from students in previous offerings of the F2F class, the purpose of using team roles (Initiator, Recorder, etc) in an on-line setting was unclear. Some students felt roles were important to learn, others didn't feel there was a purpose. However, the students agreed everyone should have an opportunity to be the Initiator, which is interpreted as team leader at least once:

*It was kind of neat to see how we evolved as a team. The first night I think was a lot of dead airtime [using Elluminate synchronous voice] whereas towards the end of it, more of us were jumping in once we figured out what our roles were. (medical student)*

**Teamwork.** Comments were mixed when students were asked about developing or forming a bond as a team. Some expressed the opinion that they had to work harder to develop as a team in the on-line setting because they were physically isolated from each other. Others stated that the “air time” was limited in the on-line environment so what was said had to be important, thus eliminating social “chatting” that may contribute to team bonding:

*I think that when you're face to face you can form friendships easier and we had the side conversations and the jokes that you have to take the whole airspace to say anything, it kind of has to be important and so I don't really think that we get that bond that you would otherwise. (physical therapy student)*

**Development of communication skills.** All students expressed challenges with developing and practicing non-verbal and verbal communication skills. In an on-line setting, one cannot rely on subtle body language cues that one would in person. For example, the Standardized Patient Interview was particularly challenging because the students did not have any visual cues to assist with the interview:

*I thought that the standardized patient was really tough to do on-line, especially after talking to people that had done it face-to-face, because some of them had, like patients that were crying and really responding, and I think body language plays a really big part, especially considering what we were discussing, and you definitely miss out doing that doing it on-line and not doing it face to face in that we didn't see the person and we didn't get any response, so it kind*

*of takes away a lot of the emotional aspect of it which I think is really key when you're dealing with the patient and especially as a group,... because I think it's really important to have like the whole body language, facial expressions, and the emotional side of it... (medical student)*

Students also recognized that they did not develop strategies to address interrupting one another because the technology only allowed one person to speak at a time:

*Sometimes it was tough to get on [to talk]. We had a session where it was almost impossible to jump in and interject every once in a while part of that, a way to alleviate that, is raising your hands, which we kind of discovered over the course of things. (medical student)*

*In terms of the mic [microphone] thing and how people can't really talk at the same time, I think it's a really good thing. People who tend to dominate conversations, because this way it really slows down the conversation and everyone has a chance to talk and while you're talking you have the time to have your whole say while no one can interrupt you at the same time, because a lot of times in a group, you'll start talking and then someone will talk over you and then your thought is lost. I think it really teaches people who have an overbearing personality to just kind of step back for a minute so you can really listen to what people say and then respond afterwards and wait your turn, so I really liked that side of it. (medical student)*

**Distractions.** Students acknowledged that they could become easily distracted in the on-line setting. First, the text messaging box provided an area for the students to "chat" whether it was course related or not. During the Standardized Patient Interview, it was interesting to note that some students felt there was an unfair advantage for the on-line teams as they could message each other during the interview and make suggestions, which could not be done during an in-person interview. Second, students could check emails or do other non-course related activities without anyone observing.

**General Comments.** Generally, all students in the blended learning course felt it was a positive experience and should be expanded for future offerings. Students appreciated that they did not come home late after an evening class and that their time at the University was shortened. In addition, students recognized that learning in an on-line environment was good preparation for clinical practice as they saw this as the "way of the future":

*I think that more and more our lives are going to become interdisciplinary and we will not have time to spend the travel time to get to meetings, so I think that this is going to be the wave of the future. (physical education student)*

## DISCUSSION

Previous reports on health science on-line courses have typically described asynchronous interactions among single discipline students. This study was unique in that it not only provided a collaborative context for health science students' learning, but the collaboration occurred using mainly synchronous technology (voice over the internet) with some F2F and asynchronous interactions.

An overarching theme is the need to establish the right level of balance between F2F and on-line team-based interactions. Although students generally reported that communicating with interdisciplinary health teams via the Internet is the "way of the future" in patient care, they also recognized the importance of developing effective F2F skills. For example, the team based problem-solving exercises are designed to advance interdisciplinary practice with patients. The lack of F2F experience with a standardized patient appears to be a drawback in the current blended format. Therefore, some level of F2F team-based experience with a standardized patient should be included to increase the richness of the blended learning experience.

Overall, the students indicated high levels of satisfaction with their blended learning experience. They stated that providing feedback was easier in an on-line environment because there was more time to reflect on what to say and they were more comfortable being honest with their feedback. These findings support those of Petrides and Vonderwell who suggested that on-line communication allowed for deeper reflection.<sup>8,9</sup> Students pointed out that on-line team interactions may help to eliminate or reduce the impact of dominate personalities who tend to control F2F discussions. Furthermore, the synchronous technology (Elluminate) was generally easy to use and did not appear to hinder the development of team skills.

Challenges identified by students echoed those represented in the literature and included the observation that the on-line environment allowed for easy distractions away from the course tasks and the development and enhancement of communication skills, such as verbal and non-verbal communication skills.<sup>8,9,12</sup> The communication challenge was most pronounced during the standardized patient interview. In addition, students recognized that they did not develop strategies to address interrupting each

other. Finally, students expressed mixed feelings regarding the environment facilitating their formation as a team. About half of the students felt that the physical isolation forced the team to work harder to bond, while others felt that there was less social chatting in the on-line setting, therefore less team bonding.

Although the majority of students are from programs where group work is required, most of the students did not have previous experience with F2F interdisciplinary team-based learning with which to compare their experiences in the blended course. Some of the comparisons by the blended learning students to the F2F course were based on information from their peers in the F2F version of the course, not from personal experience.

This study determined that from the students' perspective, interdisciplinary team skills were developed in an on-line environment that blended asynchronous/synchronous on-line activities with F2F interactions. Further investigation of this blended learning environment for teaching interdisciplinary team-based skills is required in order to explore the influence of individual learning styles. In addition, further research may also explore the most effective balance between F2F and on-line interactions to optimize the development of interprofessional competencies and interprofessional learning experiences.

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