

## EDUCATION

# Interprofessional care of elders: Utilizing the virtual learning environment

Mary Val Palumbo, DNP, APRN, GNP-BC (Associate Professor)<sup>1</sup>, Jennie C. De Gagne, PhD, DNP, RN-BC, CNE (Assistant Professor)<sup>2</sup>, & Gwendolyn Murphy, PhD (Associate Consulting Professor)<sup>3</sup>

<sup>1</sup>Department of Nursing, College of Nursing and Health Sciences, University of Vermont, Burlington, Vermont

<sup>2</sup>School of Nursing, Duke University, Durham, North Carolina

<sup>3</sup>Department of Community and Family Medicine, Duke University, Durham, North Carolina

### Keywords

Interprofessional relations; nurse practitioner communication; geriatric; education.

### Correspondence

Mary Val Palumbo, DNP, APRN, GNP-BC, College of Nursing and Health Sciences, University of Vermont, 106 Carrigan Drive, Burlington, VT 05405-0068.

Tel: 802-656-0023, 802 371-7743 (cell);

Fax: 802-656-8306;

E-mail: mpalumbo@uvm.edu

Received: 14 October 2015;

accepted: 6 March 2016

doi: 10.1002/2327-6924.12368

### Abstract

**Purpose:** Interprofessional education (IPE) is essential for preparing nurse practitioner (NP) students to provide care in a collaborative team environment. The combination of a virtual clinic and video conferencing designed for NP students to practice interprofessional collaboration has not been studied. This study examined students' perceptions of the virtual learning environment which was developed to improve interprofessional competencies.

**Data sources:** A survey instrument developed to evaluate interprofessional practice competencies was administered to student participants from eight disciplines ( $n = 71$ ) following eight video conference discussions of an elderly patient presentation in a virtual clinic.

**Conclusions:** The distribution of responses was significantly associated with interprofessional competency domain ( $p = .002$ ). The distribution of responses was also significantly associated with discipline ( $p < .001$ ). Participants rated the value of this activity positively.

**Implications for practice:** A virtual clinic and video conferencing was an acceptable learning platform for students, which can be used to simplify IPE logistics. The roles and responsibility competency domain is perhaps the hardest for novices to grasp. Teaching meeting facilitation is a necessary part of IPE for NP students to be able to use these skills in the future.

## Introduction

Interprofessional teamwork is essential to provide high-quality and safe patient care, which has resulted in ongoing efforts to integrate interprofessional education (IPE) into curriculum and clinical practicum. Among a variety of innovative pedagogies for promoting interprofessional competencies, virtual worlds have been explored and evaluated in a number of studies with varying levels of success (Cook, 2012; Heinrichs, Youngblood, Harter, Kusumoto, & Dev, 2010; Kenaszchuk, MacMillan, van Soeren, & Reeves, 2011). A framework and checklist for guiding the development of virtual learning environments has even been recommended because of the complexity of collaboration needed between technical and subject experts (King et al., 2012). As more research is done to evaluate the effectiveness of virtual learning environments, its many benefits for IPE are becoming clear.

Virtual or web-based learning has also been used specifically for practicing the care of elders by an interprofessional team (Dow et al., 2015). In this study, 522 students over a 6-week period assessed and planned care for an elder in teams that communicated through message boards. It is clear that virtual worlds have the potential to make active learning at a distance possible while accommodating busy schedules and large groups of students (Miller & Jensen, 2014). In a review of the use of virtual worlds in nursing education, three overarching themes were identified: (a) critical reasoning skills, (b) student-centered learning, and (c) instructional design considerations (De Gagne, Oh, Kang, Vorderstrasse, & Johnson, 2013). Nursing student acceptance of virtual learning has been positive. A majority (94%) of students liked the idea of using technology to enhance healthcare education, and 88% believed that nursing education should make

better use of video games and related new media technology (Lynch-Sauer et al., 2011).

A blended approach to IPE has been advocated, including face-to-face meeting as well as a variety of online activities (Riesen, Morley, Clendinneng, Ogilvie, & Murray, 2012). Video conferencing simply involves distance spanning communication via a variety of online platforms, and has proven to be extremely useful in rural areas or even urban settings with students in different locations. Communication via video conferencing is becoming more popular in education (Clemens, 2015; Ray, Fried, & Lindsay, 2014), practice (Azar et al., 2015; Hofflander, Nilsson, Eriksen, & Borg, 2016), and research (Bull et al., 2014; Rowe, Rosenheck, Stern, & Bellamy, 2014).

The purpose of this study was to evaluate if a virtual learning environment which included video conferencing was perceived as effective in promoting interprofessional competencies by students from eight different health professions. Because interprofessional examination of the case of a frail elder and facilitation of the team's discussion using video conferencing were new skills for the nurse practitioner (NP) students, Benner's Novice to Expert theory (1984) provides an appropriate framework.

## Methods

### Participants

Faculty from eight different disciplines collaborated to include students in this interprofessional activity. Graduate students in Nursing (NP), Medicine (MD), Pharmacy (Pharm), Physical Therapy (PT), Nutrition (RD), and Communication Sciences (SLP) participated, as well as undergraduate students in Social Work (SW), and Exercise Science (ES). The activity was voluntary for medical students and was a class or course requirement for the other disciplines.

### Preparation

All students were required to complete a module of background information on elder care and interprofessional practice and reviewed the Core Competencies for Interprofessional Collaborative Practice Report of an Expert Panel (2011). The NP students received additional training in how to facilitate an interprofessional meeting. This training included how to create a meeting agenda, set a goal for the conference, assign roles for all participants to enhance engagement (Prelock, Beatson, Bitner, Broder, & Ducker, 2003), and manage the logistics of the video conference. All students accessed the virtual clinic to review a medical record and interview the elder according to their professional role prior to the video case conference.

### Virtual clinic

A virtual clinic is a place where students can assess a patient and practice their interviewing using their own avatar according to their preferred screen image. The virtual clinic was created by the faculty from the eight disciplines with the technical expertise of professional video gamers. For this virtual clinic, the following types of interviews were available: Primary Care Provider (for NP/medical students), Physical Therapy (for physical therapy and exercise science students), Nutrition (for dietary and communication science students), Pharmacy (for pharmacy students), and Social Work (for social work students).

Each interview uncovered different aspects of the patient's history that were important for the team to consider. During the interview of the Korean elder, students had to choose questions culturally appropriate, open-ended, jargon-free, and consistent with the principles of Motivational Interviewing (Rollnick, Miller, & Bulter, 2008). They also had to listen to an interview at the pace of an elder and review the notes of the last primary care visit, labs, and notes of a recent emergency room visit. The virtual visit did not include a physical exam (see Figure 1 for a screenshot of the virtual clinic interview).

### Video conferencing

For discussions of the virtual clinic case, eight video conferences, 90 min in length, were held during evening hours. The ReadyTalk platform was used for the video conferences. Meeting roles were included: facilitator (NP student), recorder, timekeeper, jargon buster, equalizer, keeper of the rudder, processor (faculty), and wellness provider (Prelock et al., 2003). Students selected their meeting role after a brief description of what the role entailed by the meeting facilitator (NP). The NP student was responsible for presenting the meeting agenda, stating the goal of the conference, involving the other students by utilizing their chosen meeting roles, and guiding the participants to arrive at a prioritized action plan.

### Evaluation

Using the Interprofessional Competency Domains (ICDs; Interprofessional Education Collaborative Expert Panel, 2011), an evaluation survey was developed which included 14 Likert-scaled, five open-ended, and demographic questions. Interprofessional competency attainment was evaluated in the following four domains: (a) Values and Ethics; (b) Roles and Responsibilities; (c) Interprofessional Communication; (d) Teams and Teamwork. Interprofessional competency was therefore



**Figure 1** Interview questions and Mrs. Kim's reply.

**Table 1** Students' rating of their perceived attainment of interprofessional domain competencies for this activity

	Values/ethics	Roles/ responsibilities for interprofessional practice	Interprofessional communication	Teams/ teamwork
Strongly agree	72%	70%	66%	65%
Agree	27%	26%	33%	30%
Neither agree or disagree	1%	3%	1%	4%
Disagree	0%	1%	<1%	1%
Strongly disagree	0%	<1%	0%	0%

defined for this study as the student's agreement with a competency statement evaluating the student or group's performance during the video conference. For example, "All members of the team effectively communicated their role and responsibility to the team" was a statement categorized in the roles and responsibilities domain. The survey was developed using the competency domains and then reviewed by the participating faculty in each discipline to provide content validity. Reliability of the survey instrument was not established. This study received approval from the university's institutional review board and a consenting statement was provided for and read by participants prior to survey completion.

## Hypotheses

A virtual clinic with video conferencing was used for teaching interprofessional practice when caring for the elderly with students from eight healthcare professions. The following research questions were asked: Is this pedagogy perceived as effective by the students in the ICDs? Is the distribution of students' responses significantly associated

with ICDs? And is the distribution of students' responses significantly associated with discipline?

## Analyses

For quantitative data, descriptive statistics were used in the aggregate for all students by discipline and by ICDs. Differences between disciplines were compared using Fisher's exact test. A qualitative thematic analysis was performed on students' comments.

## Results

Demographics for all participating students ( $n = 71$ ) included: 76% female; age range of 21–61 years with the mean of 26; 90% Caucasian and 10% Asian. Students from the following disciplines participated: NP 11% ( $n = 8$ ), Pharmacy 14% ( $n = 10$ ), Nutrition 11% ( $n = 8$ ), Medicine 10% ( $n = 7$ ), Physical Therapy 11% ( $n = 8$ ), Social Work 14% ( $n = 10$ ), Exercise Science 12% ( $n = 9$ ), and Communication Sciences 16% ( $n = 11$ ).

Data from 14 Likert-scale questions were aggregated in the four interprofessional competency areas.

**Table 2** Qualitative summary of open-ended questions

Theme and percentage of response	Example quotation
Was the virtual clinic interview(s) a valuable experience? Why or why not?	
Valued working with other disciplines (56%)	"Yes. I thought it was very interesting and relevant to have all the care providers there to discuss different aspects of her care. It was helpful to get a better understanding of the medical perspective of her care while also making sure that Mrs. Kim was being respected and valued."
Video conferencing (15%)	
Interview questions (5%)	
Activity has value (14%)	
Negative comments about the virtual clinic (16%)	"No, I did not like that you could only ask certain questions, there was more I wanted to ask her."
Please comment on what worked well for you in the virtual clinic.	
Video conferencing (28%)	"I liked that I could use my own computer and phone from home and that I could revisit the clinic online anytime I wanted to." "Able to facilitate discussion among many participants in a constructive way." "Everybody was allowed to speak their mind and good ideas were shared." "The software worked very well and the flow of the character was good and convincing."
Discussion (28%)	
Facilitator (7%)	
Other disciplines (19%)	
Schedule (3%)	
Web-based clinic (18%)	
Was the Ready Talk video conference experience valuable? Why or why not?	
Yes (77%)	"Yes it was! Hopefully the health care system will incorporate this sort of interprofessional sharing/problem solving more which will enhance outcomes and patient lives." "Yes, it was very hard to hear others at times and there were various technical problems." "We could have achieved the same end using avatars and typing."
Mixed opinion (15%)	
No (6%)	
How could the virtual clinic be structured differently in order to better help you learn?	
Nothing/do not know (25%)	"I'm not sure." "I think it went really well. I wish we could have seen everyone at once." "Meet the team in person, it will build relationships as future providers." "I would go back and try out the interviews from other disciplines to see what they look for in patient interviews. It's good that this is an option." "Allow different question possibilities that follow a different route." "It would be helpful to know which discipline each person was representing and their role prior to the meeting since we were all meeting for the first time." "If there were voice recognition software or if there was a scribe to type the conversation in a chat section that was visible to all." "Leading with the medical major would be most beneficial."
Video conference format (6%)	
Meet in person (8%)	
Positive comments about virtual clinic (18%)	
Negative comments about virtual clinic (19%)	
Preparation (10%)	
Additional features (6%)	
Format of discussion (4%)	

Participants rated the value of this activity positively across all four domains (mean rating of 57% "Strongly Agree," 39% "Agree," and 5% "Neutral"). The distribution of responses was significantly associated with ICD ( $p = .002$ ). The role/responsibility domain had a lower percentage of "Strongly Agree" and higher percentage of "Agree" responses than other domains (see Table 1).

The distribution of responses was also significantly associated with discipline ( $p < .001$ ). In particular, the SLP, RD, and PT groups had a lower percentage of "Strongly Agree" and higher percentage of "Agree" responses than other groups. Also, the SLP and SW groups had a higher percentage of "Neutral" responses than other groups. Thematic analysis of open-ended questions indicated the educational value of the experience as summarized by the responses seen in Table 2.

## Discussion

This study demonstrated that a virtual clinic and video conferencing can be used to simplify IPE logistics and was an acceptable learning platform for most students. Faculty from each discipline utilized different strategies for including this activity in their course (volunteer to full class participation), which may be reflected in some difference in the distribution of student responses. Because all curriculums are packed with content, faculty must decide their own methods of including IPE activities, and the coordinator of this type of activity must be respectful of that. Video conferencing in the evening and round the clock availability of the IPE module and virtual clinic were good solutions.

The roles and responsibility competency domain is perhaps the hardest for students to grasp as novices who are

trying to master their own skills. This probably reflects their unfamiliarity with the responsibilities of other professionals and confusion over role overlap. In a 90-min video conference, role confusion might have emerged and might not have been resolved in that short experience. One medical student commented to the group, "I never thought about what my role would be in a group like this." This might indicate that continued exposure to other healthcare professionals is vital to future working relationships.

The experience of facilitating a meeting is an important curricular addition if interprofessional practice is an expectation of the future. The NP is one choice for meeting facilitator, but this task certainly can be shared if room is created in coursework of other disciplines. Most of the NP student facilitators were confident graduate students and experienced registered nurses, but this experience, particularly with the newest of the video conferencing format, placed all students in the novice role (Benner, 1984). Since the Affordable Care Act of 2010 (ACA) has created incentives for testing new models of care delivery in which providers are accountable for outcomes of care, experts in interprofessional teaming will be vital. Unlike traditional fee-for-service models, payment reform will hold providers accountable for either (a) the outcomes of care or (b) the outcomes and cost of care. This increased accountability creates an imperative to educate the NP to work effectively within an interprofessional team and also test models of delivering this educational content.

As with many educational research studies, this study clearly has limitations and generalization is not possible, but replication is encouraged. The study was conducted in one small rural state with only two participating institutions. The participants' mean age was 26 years, and acceptance of virtual learning might be different with older students. Ethnic and racial diversity of students was also limited. There were also several differences in the recruitment of participants as medical students were volunteers and other students participated as part of a course requirement creating possible bias. It should be noted that both graduate students (MD, NP, PT, Pharm, SLP, and RD) and undergraduate students (SW and ES) participated, and this mix could have influenced the students' perceptions of the interprofessional competencies. A pretest/posttest design might have identified these differences as well as providing a better measure of attainment of competency relative to the activity. The faculty did not conduct an observational study of attainment of competency but rather relied on students' own evaluation of competency attainment during this activity as measured by survey response. Further research might include the following: observational studies of video conferences, comparisons of cost of utilizing online technologies versus hosting large groups of students for interprofessional discussions, and qualitative analysis

of students experience with the type of IPE. Because IPE has been endorsed as essential by the accreditors of most health professional programs, one can hope that the costs, logical demands, and research for evidence-based IPE can be spread across the disciplines.

## Conclusion

The NP students highly valued the opportunity to interact with other students and learn about their roles and perspective. In order to prepare healthcare professionals of the future, it is imperative to design IPE activities, teach meeting facilitation and meeting roles, cultivate opportunities to observe real teams in practice, and research effectiveness. As healthcare financing transitions from fee-for-service to outcomes-based reimbursement, the NP must have knowledge of the unique contributions of other team members and the skill to facilitate care planning meetings that will improve care outcomes. Utilizing distance technology for this type of meeting might prove to be a care innovation in which NPs can play a significant role, if exposed to this pedagogy in their educational program.

## Acknowledgments

Funding from HRSA Advanced Nursing Education grant # D09HP25918-01-00. Research assistance from Darcy Bennett MSN, APRN.

Collaborative efforts from faculty/students of eight disciplines at the University of Vermont and Albany College of Pharmacy.

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work (Mary Val Palumbo, Jennie C. De Gagne, Gwendolyn Murphy); drafting the work or revising it critically for important intellectual content (Mary Val Palumbo, Jennie C. DeGagne); final approval of the version to be published (Mary Val Palumbo, Jennie C. DeGagne, Gwendolyn Murphy); agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved (Mary Val Palumbo, Jennie C. DeGagne, Gwendolyn Murphy).

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