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An interactive faculty development workshop designed to improve knowledge, skills (competence), attitudes, and practice in interprofessional continuing education

Kathy B. Chappell^a, Lawrence Sherman^b and Scott D. Barnett^c

^aAmerican Nurses Credentialing Center, Silver Spring, MD, USA; ^bAcademy for Global Interprofessional Learning and Education, Thonex, Switzerland; ^cDepartment of Cardiac Surgery, Cardiac Surgery Research, Inova Heart and Vascular Institute, Falls Church, VA, USA

ABSTRACT

Purpose: Interprofessional continuing education (IPCE) health care educators must plan activities as members of interprofessional teams and deliver activities to an interprofessional audience. Evidence in the literature suggests they are not well prepared to meet this challenge. This paper reviews one strategy to improve the knowledge, skills, attitudes, and practices of IPCE educators.

Methods: Seven faculty development workshops were conducted within the USA, Europe, Asia, and the Middle East. Approximately 250 learners participated in the workshops in total, with 107 in an IRB-approved research study.

Results: From the research cohorts demonstrated improved knowledge and skills over a 12-month period. Knowledge and skills scores increased most significantly from baseline to 3 months and remained above baseline at 6–12 months. The workshop was not an effective strategy to improve attitudes towards IPCE, though attitude scores were already high prior to participating.

Conclusions: All participants actively engaged in the workshops. There were no observed differences in engagement by geographic region, gender, age, or profession. Participants stated they were better able to understand the roles of other team members; perspectives of patients, families, and caregivers; and their own roles on clinical teams. Participants described gaining a new appreciation for the complexity of designing IPCE.

Introduction

Interprofessional education (IPE) has been proposed as a strategy to improve interprofessional collaborative practice (IPCP) among members of the health care team and, indirectly, as a strategy to improve patient care outcomes. IPE is defined by the World Health Organization as “when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes” (Interprofessional Education Collaborative Expert Panel 2011). IPCP is defined as “when multiple health workers from different professional backgrounds work together with patients, families, carers (*sic*), and communities to deliver the highest quality of care” (Interprofessional Education Collaborative Expert Panel 2011). These definitions relate primarily to the clinical practice setting in terms of patient care outcomes, but have important implications for health care educators in the field of interprofessional continuing education (IPCE).

Health care education, both in academic and continuing education settings, has historically been conducted in silos. Educational activities have traditionally been developed by single professions based on the learning needs of members of that profession. The work of thought leaders and researchers in organizations such as the World Health Organization, Institute of Medicine, the Josiah Macy Jr. Foundation, and the National Center for Interprofessional Practice and Education have challenged

Practice points

- Health care educators need to acquire skills to plan interprofessional educational activities.
- This workshop significantly improved faculty knowledge and skills for IPCE, however did not significantly improve attitudes or practices.
- Participants better understood the roles of team members, and patients', families', and caregivers' perspectives.
- Participants gained new appreciation for the complexity of designing IPCE to address clinical problems in practice.

the concept that profession-specific education will meet the needs of today's health care professional as a growing body of evidence has demonstrated the relationship between health care teams, IPCP, and positive patient outcomes (Reeves et al. 2016).

Responsibility for developing IPCE will then rest with health care educators. Health care educators, most of whom were taught in the traditional single profession model, will need to acquire the necessary skills to plan educational activities as members of an interprofessional team and deliver educational activities to an interprofessional audience. Health care educators will have to overcome issues related to professional hierarchies and learn how to

meet the diverse learning needs of members from multiple professions in a single target audience.

Within the academic setting, organizations such as the American Association of Colleges of Nursing, the Association of American Medical Colleges and the Accreditation Council of Pharmacy Education (ACPE) have embedded competencies related to IPE into their curriculum and expectations for faculty. In the practice setting, organizations responsible for residency and fellowship programs for health care professionals have also incorporated interprofessional competencies into their programs. Within the continuing education setting, organizations such as the Alliance for Continuing Education in the Health Professions (ACEHP) have developed competencies for health care educators that include an interprofessional focus. And, accrediting bodies such as the Accreditation Council for Continuing Medical Education, ACPE, and the American Nurses Credentialing Center have developed credentialing programs to accredit organizations providing IPCE. Together, these organizations are developing new approaches for educating health care practitioners from academia into the practice setting.

Traditional models of single profession health care education will no longer serve the needs of today's health care practitioner. Health care is delivered by interprofessional teams, and health care education will need to support practitioners to develop the knowledge, skills, attitudes, and behaviors related to being members of interprofessional teams. Health care educators must foster their own interprofessional skills in order to develop high quality, interprofessional educational activities designed to improve practitioners' knowledge, competence, performance, and patient outcomes. Evidence in the literature suggests that health care educators are currently not well prepared to meet this challenge and will need to engage in their own professional development activities if they are to function as interprofessional team members and educators.

Literature review

A review of published studies related to IPE, IPCE, and IPCP has suggested that some strategies to improve collaboration and teamwork are more effective than others in producing positive change. It is critical that health care educators responsible for developing IPE and IPCE are aware of the most current evidence and have an opportunity to develop the skills required to plan and provide high quality education that is designed to improve IPCP and patient outcomes.

Using the 3-P model developed by Biggs to classify evidence from a systematic review of the literature, Hammick and colleagues (2007) evaluated outcomes of IPE to better inform health care educators and to shape the future of IPE (Hammick et al. 2007). The classification scheme in the 3-P model included presage, process, and product factors. Presage factors included context of IPE, learner characteristics, and teacher characteristics. Process factors included facilitating interprofessional learning or curriculum design for adult learners. Product factors included positive learning outcomes for participants.

Drivers, or context, for IPE were generally the desire to improve patient outcomes or to improve teamwork. The most common top down drivers included government policy

and organizational need to reduce medical errors. The most common bottom-up drivers originated in the practice setting in an effort to improve team collaboration. Sufficient organizational resources and leadership support were noted as important presage factors. The majority of learners participating in IPE activities were positive about IPE, and one study noted that more mature and experienced learners were more favorable about IPE as compared to younger and less experienced learners. It was also noted that learners often have preexisting views about members of other professions prior to participating in an IPE activity, and exposing health care students to IPE early in their academic careers may mitigate some of the negative stereotypes (Barnsteiner et al. 2007; Hammick et al. 2007). One study found that female students had a more positive attitude towards IPE than male students (Hammick et al. 2007). Quality of faculty was one of the most important contributors to student satisfaction in IPE, and some research has demonstrated that faculty frequently felt unprepared to facilitate interprofessional groups of students (Hammick et al. 2007).

Researchers identified a variety of factors that impact the process of providing IPE activities. IPE activities are perceived as more successful by learners when faculty have the ability to work creatively with small groups and have a "legitimate" knowledge base of the profession, enabling them to conduct exercises like shared storytelling (Hammick et al. 2007). Other researchers have found that strategies such as using problem-based learning, case studies that are patient focused, and jointly learning skills through simulation are more likely to be effective in IPE (D'Eon 2005). Shadowing another health care professional and participating in IPE lectures or reading were not deemed successful strategies (Carlisle et al. 2004; D'Eon 2005). Incorporating joint reflection into interprofessional activities was noted as a successful strategy (Barnsteiner et al. 2007).

Hammick and colleagues (2007) classified outcomes related to IPE using a six-level evaluation model that was based on Kirkpatrick's original four-level evaluation model. Overall, more positive than negative or neutral outcomes related to IPE were reported though researchers noted that the lack of negative outcomes may also reflect a reporting bias in published literature. The majority of studies reported outcomes at the levels of reaction, perceptions and attitudes, and knowledge and skills. Few studies report higher level outcomes such as behavior change, service delivery, and patient care outcomes. Behavior change was most likely to be self-reported. Change in service delivery and patient care outcomes were more commonly related to interprofessional quality improvement initiatives and demonstrated positive outcomes.

A recent systematic review of the literature has provided a more detailed evaluation of the impact of IPE and IPCE on practice and patient outcomes. Reeves and colleagues' (2016) review revealed a significant increase in studies evaluating the relationship between post-licensure/post-certifying health care professionals' participation in IPCE and outcomes, from 2007 (29%; 6 of 21 studies) to 2016 (39%; 18 of 46 studies). The most common professions that share IPE/IPCE experiences are medicine and nursing (Reeves et al. 2016).

Evaluation designs of studies in the systematic review included action research, case study, ethnographic, experimental, and quasi-experimental. Studies were analyzed

using the same 3P model described previously to understand contextual factors, educational process, and associated outcomes (Reeves et al.). Using a modified Kirkpatrick evaluation framework, Reeves and colleagues (2016) also classified outcomes of studies into six different but nonhierarchical levels: Level 1 (Reaction), Level 2a (Modification of attitudes/perceptions), Level 2b (Acquisition of knowledge/skills), Level 3 (Behavior change), Level 4a (Change in organizational practice), and Level 4b (Benefits to patients/clients).

Presage factors that influenced development, sustainability, and outcomes of IPE/IPCE included contextual issues, teacher characteristics, and learner characteristics. Contextual issues that were cited included organizational resource support (time, space, finances); implementation of IPE/IPCE stemming from a desire to improve patient care or service delivery through improvement in IPC and teamwork; and leadership commitment from the top down and the bottom up (administrator and educator). Positive characteristics that were associated with faculty included creating a safe environment for learning, ensuring that learners had equal time for interacting and participating, and implementing strategies to minimize interprofessional friction. Characteristics of learners from the analysis included a positive attitude and willingness to participate, as well as having voluntarily chosen to participate in the educational activity.

Process factors that positively impacted the educational experience included: opportunity for reflection; deliberate coaching and mentoring learners (and faculty); customizing the educational activity to be an authentic experience; integrating informal learning opportunities; facilitated debriefing; and employing a theoretical approach to the educational design.

The products, or outcomes, of IPE/IPCE were predominantly positive. Studies generally reported more than one outcome. Studies involving health care professional students were more likely to report outcomes related to levels 1, 2a, or 2b. Studies involving practicing health care professionals were more often linked to levels 3, 4a, or 4b, supporting the distinction between strategies and outcomes used to develop and evaluate IPE and IPCE between students and practicing clinicians, respectively. Results from the studies included:

- Level 1: Reaction. Valued and supported the IPE experience; were satisfied with involvement; found the experience enjoyable and/or rewarding
- Level 2a: Modification of attitudes/perceptions. Positive attitude maintained over time; some studies reported positive attitudes initially, growing more negative over time
- Level 2b: Acquisition of knowledge/skills. Self-reported improvements in knowledge and skills; two studies validated change in skills by additional assessment
- Level 3: Behavioral change. Self-reported change in behavior; two studies validated change in behavior by additional assessment (ED teamwork and breaking bad news)
- Level 4a: Change in organizational practice. Improvements in service delivery (illness prevention, patient screening, safety practices)
- Level 4b: Benefit to patients/clients. Improvements in mortality rates, reduced clinical errors and patient length of

stay; improvements in patient clinical status (BP and cholesterol levels).

In summary, a building body of evidence supports a positive relationship between IPCE, IPCP, and positive patient outcomes. It is important then for health care educators in the practice setting develop the requisite skills to plan and present IPCE activities that are designed to improve IPCP.

Interactive faculty development workshops

Using evidence from previously referenced studies and best practices in adult education, an interprofessional, interactive faculty development workshop was designed to improve the knowledge, skills (competence), attitudes, and practices of faculty in IPCE. The workshop design incorporated several important theoretical and educational concepts: cognitive dissonance, reflection, role play and feedback, clinical relevance, and intergroup contact theory.

Prior to starting the workshop, facilitators described the format (role play, clinical problem in practice, debrief) and teaching strategies. Facilitators reassured participants that the simulated educational experience was a safe learning environment, and asked participants to be willing to engage and share their individual perspectives without fear of being criticized or judged by others.

Once questions had been answered and there was collective agreement and understanding as to the objectives of the workshop, participants were assigned to a unique role for the activity. Participants were deliberately assigned to a role that was different from the one they held professionally. For example, if the participant was a nurse, s/he might be assigned to the role of a social worker; or a physician might be assigned to the role of a patient. This strategy was designed to create cognitive dissonance and to provide an opportunity for the participant to reflect on how another member of the health care team might view a clinical problem. Workshop roles included: physicians, nurses, social workers, pharmacists, clinical technicians/patient care assistants, educators, students, patients, and family members.

Next, participants were given an opportunity to silently read and reflect on their assigned role. The roles included context that was unique and participants were asked to keep those contextual descriptions confidential, only sharing through the role-playing activity. The role context impacted how s/he might perceive the clinical problem. This strategy was used to demonstrate that there may be perception biases against other members of the health care team due to limited information or pre-established biases. For example, in one workshop, members of the health care team are perplexed as to why a patient's blood sugar levels were so labile, while the patient and family member are told that they have been sneaking in food after hours because the patient did not want the dietary meal that was ordered (see [Supplementary Appendix A](#)).

Then, participants were provided with a short clinical problem that was relevant to the local region. As this workshop has been presented globally, problems reflected, and were relevant to, the practice and health care settings in the United States, Europe, Asia, and the Middle East. Participants were asked to assess the problem(s) in practice

as an IPE planning team and develop an IPCE activity while role-playing the assigned professional role. In each workshop, one participant was assigned the role of a health care professional educator who had responsibility for developing the IPCE activity. Role playing and feedback helped increase transferability of learning into practice by giving participants an opportunity to practice skills in a safe learning environment. This portion of the workshop was also based on intergroup contact theory (Pettigrew et al. 2011). By asking the participants to work collaboratively with each other, applying the tenets of the theory (equal status of among group members, common goals, no intergroup competition, and authority sanction), prejudice among group members was reduced and the level of trust increased.

Facilitators conducted post-activity debriefing after approximately 1.5–2 hours. For early cohorts, pre-activity evaluations were collected as part of an IRB-approved research study with post-activity evaluation subsequently conducted at 3, 6 and 12 months using a researcher-developed survey instrument. Subsequent cohorts not included in the research study were not provided with the pre- and post-activity evaluations, however, did participate in post-activity debriefing, sharing, and reflection.

In each of the workshops, facilitators monitored the discussion to ensure that participants stayed on task, and did not deviate “back” into their own professional roles. Many participants strongly embraced their assigned roles, sometimes to the level of highly engaging role-playing. This enhanced the learning experience for other participants, as well as encouraged them to truly embrace their own assigned roles.

The role of educator was often the most challenging as s/he had to guide the other role-playing participants through the journey of identifying team-based educational needs and gaps from the clinical problem scenario, then work collaboratively to develop an educational strategy. Workshop participants often required guidance from the facilitators when categorizing gaps as being educational rather than gaps that reflected other problems such as system-based or environmental issues.

Results

From July 2015 to April 2018, facilitators conducted seven workshops (United States = 2; Europe = 2; Asia = 1; Middle East = 2), with approximately 250 participants in total. From the first three cohorts (United States = 2, Europe = 1), 107 (53%; $N = 203$) learners consented to participate in an IRB-approved research study. The majority of research study participants were female (89.7%), Caucasian (84.1%), nurses (73.8%), and held a master or doctoral degree (67.3%) (Table 1).

Study participants completed a consent form and pre-activity survey prior to the start of the workshop. The survey instrument was developed by the first author (KC), and included a total of 12 items measuring three domains (knowledge, skills (competence), and attitudes), with four items per domain. Domain items were ranked on a 6-point scale from 1 = strongly disagree to 6 = strongly agree. In addition, the survey instrument included two items evaluating practice. One practice item was a self-report measure of

Table 1. Demographics.

Parameter	Pre-testing	
	<i>N</i>	%
Gender		
F	96	89.7
M	11	10.3
Race (recoded)		
Asian	6	5.6
Black	3	2.8
Hispanic	4	3.7
Other	4	3.7
White	90	84.1
Profession		
Medicine	4	3.7
Nursing	79	73.8
Other*	24	22.4
Education		
Missing	16	15.0
HS	1	0.9
BA/Diploma	18	16.9
Doctoral	18	16.8
Masters	54	50.5

Values are frequency and percent or mean \pm SD, where appropriate.

*Other values included association manager ($n = 1$), consultant/educator ($n = 1$), education specialist ($n = 1$), etc.

the number of educational activities planned during the previous 6 months, and the other item was a self-report measure of the number of IPCE activities as a subset of the overall number (Table 2). Study participants were subsequently sent the same survey instrument post-activity at 3, 6 and 12 months. Response rates were 44% ($N = 47$) and 45% ($N = 48$) at 3 and 6 months, respectively. The response rate at 12 months was 6% ($N = 6$) (Table 3).

Individual mean scores for each domain were compared from baseline to 12 months using non-parametric Kruskal–Wallace tests. We observed a statistically significant improvement from baseline to 12 months for the domains of knowledge ($p < 0.0001$) and skills ($p < 0.0001$). There was no statistically significant difference in attitude from baseline to 12 months ($p = 0.4531$), though attitude scores were high at baseline. There was no statistically significant difference in the number of IPCE activities planned from baseline to 12 months ($p = 0.4282$) (Table 4).

Qualitative feedback collected immediately post-activity during the debriefing session was overwhelmingly positive. All participants actively engaged in the workshops and participated in the role-play. There were no observed differences in participant engagement by geographic region, gender, age, or profession. Participants stated that they were better able to understand the roles of other team members, and the perspectives of patients, families, and caregivers after participating in the workshop. Some participants also acknowledged gaining a better understanding of their own roles on clinical teams. Participants described gaining a new appreciation for the complexity of designing IPCE to address clinical problems in practice, including how their own professional perspective might be limited when all members of the health care team are not included in planning. Although not designed to impact the clinical practice of the participants, there were some interesting findings beyond IPCE faculty development. Some participants described feelings of cognitive dissonance as they reflected on their own practice and identified opportunities for improvement. In some instances, the clinical problem generated personal discomfort as in one persona of a mother with MS and two young children, which was

Table 2. Item frequency distribution by survey period.

Survey item	Survey period							
	Pre-test		3 months		6 months		12 months	
	N	%	N	%	N	%	N	%
Q1. I know the definition of IPCE								
Missing	0	0.0	2	4.1	2	4.0	0	0.0
Moderately Disagree	0	0.0	1	2.0	1	2.0	0	0.0
Mildly Disagree	1	0.9	0	0.0	0	0.0	0	0.0
Mildly Agree	14	13.1	2	4.1	1	2.0	0	0.0
Moderately Agree	44	41.1	13	26.5	8	16.0	2	33.3
Strongly Agree	48	44.9	31	63.3	38	76.0	4	66.7
Q2. I am familiar with the IP competencies								
Missing	–	0	2	4.1	2	4.0	0	0.0
Strongly Disagree	1	0.9	0	0	0	0.0	0	0.0
Moderately Disagree	9	8.4	1	2	0	0.0	0	0.0
Mildly Disagree	11	10.3	2	4.1	1	2.0	1	16.7
Mildly Agree	38	35.5	10	20.4	13	26.0	2	33.3
Moderately Agree	31	29	21	42.9	21	42.0	2	33.3
Strongly Agree	17	15.9	13	26.5	13	26.0	1	16.7
Q3. I can identify when an IPCE activity is appropriate								
Missing	1	0.9	2	4.1	2	4.0	0	0.0
Strongly Disagree	0	0.0	1	2	0	0.0	0	0.0
Moderately Disagree	3	2.8	0	0.0	0	0.0	0	0.0
Mildly Disagree	6	5.6	0	0.0	1	2.0	0	0.0
Mildly Agree	27	25.2	4	8.2	2	4.0	1	16.7
Moderately Agree	45	42.1	19	38.8	23	46.0	3	50.0
Strongly Agree	25	23.4	23	46.9	22	44.0	2	33.3
Q4. I can list possible barriers to implementing IPCE in my practice setting								
Missing	1	0.9	2	4.1	3	6.0	0	0.0
Strongly Disagree	0	0.0	1	2	0	0.0	0	0.0
Mildly Disagree	3	2.8	0	0.0	0	0.0	0	0.0
Mildly Agree	18	16.8	4	8.2	3	6.0	2	33.3
Moderately Agree	55	51.4	21	42.9	21	42.0	0	0.0
Strongly Agree	30	28	21	42.9	23	46.0	4	66.7
Q5. I am able to design IPCE activities								
Missing	0	0.0	2	4.1	2	4.0	0	0.0
Strongly Disagree	1	0.9	0	0.0	0	0.0	0	0.0
Moderately Disagree	8	7.5	1	2	1	2.0	0	0.0
Mildly Disagree	8	7.5	4	8.2	3	6.0	0	0.0
Mildly Agree	47	43.9	6	12.2	8	16.0	0	0.0
Moderately Agree	33	30.8	21	42.9	21	42.0	5	83.3
Strongly Agree	10	9.3	15	30.6	15	30.0	1	16.7
Q6. I am able to facilitate a group of IP learners								
Missing	0	0.0	2	4.1	2	4.0	0	0.0
Strongly Disagree	1	0.9	0	0.0	0	0.0	0	0.0
Moderately Disagree	4	3.7	2	4.1	0	0.0	0	0.0
Mildly Disagree	13	12.1	2	4.1	2	4.0	0	0.0
Mildly Agree	37	34.6	12	24.5	12	24.0	1	16.7
Moderately Agree	40	37.4	19	38.8	18	36.0	2	33.3
Strongly Agree	12	11.2	12	24.5	16	32.0	3	50.0
Q7. I am able to work collaboratively as a member of an IP planning team								
Missing	2	1.9	2	4.1	2	4.0	0	0.0
Strongly Disagree	0	0.0	1	2.0	0	0.0	0	0.0
Moderately Disagree	2	1.9	0	0.0	0	0.0	0	0.0
Mildly Disagree	1	0.9	1	2.0	0	0.0	0	0.0
Mildly Agree	19	17.8	1	2.0	3	6.0	1	16.7
Moderately Agree	45	42.1	15	30.6	11	22.0	0	0.0
Strongly Agree	38	35.5	29	59.2	34	68.0	5	83.3
Q8. I am able to incorporate the patient's perspective in planning IPCE								
Missing	2	1.9	3	6.1	2	4.0	0	0.0
Moderately Disagree	5	4.7	0	0.0	0	0.0	0	0.0
Mildly Disagree	4	3.7	1	2.0	1	2.0	0	0.0
Mildly Agree	31	29	3	6.1	6	12.0	4	66.7
Moderately Agree	40	37.4	21	42.9	22	44.0	2	33.3
Strongly Agree	25	23.4	21	42.9	19	38.0	0	0.0
Q9. I believe IPCE is important for improving team performance								
Missing	0	0.0	2	4.1	2	4.0	0	0.0
Strongly Disagree	0	0.0	1	2.0	0	0.0	0	0.0
Mildly Agree	3	2.8	2	4.1	3	6.0	1	16.7
Moderately Agree	17	15.9	8	16.3	7	14.0	1	16.7
Strongly Agree	87	81.3	36	73.5	38	76.0	4	66.7
Q10. I believe IPCE can have a positive impact on patient outcomes								
Missing	0	0.0	2	4.1	2	4.0	0	0.0
Strongly Disagree	0	0.0	1	2.0	0	0.0	0	0.0
Mildly Agree	2	1.9	0	0.0	1	2.0	1	16.7
Moderately Agree	13	12.1	5	10.2	6	12.0	0	0.0
Strongly Agree	92	86.0	41	83.7	41	82.0	5	83.3
Q11. I believe IPCE is too difficult to implement								
Missing	0	0.0	2	4.1	2	4.0	0	0.0
Strongly Disagree	6	5.6	2	4.1	2	4.0	0	0.0
Moderately Disagree	8	7.5	3	6.1	4	8.0	0	0.0

(Continued)

Table 2. Continued.

Survey item	Survey period							
	Pre-test		3 months		6 months		12 months	
	N	%	N	%	N	%	N	%
Mildly Disagree	16	15.0	5	10.2	2	4.0	1	16.7
Mildly Agree	31	29.0	9	18.4	10	20.0	0	0.0
Moderately Agree	27	25.2	14	28.6	20	40.0	4	66.7
Strongly Agree	19	17.8	14	28.6	10	20.0	1	16.7
Q12. I would welcome the opportunity to be a member of an IP planning team								
Missing	2	1.9	2	4.1	2	4.0	0	0.0
Strongly Disagree	0	0.0	2	4.1	0	0.0	0	0.0
Moderately Disagree	1	0.9	0	0.0	0	0.0	0	0.0
Mildly Agree	7	6.5	2	4.1	3	6.0	1	16.7
Moderately Agree	29	27.1	12	24.5	12	24.0	1	16.7
Strongly Agree	68	63.6	31	63.3	33	66.0	4	66.7
I have been a member of an IP planning team								
Missing	1	0.9	3	6.1	2	4.0	0	0.0
Yes	74	69.2	40	81.6	39	78.0	3	50.0
No	32	29.9	6	12.2	9	18.0	3	50.0
I have been a presenter within an IPCE activity								
Missing	1	0.9	3	6.1	2	4.0	0	0.0
Yes	32	29.9	12	24.5	17	34.0	2	33.3
No	74	69.1	34	69.4	31	62.0	4	66.7

IPCE: interprofessional continuing education; IP: interprofessional.

Table 3. Frequency distribution of participants reporting a “moderately agree” or “strongly agree” response.

Survey item	Survey period							
	Pre-test		3 months		6 months		12 months	
	N	%	N	%	N	%	N	%
Q1. I know the definition of IPCE	15	14.0	5	10.2	4	8.0	0	0.0
Q2. I am familiar with the IP competencies	59	55.1	15	30.6	16	32.0	3	50.0
Q3. I can identify when an IPCE activity is appropriate	37	34.6	7	14.3	5	10.0	1	16.7
Q4. I can list possible barriers to implementing IPCE in my practice setting	22	20.6	7	14.3	6	12.0	2	33.3
Q5. I am able to design IPCE activities	64	59.8	13	26.5	14	28.0	0	0.0
Q6. I am able to facilitate a group of IP learners	55	51.4	18	36.7	16	32.0	1	16.7
Q7. I am able to work collaboratively as a member of an IP planning team	24	22.4	5	10.2	5	10.0	1	16.7
Q8. I am able to incorporate the patient’s perspective in planning IPCE	42	39.3	7	14.3	9	18.0	4	66.7
Q9. I believe IPCE is important for improving team performance	3	2.8	5	10.2	5	10.0	1	16.7
Q10. I believe IPCE can have a positive impact on patient outcomes	2	1.9	3	6.1	3	6.0	1	16.7
Q11. I believe IPCE is too difficult to implement	93	86.9	44	89.8	44	88.0	6	100
Q12. I would welcome the opportunity to be a member of an IP planning team	10	9.3	6	12.2	5	10.0	1	16.7

IPCE: interprofessional continuing education; IP: interprofessional.

randomly assigned to a female participant who happened to also have two small children.

Discussion

This interprofessional, interactive faculty development workshop was an effective strategy to engage health care professional educators and clinicians in evaluating clinical problems in practice and developing IPCE activities to improve IPCP. Based on evidence in the literature, presage and process factors that enhance the learning experience include: creating a safe environment; ensuring learners have equal time for interacting and participating; implementing strategies to minimize interprofessional friction; including opportunity for reflection; providing deliberate coaching and mentoring; customizing the educational activity to be an authentic experience; facilitating debriefing; and employing a theoretical approach to the educational design. This workshop incorporated those factors.

Results from the research cohorts demonstrated that this workshop improved knowledge and skills (competence) for faculty in IPCE over a 12-month period. Knowledge and skills (competence) scores increased most significantly from

baseline to 3 months and remained above baseline at 6–12 months. The workshop was not an effective strategy to improve attitudes towards IPCE in these cohorts, though attitude scores were already high prior to participating in the workshop. This may be because participants who self-selected to participate already had positive attitudes about IPCE. The workshop was also not effective at increasing practices as defined by the number of IPCE activities planned and evaluated in the previous 6 months. This may be because this workshop was not an effective strategy to improve practice, although a number of participants asked to replicate the workshop in their own practice settings suggesting that the format was positively received. Other reasons that participants in this study may not have demonstrated an increase the number of IPCE activities include a lack of opportunity or support in individual practice settings to develop IPCE, or participants who developed IPCE, however, did not participate in the post-activity 12-month survey.

This workshop design was effective at engaging members from different professions, across cultures, and in multiple geographic regions. The time allocated for the workshop (2 hours) was often too short as participants wanted to continue collaborative discussions well beyond

Table 4. Item means by survey period.

Item	Survey response period												p
	Pre-test (n = 107)		3 months (n = 47)		6 months (N = 48)		12 months (N = 6)		Chi-square	SD	Mean	SD	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD					
Q1. I know the definition of IPCE	5.3	0.7	5.6	0.8	5.7	0.7	5.7	0.5	17.719	0.0005			
Q2. I am familiar with the IP competencies	4.3	1.2	4.9	0.9	5	0.8	4.5	1.0	16.037	0.0011			
Q3. I can identify when an IPCE activity is appropriate	4.8	1.0	5.3	0.9	5.4	0.7	5.2	0.8	21.345	<0.0001			
Q4. I can list possible barriers to implementing IPCE in my practice setting	5.1	0.8	5.3	0.9	5.4	0.6	5.3	1.0	9.955	0.0189			
Q5. I am able to design IPCE activities	4.2	1.0	5	1.0	5.0	1.0	5.2	0.4	28.769	<0.0001			
Q6. I am able to facilitate a group of IP learners	4.4	1.0	4.8	1.0	5.0	0.9	5.3	0.8	17.194	0.0006			
Q7. I am able to work collaboratively as a member of an IP planning team	5.1	0.9	5.5	0.9	5.6	0.6	5.7	0.8	21.632	<0.0001			
Q8. I am able to incorporate the patient's perspective in planning IPCE	4.7	1.0	5.3	0.7	5.2	0.8	4.3	0.5	22.341	<0.0001			
Q9. I believe IPCE is important for improving team performance	5.8	0.5	5.6	0.9	5.7	0.6	5.5	0.8	1.353	0.7165			
Q10. I believe IPCE can have a positive impact on patient outcomes	5.8	0.4	5.8	0.8	5.8	0.4	5.7	0.8	0.167	0.9827			
Q11. I believe IPCE is too difficult to implement	4.1	1.4	4.5	1.4	4.5	1.3	4.8	1.0	5.739	0.125			
Q12. I would welcome the opportunity to be a member of an IP planning team	5.6	0.7	5.4	1.1	5.6	0.6	5.5	0.8	0.271	0.9654			
Approx., how many educational activities have you planned over the past 6 months?	15.1	26.0	17.6	33.0	25.1	43.6	9.3	6.7	0.801	0.8492			
How many educational activities listed above were IPCE activities?	4.3	10.5	6.4	21.5	6.5	16.4	1.0	1.1	2.772	0.4282			
Knowledge	19.4	3	21.1	3.1	21.4	2.1	20.7	2.5	25.215	<0.0001			
Skills	18.3	3.3	20.4	3.4	20.8	2.7	20.5	1.6	30.883	<0.0001			
Attitudes	21.2	2.2	21.4	2.8	21.7	2.0	21.5	3.2	2.625	0.4531			

Chi-squares and p values are the result of non-parametric Kruskal–Wallace tests.

the conclusion. The use of role-play with context specific roles was also effective as participants discussed the clinical problem. What was initially perceived as a simple clinical problem by some quickly evolved as participant roles were revealed. Throughout the workshops, participants demonstrated respect for each other as equal and important contributors.

Conclusions

In IPCE, learners from multiple professions have the opportunity to learn from, with, and about each other. This workshop was successful at engaging interprofessional faculty who are interested in IPCE to improve knowledge and skills (competence) in the field. It is hoped that participants will carry that learning forward to design IPCE activities in their individual practice settings that have a positive impact on IPCP. It is also hoped that the workshop will have a positive impact on faculty who are also practicing clinicians.

Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Notes on contributors

Kathy B. Chappell, PhD, RN, FNAP, FAAN, is Senior Vice President at the American Nurses Credentialing Center. She is responsible for accreditation of continuing nursing education, interprofessional education, and nurse residency and fellowship programs. She is also responsible for the certification, measurement services, research, and quality departments.

Lawrence Sherman, FACEHP, CHCP, is Senior Vice President, Strategic Education at AGILE (Academy for Global Interprofessional Learning and Education), a Swiss-based global provider of interprofessional continuing education (IPCE). AGILE is responsible for designing, developing, implementing, and evaluating IPCE worldwide.

Scott D. Barnett, PhD, MSPH, is Manager of Epidemiology and Biostatistics for the Department of Cardiac Research at the Inova Heart and Vascular Institute. Dr Barnett received the 2013 Elizabeth and Sidney Licht Award for Excellence in Scientific Writing by the ACRM, and the 2014 Association of American Physiatrists Excellence in Research Writing Award.

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