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Learning Together: Interprofessional Education at the University of New England

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Context: Patient care delivered by well-functioning teams provides integrated and cohesive responses to the patients' needs and is considered more effective than care delivered by independent health professionals. The University of New England (UNE) College of Osteopathic Medicine integrates interprofessional education (IPE) curriculum into each year of its program. The UNE Center for Excellence in Collaborative Education coordinates strategically planned interprofessional learning opportunities.

Objective: To assess the implementation of interprofessional competencies and learning outcomes using the Interprofessional Team Immersion (IPTI) at UNE.

Methods: A team of students from various health profession programs worked on a simulated case with trained actors to learn about the roles and responsibilities of their professions in the optional IPTI. Pre- and postsurveys used the Interprofessional Core Competencies Assessment Scale (ICCAS) and the Interprofessional Socialization and Valuing Scale (ISVS) to evaluate student outcomes.

Results: Fifty-five students from various health profession programs at UNE participated in the IPTI activity in February/March 2018. Forty-four students (80%) responded to the surveys, and 43 (78%) completed both surveys. The mean (SD) total ICCAS score increased from presurvey (122 [27]) to postsurvey (127 [26]) ($P=.018$). The ISVS mean total scores increased from 48.3 presurvey to 57.9 postsurvey ($P<.0001$).

Conclusion: The significant differences in the ICCAS and the ISVS scores indicate that the IPTI changed students' attitudes toward IPE and future collaborative practice. Interprofessional learning at UNE is a valuable experience for both students and faculty. UNE College of Osteopathic Medicine continues to develop IPE activities for all 4 years of its programming.

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The Center for Excellence in Collaborative Education, University of New England's (UNE) interprofessional education (IPE) hub, brings students together from osteopathic medicine, dentistry, pharmacy, nursing, physical therapy, occupational therapy, social work, physician assistant, nurse anesthesia, public health, dental hygiene, exercise science, and athletic training. UNE's focus on health includes cross-professional exchange and cultural and biodiverse perspectives.

Patient care delivered by well-functioning teams that provide integrated and cohesive responses for patients, families, and populations is more effective than care delivered by independent health care professionals.¹ Adverse consequences of poorly functioning teams include medical errors and inefficient, unsatisfactory, and diminished quality of patient care, which drives up costs.² Team-based competencies and IPE are essential to health professions education,³ and colleges of osteopathic medicine should capitalize on opportunities for collaborative learning with their colleagues in other health professions.⁴

Learning outcomes, competencies, and accreditation standards across health profession programs mandate that curricula include "knowledge and skills in teamwork, communication, health information systems, quality and process improvement, social determinants of health, and population health."⁵ Residencies and employers increasingly seek students graduating from programs that emphasize such skills.⁶

Despite IPE's growing support, debate continues about when and how much to expose students to interprofessional competencies and collaborative practice methods in their preclinical and clinical curricula. Historically, students learned teamwork skills and about the roles and responsibilities of other health professions through naturally occurring interactions in the clinic. Although applied knowledge in clinical settings can cement interprofessional learning, cross-professional interactions that are not intentionally designed may be haphazard in the clinical curriculum. These interactions may not occur in some settings,

may not include beneficial debriefing conversations and reflection, and may be influenced by biases, assumptions, and power dynamics that detract from learning about patient-centered care and team efficiency. Explicit preclinical exposure to and integration of interprofessional competencies and practices in health profession education is advised to prepare students for clinical education and workplace success.

Evolution of IPE at UNE

UNE's commitment to IPE began in 2000. The establishment of the IPE Collaborative (IPEC) in 2010 solidified its stake in IPE academic, clinical, and community-based practice education. UNE IPEC provides leadership for and facilitation of a continuum of evidence-based and theoretically informed collaborative programming across UNE and in clinical and community settings. Its mission aims to prepare future health professionals with contextual knowledge, intercultural proficiency, cultural humility, and readiness to participate as members and leaders of interprofessional clinical and community health and social care teams. UNE's cross-professional collegial and collaborative culture benefits faculty. Students observe and experience teamwork in the implicit curriculum, which they can then translate into their roles as health care and service providers and organizational leaders.

Competencies and Common Learning Outcomes

Collaborative learning curriculum and activities at UNE are guided by an integration of competencies and behaviors outlined in the Core Competencies for Interprofessional Collaborative Practice Reports issued by the US IPE Expert Panel,^{1,4} the Canadian Interprofessional Collaborative Framework,⁷ and the World Health Organization Framework for Action on IPE and Collaborative Practice,⁸ which states

(i)nterprofessional collaborative practice happens when multiple health workers from different professional backgrounds work together with patients, families, caregivers and communities to deliver the highest quality of care. It allows health workers to engage any individual whose skills can help achieve local health goals.

This definition served as a guidepost for the development of curricula and desired learning outcomes for UNE students across the learning continuum.

At UNE, the integration of US and Canadian interprofessional competencies with critical concepts of community, cultural, and public/population health strengthen IPE learning opportunities, readying students for real-world situations that they will encounter in clinical rotations and future practice. Students entering UNE are introduced to IPE competencies and case-based learning methods at orientation. IPE activities are scaffolded, meaning that students are longitudinally exposed to and participate in IPE activities through a developmental continuum of learning activities, including simulation- and community-based immersive activities. This article assesses the implementation of interprofessional competencies and learning outcomes using the Interprofessional Team Immersion (IPTI) at UNE.

Methods

This survey-based study used a nonexperimental design with a sample of students from 8 different health profession programs at UNE, including the UNE College of Osteopathic Medicine (UNECOM). Students completed a 4-session IPTI learning activity in 2018 and both pre- and postsurveys. The institutional review board at UNE reviewed this project on January 8th, 2016, and granted exemption status.

Study population

Students from 8 UNE programs participated in a 4-session IPTI (Figure 1). Students were divided into 8 teams of 8 students with a representative from each program on each team. Student teams were assigned at

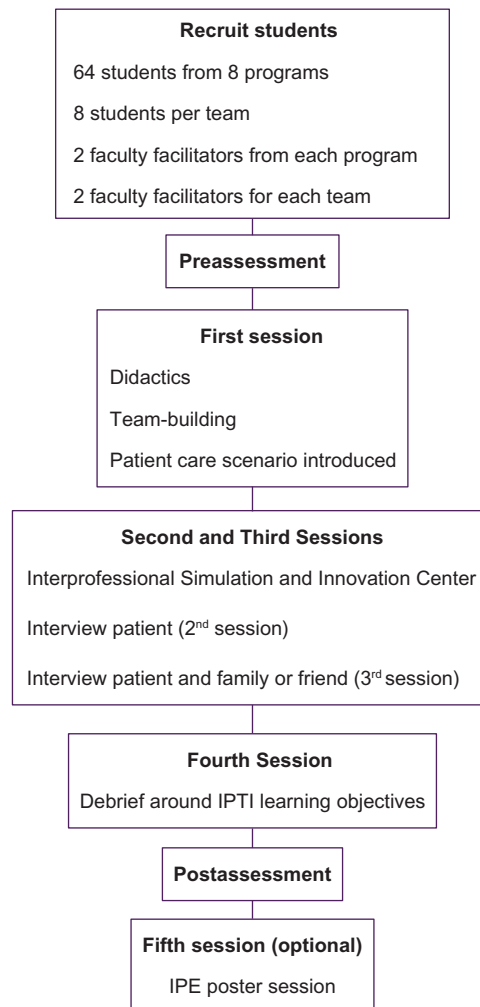


Figure 1.

Timeline of Interprofessional Team Immersion (IPTI) at the University of New England. Fifty-five students participated in the IPTI examined in this study. *Abbreviation:* IPE, interprofessional education.

least 2 faculty members to facilitate but not lead discussions.

Design

The IPTI began in 2014 as a pilot program designed to enhance students' application and demonstration of the core collaborative practice competencies. Case scenarios were constructed by interprofessional faculty teams to ensure that they were clinically sound and

relevant to a range of professions, roles, and health care settings. For example, a case may have included a difficult conversation about disability and sexuality, end-of-life decision-making, or health care for a patient who was homeless. The coconstructed IPTI design ensured that case-based learning (CBL) across disciplines was realistic, relevant, clinically accurate, relatable, complex, and purposeful. The IPTI goal was to demonstrate collaborative competencies through simulation, experiential activities, and case presentations, posters, or a written product.

CBL and community of practice learning models were used to design the IPTI experience. These theories underscore the importance of curiosity, critical thinking, and openness necessary to learn with and from each other.¹⁰ Trained actors performed the case-based simulations. The IPTI faculty worked together with the actors to make the simulated practice as realistic as possible.¹¹

The IPTI included 4 required and 1 optional session. The first session focused on didactics, team-building exercises, and introduction of the patient case scenario. The second session occurred in the Interprofessional Simulation and Innovation Center, and students decided which team members would interview the patient. In the third session, the team interviewed the patient and a family member/friend. The fourth session included a facilitated debriefing session designed around IPTI's learning objectives. In the fifth session, an optional poster session, students showcased what they learned during their IPTI experience.

Data Collection and Analysis

Both quantitative and qualitative data were collected through electronic pre- and postsurveys to measure students' self-reported attitudes and interprofessional competency-based knowledge/skills (**eAppendix 1** and **eAppendix 2**). Quantitative measures for the pre- and postsurvey were the Interprofessional Core Competencies Assessment Scale (ICCAS)¹² and the Interprofessional Socialization and Valuing Scale (ISVS).¹³ The ICCAS is based on the US and Canadian

IPEC Competencies, with subscales for communication, collaboration, roles and responsibilities, patient-centered approach, conflict management, and team functioning, and the total scores range from 20 to 140. The ISVS is a 9-question Likert-scale survey with 7 response options regarding attitudes and comfort of working interprofessionally, and the total scores range from 9 to 63.

Data were analyzed using SPSS software (IBM) that included descriptive statistics, normality tests, paired *t* tests, and related-samples Wilcoxon signed rank tests. The paired *t* test and Wilcoxon signed rank test were used to find individual student changes from pre- to postsurvey. Change scores consisted of the mean (SD) change of individual pre- and postchange scores. Qualitative questions in the survey included open-ended questions regarding the program's best aspects, any changes the students suggested, and the anticipated influence of participation in IPTI on future practice.

Results

Fifty-five students participated in the IPTI examined in this study. Pre- and postsurveys were completed and successfully paired for 43 students for a response rate of 78%. Response rates among specific professions ranged from a low of 50% for dental hygiene students to a high of 100% for nursing students (**Table 1**). Thirty-three respondents were women (77%) and 10 were men (23%). Twenty respondents were third-year students (46%), 12 were second-year students (28%), and 11 were first-year students (26%). Surveys were excluded on a case-by-case analysis. Three students skipped ICCAS items on pre- or postsurveys, and 1 student skipped an ISVS item on a presurvey.

The individual item and total ICCAS scores ($n=40$) revealed nonnormal distribution (skewed negative or left and positive kurtosis) of most individual scale items, subscale scores, and total scores (even with extreme outliers removed from analysis). Therefore, nonparametric methods were used to analyze changes from pre- to postsurveys in subscales and total scores. The results in **Table 2** indicate that ICCAS total scores

Table 1.
Response Rates of Students From Various Health Profession Programs Who Participated in the IPTI at UNE From February to March 2018 (N=55)

Health profession program	Total IPTI participants, No.	Participants who responded to linked pre- and postsurveys, No.	Response rate, %
Dental hygiene	4	2	50
Dental medicine	4	3	75
Nursing	12	12	100
Occupational therapy	6	5	83
Osteopathic medicine	5	4	80
Pharmacy	8	5	63
Physical therapy	5	3	60
Physician assistant	6	5	83
Social work	5	4	80
All programs	55	43	78

Abbreviations: IPTI, interprofessional team immersion; UNE, University of New England.

increased from a mean of 121 in the presurvey to 128 in the postsurvey. Related-samples Wilcoxon signed rank results indicated a statistically significant increase ($P=.018$). **Table 2** shows that ISVS total scores ($n=42$)

increased from a presurvey mean of 48.3 to a postsurvey mean of 57.9. Paired t test results indicated that this change was statistically significant ($P<.0001$). Qualitative results showed that UNECOM students found the IPTI experience to be beneficial (**Figure 2**).¹⁴

Table 2.
Total Scores From ICCAS and ISVS Pre- and Postsurveys of Students in Health Profession Programs at UNECOM Who Participated in the IPTI in 2018 (N=55)

Survey	n	Mean	Median
ICCAS^a			
Presurvey	40	122.4	131
Postsurvey	40	127.3	137
ISVS^b			
Presurvey	42	48.2	50
Postsurvey	42	57.9	59

^a Related-samples Wilcoxon signed rank test, $P=.018$.

^b Paired t test, $t_{41}=-6.48$, $P<.0001$.

Abbreviations: ICCAS, Interprofessional Core Competencies Assessment Scale; IPTI, Interprofessional Team Immersion; ISVS, Interprofessional Socialization and Valuing Scale; UNECOM, University of New England College of Osteopathic Medicine.

Discussion

During the past decade, different models for introducing students to interprofessional learning and collaborative practice have been piloted and tested by UNE IPEC; some were discarded while others thrived. Since 2015, UNECOM has worked to ensure that students engage and actively integrate into UNE's IPE activities. IPTI has had continuous and scalable success. Grounded in CBL, IPTI provides experiential and didactic opportunities for both process and product learning outcomes commensurate with evidence-based and interprofessional theory tenets¹⁵⁻¹⁷ and collaborative competencies.^{1,4,7,8}

Findings from the current study suggested that students improved their abilities to communicate with students from other professions and better understood

Deepened understanding of the roles and contributions of other health care professionals

"[My favorite thing about IPTI was] learning about the other health care professionals and gaining insight into their perspectives and priorities.

I now have a more well-rounded understanding of all of the services available for our future patients."

Changing previous perceptions

"I did not feel really as though [any others] had a bias toward me as a DO [student], but instead were inquisitive about my nuanced function and I can say the same about my curiosity about other programs. Never feeling judged was nice."

Influence on future practice

"We communicated very well and could discuss similar topics and bring our unique perspectives to the table. It felt natural once we started and was very enjoyable. Why isn't all of health care like this?"

Figure 2.

Overview and comments from University of New England students regarding the Interprofessional Team Immersion (IPTI) and interprofessional education (IPE) benefits from their IPE experiences.¹⁴ *Abbreviation:* DO, doctor of osteopathic medicine.

each other's respective roles and responsibilities. The survey findings showed statistically significant effects on students' self-reported interprofessional knowledge, attitude, and skills from participation in IPTI. Students seemed appreciative of learning about the depth and scope of other disciplines and how their roles sometimes overlapped. Navigating leadership responsibilities was an area of observed challenge; however, students gained respect for the collaborative enterprise because it served the greater needs of the patient.

Increasing IPE programming to ensure that all students have opportunities to be exposed to and demonstrate collaborative competencies in preclinical and clinical settings remains a challenge. Currently, some UNE programs build IPE into their curricula; others require attendance at certain activities or provide students with a menu of IPE options to earn an interprofessional honors distinction. IPE developers look to find novel curricular methods to embed IPE into existing UNECOM curricula, for example, in shared, asynchronous CBL. A further obstacle is ensuring that all

faculty are trained in interprofessional competencies and facilitation skills. Students take the lead from their respective faculty and model their views and actions. Thus, the teaching process is as important, if not more so, than the content and must align with IPE project aims. A considerable challenge still faced is sufficient allotment of faculty time and resources to develop and execute IPE learning activities.

An unintended, yet highly beneficial consequence of IPTI and IPEC at UNE is the camaraderie that has developed among the faculty across programs. These relationships have contributed to inventive programming; for example, asynchronous IPE learning whereby UNECOM and other health professions students share a case and are required by assignment to learn from each other. Mutual investment in IPE has helped build a robust core collective of faculty, professional staff, students, and administrators who work together to implement and prioritize appropriate training and engagement in IPE initiatives.

The limitations of this study included that the competency assessments relied on students' self-report,

and the study lacked a control or comparison group. Additionally, this study focused on only 1 college of osteopathic medicine and short-term outcomes. Future research could include additional IPE programs and measure the effect 6 to 12 months after the experience.

Conclusion

Deliberate curricular and cocurricular infusion of interprofessional interactions in the preclinical years provides osteopathic medical students and their peers from other health profession programs with essential tools to understand and practice in today's complex health care environment. Experiences such as IPTI offer students opportunities to learn about the intricacies of interprofessional health care teams and teach teamwork skills for clinical rotations. We have shown that IPTI has changed students' perceptions of IPE and expanded their knowledge of other health care professionals' roles and responsibilities. We propose the integration of interprofessional, interdisciplinary, and collaborative learning across program curricula.

Author Contributions

All authors provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; all authors drafted the article or revised it critically for important intellectual content; all authors gave final approval of the version of the article to be published; and all authors agree 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

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