

A regional model of interprofessional education

Maria Olenick¹
Edward Foote¹
Patricia Vanston¹
John Szarek¹
Zachary Vaskalis¹
Mary Jane Dimattio²
Raymond A Smego Jr²

¹The Commonwealth Medical College, Scranton, PA, USA; Nesbitt College of Pharmacy and Nursing, Wilkes University, Wilkes-Barre, PA, USA;

²University of Scranton, Scranton, PA, USA

Abstract: This paper describes the innovative features of the first regional model of interprofessional education (IPE) in the US, developed by The Commonwealth Medical College, Scranton, PA, USA, as a new, independent, community-based medical school in northeastern Pennsylvania. Essential educational components include collaborative care seminars, interprofessional sessions, simulations, live web-based seminars and newly innovative virtual environment interactive exercises. All of these elements are being integrated into the curricula of 14 undergraduate and allied professional schools, and three graduate medical education programs located in the region. Activities incorporate simulation, standardized patients, student leadership, and faculty and student facilitation. As this new regional model of interprofessional education is fully implemented, its impact will be assessed using both quantitative and qualitative outcomes measurements. Appropriate ongoing modifications to the model will be made to ensure improvement and further applicability to collaborative learning.

Keywords: interprofessional education, regional model, medical education

Introduction

The Center for Advancement of Interprofessional Education¹ defines IPE as a teaching and learning process that fosters collaborative work between two or more professions. It occurs when students learn with, from, and about one another. IPE is a proven, beneficial approach to collaborative learning that is frequently promulgated but not always successfully implemented. Typically, IPE involves different health care professions within the confines of a single-site, academic health sciences center. Substantive participation in IPE among geographically distinct institutions poses additional obstacles and challenges. Herein, we describe a new regional model of IPE which brings together multiple and geographically disparate stakeholders including undergraduate pre-health and health professional programs, and postgraduate medical education programs, and which is applicable to other academic institutions with a distributive model of medical education.

Institutional background

The Commonwealth Medical College (TCMC), the United States' newest allopathic medical school, is a private, independent (ie, not part of a university structure), community-based medical school with three regional campuses in Scranton, Wilkes-Barre, and Williamsport, Pennsylvania. Its mission is to "educate aspiring physicians and scientists to serve society using a community-based, patient-centered, interprofessional and evidence-based model of education that is committed to inclusion,

Correspondence: Maria Olenick
Clinical Skills Center, 501 Vine St,
Scranton, PA 18509, USA
Tel +1 570 504 9076
Fax +1 570 504 9615
Email molenick@tcmedc.org

promotes discovery and utilizes innovative techniques". In northeastern Pennsylvania, health profession students complete their education and clinical training in the various hospitals, clinics and physicians' offices of the region. Despite their close proximity, these students and their parent institutions rarely participate in collaborative educational exercises. TCMC has begun to address this gap through the creation of the country's first regional model for IPE, the Northeast Pennsylvania (NEPA) Interprofessional Education Coalition (IPEC), a collaborative endeavor that involves 17 undergraduate, postgraduate and health profession institutions or programs spread out among several large counties in northeastern Pennsylvania² (Table 1). The following are numbers of regional programs and approximate annual participants in NEPA IPEC member institutions: Nursing (8 programs: Licensed Practical Nurse – 35 participants each; Registered Nurse – 40–50 each); nurse's aide (2 programs: 30–50 each); occupational therapy (3 programs: 30–50 each); physical therapy (3 programs: 30–50 each); physician assistant (4 programs: 30–50 each); pharmacy (1 program: 30–50); speech language pathology (1 program: 30–50); nutrition (1 program: 30); social work (2 programs: 30 each); health education (1 program: 30); emergency medical services (3 programs: 30–40 each); dental hygiene (1 program: 30); surgical technology (2 programs: 30 each); vascular technology (1 program: 20); diagnostic medical sonography (1 program: 30); echocardiography (1 program: 30); phlebotomy (1 program: 30); pharmacy technology (1 program: 30); respiratory therapy (1 program: 30); radiation technology (1 program: 30); medical imaging (1 program: 30); biomedical engineering (3 programs 30–40 each); counseling and human services (2 programs: 30 each); community health education (1 program: 20); exercise science (1 program: 20–30).

The implementation

The logistics of initially contacting and bringing together potential educational participants for IPE from within a 16-county area were daunting to consider. However, the widespread local publicity about the College and public awareness of the huge educational and health-related impact that TCMC would have on this region helped tremendously in facilitating our mission. Furthermore, there was strong support for the development of a medical school among institutions of higher learning in the region. One of the authors (MO) made direct telephone contact with these institutions and invited their participation on an IPE advisory council. The turnout at the first coalition meeting was sizeable, yet

Table 1 Northeastern Pennsylvania Interprofessional Education Coalition – The Commonwealth Medical College

Participating institution	Departments/programs
The Commonwealth Medical College	Medicine, family medicine
Misericordia University	Nursing, medical imaging, occupational therapy, physical therapy, speech language pathology
King's College	Physician assistant, psychology
Wilkes University	Nursing, pharmacy
Marywood University	Nursing, nutrition, physician assistant, social work, health and physical education
Lackawanna College	Emergency medical services, dental hygiene, surgical technology, nurse's aide, vascular technology, diagnostic medical sonography, echocardiography, physical therapy assistant, phlebotomy, pharmacy technology
Luzerne Community College	Nursing, respiratory therapy, emergency medical services, surgical technology, pre-pharmacy, pre-optometry, dental hygiene
Lycoming College	Pre-medicine, pre-health
Johnson College	Radiation technology; biomedical engineering
University of Scranton	Nursing, occupational therapy, physical therapy, counseling and human services, community health education, exercise science, pre-medicine
Pennsylvania College of Technology	Nursing, emergency medical services, occupational therapy, physician assistant
East Stroudsburg University	Nursing, counseling, public health
Lock Haven University	Nursing, pre-health professions, social work, physician assistant
Area Health Education Center, Keystone College	Medicine, allied health professions
Wright Center for Graduate Medical Education	Medicine
Internal Medicine Residency Program	
Wyoming Valley Family Medicine Residency Program	Family medicine
Williamsport Family Medicine Residency Program	Family medicine

the mood of the group was tentative as individual members seemed uncertain of their precise role. Nevertheless, by the third meeting the group was transformed into a cohesive and interactive panel, and brainstorming turned productive. NEPA IPEC member institutions agreed to integrate IPE into their health professions educational curricula. The

venue of coalition meetings has become rotational so that each member institution can host a meeting and “show off” their faculty and facilities, and this has optimized group buy-in and perceived ownership of the program. In March 2009, NEPA IPEC held its first annual IPE conference with national and international speakers and excellent regional attendance. The objective of this conference was to unite health professional educators, researchers and other stakeholders to achieve a unified understanding of what IPE means and to examine collaborative approaches to successful IPE implementation.

Interprofessional educational components

Interprofessional education learning objectives across the 4-year TCMC curriculum are shown in Table 2. The essentials of these objectives are to socialize health care students and professionals to work together, to help them develop mutual understanding and respect for various disciplines, and to impart collaborative practice competencies. Other schools involved in the NEPA IPEC have not yet established institutional curricular objectives of their own but they share in the TCMC IPE vision.

IPE educational components conducted to date include interprofessional panel discussions, simulation center activities, half-day collaborative-care seminars, and case-based interprofessional sessions and simulations. This academic year (2010) NEPA IPEC will develop synchronous web-based seminars (webinars) and newly innovative virtual environment interactive technologies, since these are

increasingly being used to create modes of online learning, and are relevant for IPE. Educational elements of webinars will include the use of standardized and simulated standardized patients, intragroup and interprofessional discussions (with faculty and student group leaders as facilitators), and group and individual participant reflection. A select list of relevant topics includes patient-centered disease and wellness topics, Accreditation Council for Graduate Medical Education (ACGME) core competencies (eg, communication, professionalism), informatics, clinical skills training, cross-cultural competency, faith and spirituality, medical ethics, leadership and management skills assessment, death and dying, domestic violence, research methods and skills, medical errors, global health strategies, teambuilding, and quality improvement.³⁻¹⁰ A library of cases will be developed and recorded and will be used for discussion by interprofessional groups or as individual web-based tutorials. Web-based IPE will include a facilitator training program, e-learning materials and interprofessional team working skills workshops.

Our regional IPE network uses advanced technology to enhance collaboration over a broad geographic area. Technologic requirements include internet upgrade programming, wireless human patient simulators, and telemedicine capabilities in order to optimize standardized patient physical examination and student interactions.^{11,12} TCMC's Clinical Skills and Simulation Center was developed as a shared resource for health professional students in the area, and serves as valuable asset and venue for regional IPE.

Table 2 Interprofessional education (IPE) learning objectives across the 4-year curriculum – The Commonwealth Medical College

Level 1	Level 2	Level 3	Level 4
1.1: Identify the roles, contributions and expertise of various health care professionals in the delivery of health care services to individuals, families and communities.	2.1: Describe the roles, contributions and expertise of various health care professionals in the delivery of health care services to individuals, families and communities.	3.1: Analyze the roles, contributions and expertise of various health care professionals in the delivery of health care services to individuals, families and communities.	4.1: Evaluate and assess the roles, contributions and expertise of various health care professionals in the delivery of health care services to individuals, families and communities.
1.2: Participate in inter-professional learning activities and examine self attitudes toward interprofessional collaboration in health care.	2.2: Participate in, reflect on and analyze inter-professional learning activities including identification of the benefits and challenges of interprofessional collaboration.	3.2: Participate in, reflect on and synthesize interprofessional experiences.	4.2: Demonstrate and support respectful collaboration with other members of the health care team, health care recipients and society to ensure optimal health and welfare of individuals, families and communities.
1.3: Identify values and beliefs of self in relation to medical practice within diverse interprofessional settings.	2.3: Describe and debate the importance of collaboration and communication with other members of the health care team, health care recipients and society to ensure optimal health and welfare of individuals, families and communities.	3.3: Create interprofessional relationships to maximize health care team function.	4.3: Act consistently in providing comprehensive, interprofessional, patient-centered health care to individuals, families and communities.

In the spring 2010, as part of NEPA IPEC's second annual IPE conference, more than 300 health professional students from the region participated in a collaborative-care seminar day. Disciplines included internal medicine, nursing, diagnostic imaging, pharmacy, paramedics, occupational therapy, nutritionists and physician assistant. Students were assigned to small groups (about 10–12 students) representing multiple professions. They worked through a case study which was facilitated by two faculty members of different health professions per group. The collaborative-care seminar took place concurrently at four separate locations and represented all 17 health education degree programs from our consortium.

Simulations offer another venue in which IPE components have been delivered at TCMC. For example, as part of the first-year neuroscience course students had to call a pharmacist to reconcile medications that their patient was taking. Faculty members from the Wilkes University Pharmacy program were on call to answer the student telephone inquiries when they came in. Students were required to present their patient to the pharmacist over the phone and discuss their patient's medication record. Additionally, this was an opportunity for the pharmacist to instruct the students about medication errors caused by sound-alike drug names. In Years 3 and 4, TCMC medical students will have an opportunity to work in a team with other health care professionals on the care of a simulated patient.

Discussion

As a new, community-based medical school with 3 regional campuses, TCMC is philosophically committed to developing a sustainable, embedded interprofessional module within its own integrated undergraduate health science curriculum, as well as within the curricula of health professional institutions in the region. The establishment of an institutional coalition to oversee IPE is an important aspect of our regional model. The NEPA IPEC has the objectives of exposure to different schools of thought, management of care via technology, networking and cultivation of global perspectives on health care delivery, and experience with novel educational approaches. Our varied curriculum comprises interprofessional experiences for students that reflect the six Institute of Medicine¹³ aims for health care. The innovation of our model lies in the extensive partnership/collaboration that has been established with 17 health sciences programs and institutions in the region to develop IPE capacity for (among others) students of medicine, nursing, pharmacy, occupational and physical therapy, clinical nutrition and social work, as well as family medicine and internal medicine residents (Table 1). Students

from all of the participating NEPA IPEC programs are also included now as members so that they may contribute to future IPE success in this regional model of IPE delivery.

There are numerous academic and logistical challenges or barriers to IPE delivery.¹⁴ On a practical level, developing IPE activities around differing academic calendars and class scheduling can be time-consuming, but these issues are usually worked through at the NEPA IPEC meetings. Recruitment of faculty for IPE activities has been easy, as participating faculty generally volunteer their time (in fact, across institutions we typically have more interested faculty than small group facilitator slots). As for space for IPE activities, the venues of coalition meetings and activities are rotational so that member institutions have an opportunity to highlight their faculties and facilities; this also has the advantage of sharing some of the costs of IPE. Finally, the high-level buy-in of academic leadership within the regional coalition, from program directors to college and university deans/provosts, has brought a tremendous degree of commitment and stability.

Integrating a curriculum is a complex process, and it is understood and experienced differently by students and faculty.¹⁵ Curran et al¹⁶ explored attitudes of health sciences students towards interprofessional teamwork and IPE. Medical and nursing students reported less positive attitudes towards interprofessional teamwork than pharmacy and social work students. Nursing, pharmacy and social work students had significantly more positive attitudes towards IPE than medical students, and woman and senior undergraduates demonstrated more positive attitudes towards interprofessional teamwork and IPE. Students with IPE experience had more positive attitudes towards interprofessional teams than those who had not been exposed to IPE. Westberg and colleagues⁹ used standardized patient experiences with pharmacy, medical and nursing students whose professional roles were switched, and noted that pharmacy students gained a better perspective about the roles of other health professionals overall.

The clinical teamwork training inherent in our shared curriculum can increase interprofessional competence, defined as knowledge and understanding of their own and the other team members' professional roles, comprehension of communication and teamwork, and collaboration in taking care of patients.^{16–22} In a team-based approach, IPE relies significantly on student leaders in helping guide their peers through the learning process. Hoffman and Harnish²³ used an evidence-based review of the literature and a questionnaire administered to Canada's top student leaders and determined that student leadership is essential to the success of IPE

because it enhances students' willingness to collaborate, and facilitates the long-term sustainability of IPE efforts.

Health sciences educators continue to debate the optimal timing for introducing IPE into the academic training of health professionals, although evidence-based IPE continues to be offered at increasingly early stages in students' professional development. Undergraduate health professions students are probably best molded early in their professional training, in order to minimize negative biases and perceptions.²⁴ Mandatory participation in IPE for pre-health professional students can result in profound changes in attitudes, interests and professionalism.²⁵ Even first-year undergraduate students can learn about teamwork and increase awareness about collaborative practice and care delivery.²⁶

We have already started to assess the effectiveness of our regional, integrated IPE curricular model. A pilot study, conducted to determine attitudes toward IPE at the NEPA IPEC Collaborative Care Seminar event in spring 2010, found the opinions of both health care students and facilitators to be generally positive (Table 3), although there were differing

Table 3 Selected comments from health care students and facilitators on an IPE summit

	Agree (%)	Strongly agree (%)
Health care students		
The case-discussion approach was an effective way to teach interprofessional concepts.	37.9	45.2
The case-discussion revealed new ideas on how to approach patient care.	32.4	42.9
After attending the summit, I have a greater understanding of the role of other health care professionals in the care of patients.	33.9	49.1
After attending the summit, I have a greater appreciation for my profession's role in the care of patients.	37.2	43.1
After attending the summit, I am able to identify gaps in my understanding of the role of other health care professionals.	31.7	50.0
I would recommend this summit to other students.	39.9	39.0
Overall, this program was effective.	35.3	45.9
Facilitators		
Overall, this program was effective.	63.0	33.3
I found this summit to be professionally rewarding.	63.0	29.6
I would participate as a facilitator in future summits.	85.2	11.1

attitudes toward interprofessional teamwork and education among health professional students.²⁷ The consortium plans additional qualitative (eg, via phenomenologic methods of empiric and reflective inquiry including student/faculty surveys of attitudes towards IPE and interprofessional teamwork) and quantitative research. The latter will utilize several instruments that have been used to monitor changes in attitudes and perceptions of IPE by undergraduate students from various kinds of health and social care programs, such as the Readiness for Interprofessional Learning (RIPLS) Scale and the Interdisciplinary Education Perception Scale (IEPS).^{16,28–30}

Dr Darrell Kirsch, President of the Association of American Medical Colleges (AAMC), has stated that interprofessional education and practice has been designated as a key strategic area that will be vital to the future culture of physicians.³¹ He recommended that simulation center resources be shared by health professional education programs since these centers are relevant venues for integrating health care professional students, and shared facilities and resources lead to shared curricular activities, creating interprofessional learning experiences. Currently, TCMC shares its Clinical Skills and Simulation Center with a number of health professions programs: nursing and nurse anesthetist students from the University of Scranton; physician assistants from Marywood University; internal medicine residents from the Wright Center for Medical Education Residency Program; and biomedical engineering students from Johnson College; and regional pediatric professionals (ie, pediatricians, nurses, respiratory therapists, and so on). Simulation activities include student learning in the areas of standardized patient exercises, patient assessment, practice in cardiorespiratory arrest (code) situations, and procedural skills such as intubation, placement of epidural catheters, arterial lines and central lines, vaginal birthing, physiology labs using the biopak systems, and repair and maintenance of medical equipment such as defibrillators and intravenous pumps.

In summary, our new regional model of IPE brings together multiple and geographically disparate stakeholders including undergraduate pre-health and health professional programs, and postgraduate medical education programs. As this integrated curriculum is implemented, its impact will be assessed and documented using specific quantitative and qualitative outcome measurements. Appropriate ongoing modifications to the model will be made to ensure improvement and further applicability to patient-centered learning and patient safety.

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Disclosure

The authors disclose no conflicts of interest.

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Appendix

Northeastern PA Interprofessional Education Coalition faculty membership

1. Maria Olenick, Director, Clinical Skills & Simulation Center, The Commonwealth Medical College, Scranton, PA (co-chair).
2. Dr John Szarek, Professor of Pharmacology, The Commonwealth Medical College, Scranton, PA.
3. Dr Raymond A. Smego, Jr., Associate Dean for Educational Development, The Commonwealth Medical College, Scranton, PA.
4. Dr Mark White, Assistant Professor of Epidemiology, The Commonwealth Medical College, Scranton, PA.
5. Dr Richard English, Associate Dean for Regional Development, The Commonwealth Medical College and Director, Wyoming Valley Family Medicine Residency Program, Wilkes-Barre, PA.
6. Dr Keith Schenberger, Associate Dean for Regional Development, The Commonwealth Medical College, Williamsport, PA.
7. Dr Gerald Tracy, Associate Dean for Regional Development, The Commonwealth Medical College, Scranton, PA.
8. Dr Edward Foote, Chair, Department of Pharmacy, Nesbitt College of Pharmacy and Nursing, Wilkes University, Wilkes-Barre, PA (co-chair).
9. Dr Jean Dyer, Dean, College of Health Sciences, Misericordia University, Wilkes-Barre, PA.
10. Dr Debra Pellegrino, Dean, Panuska College of Professional Studies, University of Scranton, Scranton, PA.
11. Dr Karen Arscott, Director, Physician Assistant Program, Marywood University, Scranton, PA.
12. Dr Mark Kilker, Dean, College of Health Sciences, East Stroudsburg University, East Stroudsburg, PA.
13. Dr Dana Clark, Vice President for Academic Affairs and Provost, Luzerne Community College, Wilkes-Barre, PA.
14. Dr Thomas Griffiths, Dean and Provost, Lycoming Community College, Williamsport, PA.
15. Dr Frances Feudale, Director, Physician Assistant Program, King's College, Wilkes-Barre, PA.
16. Michael Macedonia, Director of Paramedic Training, Lackawanna College, Scranton, PA.
17. Sharon Waters, Dean of Health Sciences, Pennsylvania College of Technology, Williamsport, PA.
18. Vera Walline, Executive Director, Area Health Education Center (AHEC), Keystone College, LaPlume, PA.
19. Dr Arjinder Sethi, Associate Program Director, Scranton Temple Internal Medicine Residency Program, Scranton, PA.
20. Dr MaryAnn Merrigan, Chairperson, Department of Nursing, Wilkes University, Wilkes Barre, PA.
21. Dr Diane Haleem, Director of Nursing Program, Marywood University, Scranton, PA.
22. Dr Marian Farrell, Department of Nursing, University of Scranton, Scranton, PA.
23. Wendy Manetti, Department of Nursing, Marywood University, Scranton, PA.
24. Diane Easton, Physician Assistant Program Faculty, King's College, Wilkes Barre, PA.
25. Patricia Vanston, Assistant Dean for Continuing Education, The Commonwealth Medical College, Scranton, PA.
26. Carol Chaykosky, Area Health Education Center (AHEC), Keystone College, LaPlume, PA.

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