

Changes in Physical and Occupational Therapy Students' Self-efficacy Using an Interprofessional Case-based Educational Experience

Carole K. Ivey, PhD, OTR/L, Dixie H. Bowman, PT, DPT, EdD, and Kelly S. Lockeman, PhD

Introduction. The Commission on Accreditation in Physical Therapy Education and the Accreditation Council for Occupational Therapy Education require the integration of interprofessional education (IPE) into their respective educational programs. This follows reports from the Institute of Medicine and the World Health Organization that highlight the importance of IPE to prepare professionals for interprofessional collaborative practice. However, information related to practical strategies to incorporate learning experiences into the curriculum is sparse. The purpose of this study was to examine the impact of an interprofessional simulation on the self-efficacy of physical therapy (PT) and occupational therapy (OT) students and to explore student perceptions of the IPE experience to better understand their engagement in learning.

Methods. The study sample included 51 first-year PT students and 36 third year OT students, all enrolled in a case-based class, respectively. A quasi-experimental pretest-posttest design was used to examine changes in self-efficacy for interprofessional learning among participants after an interprofessional

simulation activity. Participants completed the Self-Efficacy for Interprofessional Experiential Learning (SEIEL) survey 1 week before the simulation activity (pretest) and 1 week after (posttest.) Qualitative methods were used to gather feedback from participants about the learning activity.

Results. Self-efficacy scores for OT students and PT students on each SEIEL subscale were calculated. For the interprofessional interaction subscale, there was a significant main effect between pretest and posttest scores, with posttest scores higher than pretest scores. There was no difference based on whether they were an OT or PT student. Similarly, there was a significant main effect between pretest and posttest scores on the interprofessional team evaluation and feedback subscale, whereas there was no significant effect based on student discipline. Both OT and PT students reported they gained knowledge about the other profession's role, scope of practice, goals, and evaluation and treatment activities and described the opportunity to plan and problem solve as the most helpful aspect of this learning activity. Their responses indicated that they perceived the greatest learning through the direct hands-on time with the standardized patients and the rest of the time was not valuable as they were just watching.

Discussion and Conclusion. Occupational therapy and PT students benefited equally with improved self-efficacy and positive learning outcomes. In a time with many uncertainties in IPE, this study provides evidence that a single, brief learning activity can be beneficial.

Key Words: Interprofessional education, Teaching and learning, Teaching methods, Entry level education, Self-efficacy.

The Commission on Accreditation in Physical Therapy Education¹ and the Accreditation Council for Occupational Therapy Education² require the integration of interprofessional education (IPE) into physical

therapy (PT) and occupational therapy (OT) educational programs. This follows reports from the Institute of Medicine³ (IOM) and the World Health Organization⁴ that highlight the importance of IPE to prepare professionals for interprofessional collaborative practice. Although interprofessional collaborative practice is not a new concept in health and social care, an IOM report highlighted the high cost of medical errors due to poor collaborative practices.⁵ Since then, a major emphasis has been placed on interprofessional collaborative practice, with demonstrated positive outcomes on improved health care processes, more patient-focused and responsive services with less communication errors, avoidance of duplication and fragmentation, more satisfied roles for health care professionals, and improved patient outcomes.⁶⁻⁹

As a result, IPE has been prioritized as key to developing the attitudes, skills, and behaviors necessary to promote interprofessional collaborative practice.³ World Health Organization defines IPE as occurring "when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes."⁴ In 2009, the Interprofessional Education Collaborative (IPEC) was established to "advance substantive interprofessional learning experiences to help prepare future health professionals for enhanced team-based care of patients and improved population health outcomes."¹⁰ Originally comprised of professions of medicine, nursing, pharmacy, dentistry, and public health, nine additional members were added, including the American Council of Academic Physical Therapy and the American Occupational Therapy Association, to participate in updating the core competencies for interprofessional collaborative practice.¹⁰

Despite the widespread call for IPE, evidence-based practical strategies to incorporate interprofessional learning experiences into the curriculum are sparse.^{8,11} Simulated patient encounters are one type of practical intervention proposed to address attitudes toward interprofessional practice and specific interprofessional competencies related to communication, collaboration, and

Carole K. Ivey is an assistant professor in the Department of Occupational Therapy at Virginia Commonwealth University.

Dixie H. Bowman is an assistant professor in the Department of Physical Therapy at Virginia Commonwealth University, Box 980224, Richmond, VA 23298 (dlbowman@vcu.edu). Please address all correspondence to Dixie H. Bowman

Kelly S. Lockeman is an assistant professor at the School of Medicine and is director of the Evaluation and Assessment Center for Interprofessional Education and Collaborative Care, Virginia Commonwealth University.

The authors declare no conflicts of interest.

Received February 12, 2018, and accepted March 23, 2018.

Copyright © 2018 Academy of Physical Therapy Education, APTA

DOI: 10.1097/JTE.0000000000000055

understanding of roles. These experiences are also used to address clinical readiness skills.^{12,13} Simulation has shown improvements in positive student attitudes, increased understanding of professional team roles, and development of effective communication skills.^{14,15} Simulation is often classified regarding the level of technology and fidelity. Standardized patients (SPs) are considered to be low-technology, high-fidelity simulators. Although often done using trained actors for high fidelity, SPs can also be trained faculty and clinicians.

Prast et al¹⁶ provide insight into several key factors necessary for successful IPE activities and simulations. First, it is important to identify instructors in other disciplines who teach similar content and then work with them to develop a simulation that meets the learning goals of each profession. Second, faculty should plan IPE activities the semester before implementation, as coordination of schedules can be challenging. By being actively engaged in IPE, faculty role-modeled teamwork and collaboration. Finally, when students receive materials in advance and have time to prepare for the IPE experience, they report increased levels of confidence. Shoemaker et al¹⁷ described a simulation design for physician assistant, PT, and OT students that maximizes resources and opportunities for student participation by focusing on each aspect of the simulation interaction with the SP, an opportunity to observe and complete a peer evaluation in the simulated clinical interaction, simulation debriefing, and a self-evaluation.

In addition to specific clinical and interprofessional competencies addressed through a simulated activity, the relationship between self-efficacy and IPE has been examined.^{18,19} Albert Bandura, an early cognitive psychologist, defined self-efficacy as “the belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations.”²⁰ A study by Caldwell et al⁶ explored the relevance of initial training to interprofessional collaboration and explored perceptions of newly qualified practitioners about their self-efficacy to work as a member of a team. They found most of those answering felt confident in teamwork and that the education they had received working as part of a team related to their subsequent practice experience. Other studies have shown an association between medical students’ engagement in interprofessional experiences and self-efficacy.^{19,21} There have been limited studies that examine interprofessional experiences and self-efficacy among PT and OT students.²²

This study examined the impact of an interprofessional simulation on the self-efficacy

of PT and OT students. We also explored student perceptions of the IPE experience to better understand their engagement in learning. Enhanced understanding of engagement and outcomes of a simulation encounter on students’ self-efficacy can inform physical and OT curricular planning.

We used the *How People Learn* pedagogical framework to guide our learning activity toward enhancing student understanding of roles and responsibilities, developing self-efficacy, and promoting knowledge and skill development. *How People Learn* identifies four lenses as critical to effective learning environments: learner-centered, knowledge-centered, assessment-centered, and community-centered.²³ Using this framework, we considered the different learners in our activity, focusing on the similarities between the PT and OT students as well as their different perspectives. Considering the knowledge-centered lens, we ensured that the activity incorporated the current knowledge and skill level of both groups of students, considering not only their different disciplinary perspectives but also their different year in the program (Doctor of Physical Therapy [DPT] students were in their first year and Master of Science in Occupational Therapy [MSOT] students were in their second year). The learning activity was also constructed to build deep knowledge and understanding through meaningful application with a case similar to a real patient that all of the students would encounter in practice. Considering the assessment-centered lens, we built consistent opportunities for instructors to monitor students’ progress, provide feedback, and incorporate feedback immediately into the simulation. The community-centered lens emphasizes social learning opportunities that provide ongoing challenge and scaffolding to promote meaningful learning. Bringing the two groups of students together to work in small groups and allow time for interaction, following the modeling of the interprofessional team of instructors, allowed the development of a community-centered learning environment.

METHODS

Participants

Participants were second-year students in a MSOT program and first-year students in a DPT program at Virginia Commonwealth University University in Richmond, Virginia. During the time of the study, the OT students were enrolled in a required case-based clinical reasoning course in their own program, and PT students were enrolled in a required adult intervention course in their program. As part of

their respective courses, students participated in one interprofessional class lab session, which provided the opportunity for the study. A convenience sample of students from each course was recruited. Although all students were required to take their respective professional course and participate in the interprofessional session, they were not required to participate in the study. Participation was anonymous and had no impact on a student’s course grade or other assessments. Information regarding consent was presented to the students before administration of the pretest measure, and those students who chose to participate completed the study’s pretest and posttest measures. The school’s institutional review board approved the study.

Design

This was a mixed methods study. A quasi-experimental pretest–posttest design was used to examine changes in self-efficacy for interprofessional learning among participants after an interprofessional simulation activity. Qualitative methods were used to gather feedback from participants about the learning activity.

Procedure

As part of the students’ coursework, one 2-hour class session was devoted to an interprofessional simulation learning activity. The first time we coordinated this activity, time was spent modifying the case to meet the learning needs of the students and establishing reliability in our presentation of symptoms as the simulated patient. Once the case was established, planning time included coordinating a date, time, and place for the learning activity. Because we used course instructors as the simulated patient, there were no costs paying a SP. Additionally, we incurred no cost for materials as we used our individual departments’ lab materials.

Enrolled students were divided into four class sessions, with each session having three groups of approximately four to five OT students and five to six PT students. The detailed class session plan was reviewed with the students (Table 1). During planning times, the three course instructors (two OT and one PT) circulated through the room, facilitating discussion and guiding groups as needed. Upon time to conduct the patient evaluation, student groups were assigned an instructor, who served as the SP playing the role of “Frances.”

Frances is a case of a 78-year-old woman with Parkinson disease who has been admitted to the hospital due to recent falls. The written case was developed by Ghikas and Copper²⁴ and modified by the course instructors for use in a simulation lab with our students. Before conducting the class sessions,

Table 1. Class Session Plan

Time	Activity
25 min	Meet team
	Review Frances case study
	Develop OT/PT co-evaluation plan
	Gather necessary materials
20 min	Conduct OT/PT co-evaluation
5 min	Debrief with simulation instructor
20 min	Develop OT/PT co-treatment plan
20 min	Conduct OT/PT co-treatment session
5 min	Debrief with simulation instructor
15 min	Debrief with entire class

Abbreviations: OT = occupational therapy; PT = physical therapy.

the instructors reviewed the case as a group and developed a plan for ensuring reliability, which involved co-training each other on the simulation. Specific areas of focus were consistent with physical responses (e.g., range of motion, strength testing, gait patterns), assistance levels (e.g., walking and activities of daily living), and verbal and emotional responses (e.g., family, interests, and emotional lability) in line with the written case data. This study was conducted during the fourth year that the interprofessional activity was offered.

The activity included both an evaluation component and a treatment component, and student groups remained with the same “Frances” instructor for both components of the exercise. After the treatment component, the three groups in each session participated in a large group debriefing. The discussion was focused on concepts of maximizing use of both the therapeutic services, preventing duplication in services (in service delivery and in documentation), reimbursement, and professional roles and responsibilities.

Measures

Interprofessional Self-efficacy. Participants completed the Self-Efficacy for Interprofessional Experiential Learning (SEIEL) survey²⁵ 1 week before the simulation activity (pretest) and 1 week after (posttest). The SEIEL is a 16-item interprofessional self-efficacy survey that has been shown to have high internal consistency.^{19,25} The original analysis revealed two subscales: interprofessional interaction (Chronbach’s $\alpha = 0.94$) and interprofessional team evaluation and feedback (Chronbach’s $\alpha = 0.93$).²⁵ Respondents rated each survey item on a 10-point Likert-type scale, with higher scores reflecting greater confidence in their abilities. To match

pretest and posttest survey responses, participants were asked to record the last four digits of their social security number on their surveys. University faculties do not have access to student social security numbers.

Survey Questions. In addition to the SEIEL, the posttest included four open-ended questions asking about the most helpful and least helpful aspects of the learning activity, the knowledge and skills students felt they gained from the learning activity, and to share other comments regarding the interprofessional nature of the learning activity.

Data Analysis

Quantitative Data. Self-Efficacy for Interprofessional Experiential Learning responses were analyzed using SPSS for Windows version 23.0.²⁶ Ninety-four students total completed the pretest, with 51 PT students (96.2% of the class) and 36 OT students (85.7% of the class) completing the pretest, with 7 pretests that did not report their discipline. Ninety students total completed the posttest, 52 PT students (98.1% of the class) and 38 OT students (90.5% of the class). Before inferential analyses, data were screened for missing values and to ensure that the assumptions for analysis of variance (ANOVA) were met. Eleven participants were missing data such as discipline, or there were no matched pairs of pretest and posttest responses, so their responses were excluded from further analysis. Additionally, an outlier’s test revealed 1 outlier, which was also excluded, resulting in 87 participants with complete survey data (36 OT students, 41.4%, and 51 PT students, 58.6%, representing 85.7% of the OT class and 96.2% of the PT class). Data were checked for normality and found to meet the criteria. Mauchly’s test indicated that the assumption of sphericity was

met. Scores for each subscale of the SEIEL (interprofessional interaction and interprofessional team evaluation and feedback) were calculated as the mean of the representative items. Responses for three students (one PT and two OT) were each missing 1 data point, which was deemed acceptable for calculating subscale scores without imputation.

Descriptive statistics were calculated for the SEIEL subscales, and one-way repeated-measures ANOVA were used to compare scores on each subscale before and after the interprofessional simulated learning activity and to examine differences based on student discipline (OT or PT).

Qualitative Data. Eighty-eight students (36 OT and 52 PT) responded to the open-ended questions on the posttest survey. Responses were analyzed using manifest content analysis.²⁷ One reviewer reviewed all responses, using an inductive approach looking for common content that emerged from responses to each question. Then the reviewer marked the occurrence of each content on a coding sheet every time the content appeared. As new content emerged, that code was added to the sheet and tallied. After completion, codes were compared across disciplines. To provide evidence of confirmability, a second reviewer independently read student comments to corroborate the summary prepared by the first reviewer.

RESULTS

Quantitative Data

Self-efficacy scores for OT students and PT students on each SEIEL subscale are displayed in Table 2. For the interprofessional interaction subscale, there was a significant main effect between pretest and posttest scores, with posttest scores higher than pretest scores, $F(1,85) = 66.192, P < .00$. There was no difference based on type of therapy student (OT and PT), $F(1, 85) = 3.49, P = .065$. Similarly, there was a significant main effect between pretest and posttest scores on the interprofessional team evaluation and feedback subscale, $F(1, 85) = 123.85, P < .00$, whereas there was not a significant effect based on student discipline, $F(1,85) = 1.780, P = .186$.

Qualitative Data

Themes from open-ended comments by students are displayed in Table 3. Comments were overwhelmingly positive. Most PT and OT students (73% and 64%, respectively) commented that they liked, benefited from, and had fun in the lab, it was helpful, or they wanted more lab experiences like this lab in response to the open-ended question “What

Table 2. Mean (SD) Pretest and Posttest Scores on Each Self-Efficacy for Interprofessional Experiential Learning Factor by Student Discipline and Overall

	Interprofessional Interaction		Interprofessional Team Evaluation and Feedback	
	Pre	Post	Pre	Post
OT (N = 36)	6.77 (SD 1.54)	7.53 (SD 1.16)	6.17 (SD 1.32)	7.26 (SD 1.08)
PT (N = 51)	7.08 (SD 1.12)	8.30 (SD 1.04)	6.44 (SD 1.15)	7.83 (SD 1.00)
Total (N = 87)	6.95 (SD 1.31)	7.98 (SD 1.15)	6.33 (SD 1.23)	7.59 (SD 1.07)

Abbreviations: OT = occupational therapy; PT = physical therapy.

other comments do you have on the interprofessional nature of this learning activity?” Both OT and PT students reported they gained knowledge about the other profession’s role, scope of practice, goals, and evaluation and treatment activities. They also stated they gained knowledge and skills related to collaboration, such as how to plan and perform an evaluation and treatment session together, what it would look like, how to combine “two different schools of thought,” and how challenging it can be. Occupational therapy students conveyed that the lab gave them the opportunity to gain communication skills related to client communication and rapport as well as communicating with the team. Physical therapy students also reported the lab provided opportunities for communication skills, but more stated that it developed their clinical knowledge and skills with working with a client with Parkinson’s disease. Occupational therapy students also reported improvement in clinical skills. To a lesser degree, students also reported that they gained confidence,

education and advocacy skills, and time management skills.

Both OT and PT students described the opportunity to plan and problem solve as the most helpful aspect of this learning activity. Students appreciated that the case required them to plan, to work together, and to compromise on evaluation and treatment plans. Additionally, they liked that the planning allowed them an opportunity to talk with their peers. As one student stated, “it was really great just to be able to sit down and talk with another profession in an academic setting while working on a realistic case.” Occupational therapy students reported that learning from PT students about their perspectives as well as their clinical skills, such as manual muscle and range of motion testing, was the second most helpful aspect of the learning activity. Physical therapy students stated that the real-life practice afforded by role playing was the second most helpful aspect of this learning activity, whereas OT students found that to be the third most helpful aspect. As stated by one student, the simulation “helped me visualize our

respective roles and the teamwork required—it’s different than just discussing in a classroom ‘we need more teamwork’”.

Occupational therapy and PT students agreed that the group size of 8 to 10 students per SP was the least helpful aspect of the learning activity. Although some students found it helpful to have an opportunity to observe and problem solve with their peers, most stated that there was too much time just watching and waiting for their hands-on turn. Students also reported that time constraints were the second least helpful aspect of the lab. Most students reported that more time to collaborate and plan would be better, but other issues with time were reported such as the day/time of the lab and time to walk to the other building. Finally, students reported that feedback was the third least helpful aspect. Again, although some students reported instructor feedback as helpful, some students wanted greater opportunities for instructor reflection, direct in-time reflection, discipline-specific reflection, or reflection time from peers.

Table 3. Themes From Open-Ended Student Comments

	OT (N = 36)	PT (N = 52)
Knowledge and skills gained	1. Knowledge of PT role, scope of practice, goals, evaluation, and treatment activities	1. Knowledge of OT role, scope of practice, goals, evaluation and treatment activities
	2. Collaboration with PT	2. Collaboration with OT
	3. Communication skills	3. Clinical skill development
	4. Clinical skill development	4. Communication skills
Most helpful	1. Planning and problem solving	1. Planning and problems solving
	2. Learning from PT students	2. Practice for real life with role play
	3. Practice for real life with role play	3. Collaboration
Least helpful	1. Too many students on each team	1. Too many students on each team
	2. Time	2. Time
	3. Feedback	3. Feedback
Other information	1. They liked/benefited/had fun in lab	1. They liked/benefited/had fun in lab
	2. Want more lab experiences like this	2. Want more lab experiences like this

Abbreviations: OT = occupational therapy; PT = physical therapy.

Table 4. Interprofessional Education Collaborative Competences Addressed in Occupational Therapy/Physical Therapy Simulation Activity

Roles/responsibilities: Use the knowledge of one's own role and those of other professions to appropriately assess and address the health care needs of patients and to promote and advance the health of populations.
RR1. Communicate one's roles and responsibilities clearly to patients, families, community members, and other professionals. ^a
RR2. Recognize one's limitations in skills, knowledge, and abilities. ^a
RR3. Engage diverse professionals who complement one's own professional expertise, and associated resources, to develop strategies to meet specific health and health care needs of patients and populations.
RR4. Explain the roles and responsibilities of other providers and how the team works together to provide care, promote health, and prevent disease.
RR5. Use the full scope of knowledge, skills, and abilities of professionals from health and other fields to provide care that is safe, timely, efficient, effective, and equitable.
RR6. Communicate with team members to clarify each member's responsibility in executing components of a treatment plan or public health intervention. ^a
RR7. Forge interdependent relationships with other professions within and outside of the health system to improve care and advance learning.
RR8. Engage in continuous professional and interprofessional development to enhance team performance and collaboration. ^a
RR9. Use unique and complementary abilities of all members of the team to optimize health and patient care. ^a
RR10. Describe how professionals in health and other fields can collaborate and integrate clinical care and public health interventions to optimize population health.
Interprofessional communication: Communicate with patients, families, communities, and professionals in health and other fields in a responsive and responsible manner that supports a team approach to the promotion and maintenance of health and the prevention and treatment of disease.
CC1. Choose effective communication tools and techniques, including information systems and communication technologies, to facilitate discussions and interactions that enhance team function.
CC2. Communicate information with patients, families, community members, and health team members in a form that is understandable, avoiding discipline-specific terminology when possible. ^a
CC3. Express one's knowledge and opinions to team members involved in patient care and population health improvement with confidence, clarity, and respect, working to ensure common understanding of information, treatment, care decisions, and population health programs and policies. ^a
CC4. Listen actively and encourage ideas and opinions of other team members. ^a
CC5. Give timely, sensitive, instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from others.
CC6. Use respectful language appropriate for a given difficult situation, crucial conversation, or conflict.
CC7. Recognize how one's uniqueness (experience level, expertise, culture, power, and hierarchy within the health team) contributes to effective communication, conflict resolution, and positive interprofessional working relationships (University of Toronto, 2008). ^a
CC8. Communicate the importance of teamwork in patient-centered care and population health programs and policies.
Teams and teamwork: Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan, deliver, and evaluate patient/population-centered care and population health programs and policies that are safe, timely, efficient, effective, and equitable.
TT3. Engage health and other professionals in shared patient-centered and population focused problem-solving. ^a
TT4. Integrate the knowledge and experience of health and other professions to inform health and care decisions while respecting patient and community values and priorities/preferences for care. ^a
TT10. Use available evidence to inform effective teamwork and team-based practices.
TT11. Perform effectively on teams and in different team roles in a variety of settings. ^a

^aPrimary competency addressed in the simulation activity.

DISCUSSION

Our results showed that both OT and PT students had significant positive changes in their interprofessional self-efficacy after a single interprofessional simulation activity

involving OT and PT students. Students also recognized that this activity provided them with valuable interprofessional learning opportunities. Occupational therapy and PT students benefited equally with improved self-

efficacy and positive learning outcomes. In a time with many uncertainties in IPE, this study provides evidence that a single, brief (2-hour) learning activity can be beneficial. This is significant because a major barrier to

IPE activities is fitting interprofessional learning opportunities into an already packed curriculum.²⁸ Additionally, this allows professors from both programs to have discussion about working together, knowing it will benefit both groups of students.

Students reported positive learning on their knowledge and skills of the other's professional roles and responsibility, collaboration, communication, and clinical skills. In examining the learning opportunities of the activity, students have opportunities to practice clinical skills (e.g., taking blood pressure, completing range of motion and manual muscle tests, performing transfers, using assistive devices, and implementing interventions). These clinical skill development opportunities were noted in students' responses, such as saying the most helpful aspect was the "ability to practice transfers" or knowledge and skills were gained in how "to evaluate and treat a Parkinson's patient." After coding, it was interesting to note that students' responses to the open-ended questions corresponded to the IPEC competencies related to roles and responsibilities and interprofessional communication, as well as some of the team and teamwork competencies (Table 4). For instance, students responded that it was helpful "learning about the other's role during a treatment session" and "this allowed me to see the roles of the different professions." Students commented on the teamwork knowledge and skills gained, stating, "I shouldn't feel like I personally need to do every little thing with a patient. It's okay to allow other professions to help and improve overall quality of care." They also commented on interprofessional communication skills, stating they gained "better communication skills" and it was valuable "collaborating and talking things out with others." Again, this supports the notion that this short lab experience allowed the opportunity to not only address professional clinical skills but also a significant number of interprofessional competencies.

One of the main concerns expressed by students was their limited hands-on experience due to taking turns within their group of four to six students. Their responses indicated that they perceived the greatest learning through the direct hands-on time with the SP and the rest of the time was not valuable as they were just watching. Bandura²⁹ defined four major sources that contribute to the development of self-efficacy beliefs: 1) performance accomplishments (successful experiences lead to greater feelings of self-efficacy), 2) vicarious experience (observing others succeed who are similar to yourself increase feelings of self-efficacy), 3) verbal persuasion (constructive feedback leads to feeling capable of performing a task), and 4) physiological states (not feeling anxiety or nervousness

increases feelings of self-efficacy). Within this construct, students perceived the greatest development of skills, likely clinical skills, related to performance accomplishments, and perhaps to a lesser degree with physiological states. However, the experience was also designed to include vicarious experience and verbal persuasion. For instance, when students were not in direct contact with the SP, they were encouraged to observe and assist their peers if help was needed, to act collectively as "one PT" or "one OT" during the session. It appears that students needed more guidance on how to effectively integrate this type of learning.

Surprisingly, no students indicated concerns with completing the role playing with their instructors as the patient. In fact, it may appear that the opposite was true. Many students commented that one of the most helpful aspects was getting feedback from the instructors, such as "working on a scenario with an instructor that provided constructive feedback." It may be that this position provides the most authentic view of the patient, allowing the instructors to provide feedback on not only therapeutic interactions but also physical handling skills.

Self-efficacy was assessed in a simulated activity rather than real clinical practice. Despite efforts to make the simulation as real as possible, the environment is still limited. Additionally, simulation was done with a group rather than individual students, which limited the uniformity of the activity across all students. Our study was conducted at one university with a small group of students, which limits the generalizability of our findings to other schools and settings.

Future Directions

One of the main concerns for students was the large group size. Their comments overwhelmingly centered on how this limited their hands-on opportunities and, therefore, their learning. In the future, we plan to add additional personnel to act as SPs to allow for smaller groups. Completing this activity in individual PT/OT teams would provide increased hands-on opportunity for each student, but then it does not allow opportunities for Bandura's principles of vicarious experience (observing others succeed who are similar to yourself increase feelings of self-efficacy) and verbal persuasion (constructive feedback leads to feeling capable of performing a task).²⁹ To balance this in the future, we can provide further guidance regarding learning opportunities to students when they are not the "hands-on therapist," such as what to observe when other students are leading and how to provide constructive feedback to peers.

Future studies will integrate knowledge and skill gains along with measures of self-efficacy and student perceptions. This will provide more robust evidence regarding actual change versus student perceptions of knowledge and skill development. As noted in student feedback, we will add a peer assessment to provide students the opportunity to learn how to give and receive positive and constructive feedback from a peer colleague to enhance their learning. With these minor changes, we plan to continue this activity in both programs due to the value of the IPE experience to strengthen interprofessional collaboration among PT and OT students. Consideration might be given to determining if this activity has an impact on their future clinical performance and their ability to collaborate with each other.

REFERENCES

1. Commission on Accreditation in Physical Therapy Education Accreditation Handbook: Physical therapy standards and required elements. Commission on Accreditation in Physical Therapy Education. 2016. <http://www.captonline.org/AccreditationHandbook/>. Accessed January 18, 2017.
2. Accreditation Council for Occupational Therapy Education. *Accreditation Council for Occupational Therapy Education Standards and Interpretive Guide*. Bethesda, MD: Author; 2011.
3. Institute of Medicine. *Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models across the Continuum of Education to Practice: Workshop Summary*. Washington, DC: The National Academies Press; 2013.
4. World Health Organization. Framework for action on interprofessional education and collaborative practice. 2010. http://www.who.int/hrh/resources/framework_action/en/. Accessed May 3, 2017.
5. Kohn LT, Corrigan J, Donaldson MS. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 2000.
6. Caldwell K, Atwal A, Coop G, Brett-Richards M, Coleman K. Preparing for practice: How well are practitioners prepared for teamwork. *Br J Nurs*. 2006;15:1250-1254.
7. Eva K. Teamwork during education: The whole is not always greater than the sum of the parts. *Med Educ*. 2002;36:314-316.
8. Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: Effects on professional practice and healthcare outcomes (update). *Cochrane Database Syst Rev*. 2013;CD002213. doi: 10.1002/14651858.CD002213.pub3.
9. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: Effects of practice-based interventions on professional practice and healthcare outcomes. *Cochrane Database Syst Rev*. 2009;CD000072. doi: 10.1002/14651858.CD000072.pub2.

10. Interprofessional Education Collaborative. *Core Competencies for Interprofessional Collaborative Practice: 2016 Update*. Washington, DC: Interprofessional Education Collaborative; 2016.
11. Thistlethwaite J, Moran M. Learning outcomes for interprofessional education (IPE): Literature review and synthesis. *J Interprof Care*. 2010;24:503-513.
12. Giles AK, Carson NE, Breland HL, Coker-Bolt P, Bowman PJ. Conference Proceedings: Use of simulated patients and reflective video analysis to assess occupational therapy students' preparedness for fieldwork. *Am J Occup Ther*. 2012;68:S57-S66.
13. Gorman SL, Lazaro R, Fairchild J, Kennedy B. Development and implementation of an objective structured clinical examination (OSCE) in neuromuscular physical therapy. *J Phys Ther Educ*. 2010;24:62-68.
14. King J, Beanlands S, Fiset V, et al. Using interprofessional simulation to improve collaborative competences for nursing, physiotherapy, and respiratory therapy students. *J Interprof Care*. 2016;30:599-605.
15. Wamsley M, Staves J, Kroon L, et al. The impact of an interprofessional standardized patient exercise on attitudes toward working in interprofessional teams. *J Interprof Care*. 2012; 26:28-35.
16. Prast J, Herlache-Pretzer E, Frederick A, Gafni-Lachter L. Practical strategies for integrating interprofessional education and collaboration into the curriculum. *Occup Ther Health Care*. 2015;00:1-9.
17. Shoemaker M, Beasley J, Cooper M, Perkins R, Smith J, Swank C. A method for providing high-volume interprofessional simulation encounters in physical and occupational therapy programs. *J Allied Health*. 2011;40: e15-e21.
18. Coogle CL, Hackett L, Owens MG, Ansello EF, Mathews JH. Perceived self-efficacy gains following an interprofessional faculty development programme in geriatrics education. *J Interprof Care*. 2016;30:483-492.
19. Oza SK, Boscardin CK, Wamsley M, et al. Assessing 3rd year medical students' interprofessional collaborative practice behaviors during a standardized patient encounter: A multi-institutional, cross-sectional study. *Med Teach*. 2015;37:915-925.
20. Bandura A. *Self-Efficacy in Changing Societies*. Cambridge: Cambridge University Press; 1995.
21. Mavis B. Self-efficacy and OSCE performance among second year medical students. *Adv Health Sci Educ*. 2001;6:93-102.
22. NØrgaard B, Draborg E, Vestergaard E, Odgaard E, Jensen DC, SØrensen J. Interprofessional clinical training improves self-efficacy of health care students. *Med Teach*. 2013;35:e1235-e1242.
23. National Research Council. *How People Learn: Brain, Mind, Experience, and School (Expanded ed.)*. Washington, DC: National Academy Press; 2000.
24. Ghikas P, Copper M. *Case Studies in Rehabilitation*. Thorofare, New Jersey: Slack Incorporated; 2001. ISBN-13: 978-1556424250.
25. Mann K, McFetridge-Durdle J, Breau L, et al. Development of a scale to measure health professions students' self-efficacy beliefs in interprofessional learning. *J Interprof Care*. 2012;26:92-99.
26. *SPSS for Windows. Version 23.0*. Armonk, NY: IBM Corporation; 2015.
27. Potter WJ, Levine-Donnerstein D. Rethinking validity and reliability in content analysis. *J Appl Commun Res*. 1999;27:258-284.
28. Wellmon R, Gilin B, Knauss L, Linn M. Changes in student attitudes toward interprofessional learning and collaboration arising from a case-based educational experience. *J Allied Health*. 2012;41:26-34.
29. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev*. 1977; 84:191-215.