

Comparable Outcomes Between Face-to-Face and Online Deliveries of an Introduction to IPE Event for Occupational Therapy and Physical Therapy Students

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Abstract

INTRODUCTION Physical rehabilitation is conducted by several health care professionals, including occupational therapists and physical therapists. Developing a foundational understanding of roles, responsibilities, and teamwork is essential for students in occupational therapy and physical therapy. The *Introduction to IPE* event with occupational therapy and physical therapy students was successfully implemented face-to-face in the past; however, due to the COVID-19 pandemic, the event was modified to an online format. This study aims to compare the outcomes of online versus face-to-face delivery methods in an introductory interprofessional education activity for occupational therapy and physical therapy students.

METHODS First semester occupational therapy and physical therapy students were placed in small groups to discuss professional identities and interprofessional collaboration. Students completed the Readiness for Interprofessional Learning Scale (RIPLS) pre-post-meeting and a written reflection post-meeting.

RESULTS No differences in RIPLS scores were found between face-to-face and online delivery of an IPE event. Qualitatively assessed themes of the face-to-face and online students' reflections were similar in several areas. Additional themes from the online group included the influence of the COVID-19 pandemic on collaborative learning activities and the disproportion of group size leading to feelings of power imbalance.

DISCUSSION Online delivery of an introductory IPE offering produced similar results as face-to-face delivery.

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Implications for Interprofessional Practice

- Findings support the importance of IPE implemented in various contexts (online vs. face-to-face) to improve collaboration, teamwork, and communication among health professional students which can positively impact working relationships in clinical practice post-graduation.
- Qualitative analysis of student reflections provide awareness of students' pre-existing biases and perceptions towards other professions can help clarify role delineation and solidify one's own professional scope of practice, roles, and responsibilities.

Introduction

There is limited research comparing interprofessional education (IPE) activities in an online versus face-to-face format. In March 2020, the COVID-19 pandemic significantly disrupted higher education. Courses traditionally taught face-to-face quickly transitioned to online formats to adhere to social distancing guidelines (CDC, n.d.; Quintana, 2020). Online IPE offerings have been executed before the pandemic and have advantages over face-to-face events. Studies report that students find online IPE to be a positive way to engage (Myers & O'Brien, 2015) and provides flexibility (Jones, Vidal, & Taylor, 2020; Myers & O'Brien, 2015). Challenges to online delivery include computer and technology issues that can lead to communication challenges and lack of connection (Jones, Vidal, & Taylor, 2020).

In the past, a face-to-face IPE activity, *Introduction to IPE*, was executed with first-semester Occupational therapy (OTD) and Physical therapy (DPT) students (Trojanowski et al., 2021), leading to improved student attitudes toward readiness to learn about IPE, particularly in the Interprofessional Education Collaborative (IPEC) competencies on Roles and Responsibilities and Teams and Teamwork (IPEC, 2016). The face-to-face *Introduction to IPE* activity transitioned to an online format secondary to the pandemic.

The purpose of this research study is to compare delivery methods (online vs. face-to-face) of an introductory IPE activity. The research question was is there a difference in OTD and DPT students' attitudes toward engaging in IPE and knowledge gained about interprofessional collaboration.

Methods

Research Design

In 2019, ninety-one graduate students from the OTD (n=31) and DPT (n=60) programs participated in the *Introduction to IPE* event via face-to-face delivery, concluding that IPE activities can be implemented during the first semester of professional education with positive effects (Trojanowski et al., 2021). In 2020, eighty graduate students from the OTD (n=24) and DPT (n=56) programs participated in the *Introduction to IPE* event online. Students were arranged into small groups during the event (1 OTD student and 2-3 DPT students). A dedicated platform for this IPE offering was created in the university's Learning Management System to house instructions, links to surveys, and contact information for the groups. Students completed the Readiness for Interprofessional Learning Scale (RIPLS) pre-and post-activity electronically (Qualtrics, LLC, Provo, Utah). The RIPLS is a 19-item instrument that assesses students' attitudes toward interprofessional learning. The RIPLS uses a 5-point Likert scale (1=strongly disagree to 5=strongly agree) to arrive at a summative score and has four subscales (attitudes toward teamwork and collaboration in learning, positive and negative professional identity, and understanding other healthcare professions' roles and responsibilities). Two subscales (negative professional identity and roles and responsibilities) are reverse coded, thus higher scores indicate more positive attitudes toward interprofessional learning (McFadyen, Webster, & MacLaren, 2006). The study was granted exemption status by the University's Institutional Review Board (IRB). Table one provides details of the *Introduction to IPE* event. All students were in their first semester of their respective professional programs.

Pre-meeting activities	Students complete the pre-activity RIPLS
Weeks 1-11 2020	Students watch introductory video (4 minutes) about interprofessional collaborative practice developed by two of the authors (ST and JW), describing their clinical experience with members of the other profession.
Weeks 1-2 2019	Students arrange meeting times [face-to-face 2019; online 2020]
Meetings	Students introduced themselves using a “camera phone” icebreaker during the small group meetings, whereby students described themselves in relation to a meaningful picture already located on their camera phone.
Weeks 12-13 2020	
Weeks 3-6 2019	Students then completed a brief interview with each other using the following questions: (1) Why are you pursuing a career in occupational/physical therapy?; (2) What do you know about OT/PT? (OT answers about PT, PT answers about OT); (3) During your observations prior to entering school, did you observe an OT and PT working together? What type of interaction was it? How did the OT/PT team work together, yet still address their unique scope of practice?; (4) If no one observed a PT/OT team, then how do you think OT and PT would collaborate in the clinical setting?
Post-meeting	Post-meeting students completed a reflection assignment. Both groups of students (2019 and 2020) responded to the same reflection questions. Questions included: (1) Summarize the ice-breaker and interview; (2) How has your knowledge increased about the OT or PT profession?; (3) How has your knowledge increased regarding interprofessional collaboration?
Week 14 2020	
Week 7-8 2019	Students then completed a Post-RIPLS survey to gauge change in attitudes to interprofessional learning.

Table 1. Description and timeline of Interprofessional Education Event

Data Analysis

The Wilcoxon signed-rank test performed descriptive statistics (frequencies, means, standard deviations) and quantitative statistical analysis of the pre-and post-score RIPLS. Mann Whitney U was completed to compare test scores across cohorts. The p-value for statistical significance was set at $p < 0.05$. Statistical analyses were computed with SPSS 26® (IBM Corp, Armonk, New York). All authors read all the de-identified post-learning reflections focusing on comparing cohorts for recurrent and new themes.

Results

In 2020, a total of 65 DPT ($n=45$) and OTD ($n=20$) students fully completed both the pre- and post-surveys (overall response rate 81.3%). The response rate for the 2019 cohort was 63.7% and demographics were reported previously (Trojanowski et al., 2021). Additional demographics are located in Table 2.

	Age (years)	Gender n(%)	
	Mean (SD)	Male	Female
Entire Sample ($n=123$)	24.0 (3.0)	35 (28.5%)	88 (71.5%)
PT ($n=90$)	24.0 (2.9)	29 (32.3%)	61 (67.8%)
OT ($n=33$)	24.1 (3.3)	6 (18.2%)	27 (81.8%)
2019 ($n=58$)	23.6 (2.4)	13 (22.4%)	45 (77.6%)
PT ($n=45$)	23.6 (2.6)	11 (24.4%)	34 (75.6%)
OT ($n=13$)	23.5 (1.6)	2 (15.4%)	11 (84.6%)
2020 ($n=65$)	24.4 (3.5)	22 (33.8%)	43 (66.2%)
PT ($n=45$)	24.3 (3.2)	18 (40.0%)	27 (60.0%)
OT ($n=20$)	24.5 (4.0)	4 (20.0%)	16 (80.0%)

Table 2. Demographics of the Sample

	Both Years						2019						2020					
	Entire Sample (n=123)		PT (n=90)		OT (n=33)		Entire sample (n=58)		PT (n=45)		OT (n=13)		Entire Sample (n=65)		PT (n=45)		OT (n=20)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Total RIPLS	84.3 (7.4)	86.9 (6.8)	84.7 (7.2)	88.0 (6.2)	83.3 (7.8)	84.4 (7.6)	85.8 (7.4)	87.1 (7.1)	85.8 (7.6)	87.6 (6.8)	86.0 (7.4)	85.9 (8.2)	83.7 (7.3)	86.8 (6.7)	84.2 (7.0)	88.2 (5.9)	82.7 (8.0)	83.7 (7.4)
Teamwork subscale	41.2 (3.7)	42.5 (3.4)	41.3 (3.7)	42.7 (3.4)	41.1 (3.7)	41.9 (3.6)	41.0 (3.9)	42.0 (3.7)	40.8 (4.0)	41.7 (3.8)	41.6 (3.5)	42.9 (3.4)	41.5 (3.5)	43.0 (3.1)	41.8 (3.4)	43.8 (2.5)	40.8 (3.8)	41.3 (3.7)
(-) professional identity subscale	13.3 (2.1)	13.6 (1.8)	13.3 (2.1)	13.8 (1.7)	13.3 (1.9)	13.3 (2.0)	13.8 (1.3)	13.8 (1.6)	14.0 (1.1)	14.0 (1.4)	13.3 (1.6)	13.3 (2.1)	12.9 (2.4)	13.5 (2.0)	12.7 (2.6)	13.6 (2.0)	13.3 (2.1)	13.2 (1.9)
(+) professional identity subscale	17.5 (2.3)	18.1 (2.1)	17.4 (2.3)	18.2 (2.2)	17.6 (2.2)	17.8 (2.1)	17.2 (2.6)	17.6 (2.3)	16.9 (2.8)	17.5 (2.4)	18.2 (1.7)	18.0 (2.0)	17.8 (1.9)	18.5 (1.8)	18.0 (1.7)	18.9 (1.6)	17.2 (2.4)	17.6 (2.1)
Roles and Responsibilities subscale	12.0 (1.8)	12.3 (1.9)	12.1 (1.9)	12.5 (1.8)	11.7 (1.6)	11.9 (2.3)	12.9 (1.2)	13.1 (1.4)	13.0 (1.1)	13.3 (1.4)	12.5 (1.9)	12.3 (1.2)	11.6 (1.9)	11.8 (2.0)	11.7 (2.1)	11.9 (1.8)	11.6 (1.5)	11.7 (2.6)

Table 3. Readiness for Interprofessional Learning Scale (RIPLS) Total and Subscale Score for Entire Sample OTD and DPT Students 2020

All scores report as mean (SD).

Utilizing Mann Whitney U, the cohorts demonstrated no statistically significant difference when comparing the 2019 and 2020 pre-test ($p=0.229$) and post-test ($p=0.626$) RIPLS scores. Both cohorts demonstrated a statistically significant increase when comparing pre- to post-testing using Wilcoxon Signed Ranks Test. When analyzing both cohorts, using the Wilcoxon Signed Ranks Test, there was a statistically significant increase in the pre- to post-RIPLS score from 2019 to 2020 in the entire sample ($p<0.001$) and the DPT students ($p<0.001$), but not the OTD students ($p=0.425$).

Analysis of post-event reflections demonstrated several themes which were similar across the two cohorts including personal experiences influenced career choice;

observation experiences shaped understanding of interprofessional collaboration; the two professions have similarities and differences; and looking forward to future opportunities. Additional themes for 2020's cohort included OT students expressing feelings of power imbalance within the group (one OT student with two to three PT students per group). In addition, themes related to the pandemic (i.e., changes in learning modes, communication methods) were also discussed. Refer to Table 4 for illustrative quotes representing each theme.

Discussion

This study aimed to compare the outcomes across two cohorts of first-year OTD and DPT students participat-

Theme	Illustrative Quotes
Influence of COVID-19 pandemic. (New theme from 2020 cohorts)	OTD Student: <i>The COVID-19 pandemic has not only drastically changed how we communicate and collaborate with each other; it has shown just how important communication is between people.</i>
	OTD Student: <i>My group and I all believed that the IPE modules that we were tasked to complete this semester did help our understanding of the roles in healthcare, and we all wished that we could work together in-person rather than virtually, but due to the circumstances we were understanding.</i>
	OTD Student: <i>Due to the pandemic, our time on campus and collaboration with one another has been limited. I thought that the ice breaker at the beginning of the meeting was nice because we had a chance to learn more about one another and talk about topics outside of school. It was nice to see just how much we had in common...even though we were in different graduate programs.</i>
	DPT Student: <i>The interview we had went way better than I initially thought it would go, we automatically started talking about school, lab courses, while knowing that we all are going through the same courses together. We started chatting about classmates, and how we are adjusting in the ongoing pandemic with switching to all online courses etc. It was all a very natural conversation and I realized we all felt the same which made us connect right off the bat.</i>
More DPT students than OTD students (power imbalance; new theme from 2020 cohorts)	DPT Student: <i>First we participated in an ice breaker game to get to know each other. Since COVID has taken away so many opportunities for interpersonal communication this year, it was nice to be able to talk with fellow students and learn more about their life outside of school.</i>
	OTD Student: <i>I was nervous for this meeting. I had not gotten the chance to interact with the PT students prior to this assignment, so I was unsure of how their culture would be different from my OT cohort, especially since there were three of them and only one of me. I think the icebreaker helped ease my nervousness...[It] helped remind me that they were also nervous about this assignment, giving us something in common besides the obvious of all of us being passionate about healthcare and wanting to help others.</i>
	OTD Student: <i>To be honest, I was getting worried I would feel left out for the remainder of the meeting because the two of them knew each other prior, and both of them are in the same program. However, I had the opposite experience.</i>

Table 4. Summary of Themes and Illustrative Quotes taken from 2020 Reflection Papers

ing in a face-to-face mode versus online delivery of the *Introduction to IPE activity*. Both groups statistically improved their attitudes towards IPE as measured by the RIPLS. Reflections of the event were similar in both groups. Two additional themes emerged in 2020: (1) the pandemic resulted in additional conversations about their educational experiences; (2) uneven group sizes resulted in a feeling of power differentials among OTD students.

COVID-19 has impacted every level of education and it is not surprising that students reflected on ways the pandemic influenced their education. Students also described how the pandemic has drastically changed communication and collaboration. Students acknowledged the disruption the pandemic created in their education and their ability to engage socially and in non-formal ways. With that, COVID-19 has created emotional challenges for graduate students, with students reporting an impact on psychosocial function (Lopez-Castro et al., 2021). Sharing these emotional experiences can generate bonding and a unique platform to relate to one another because of the shared experiences of graduate school during the pandemic.

The second new theme between cohorts was a power imbalance due to more DPT students than OTD within the groups. Occupational therapy students described the hesitance in initiating the *Introduction to IPE activity* due to the discrepancy in numbers and prior relationships formed by the physical therapy cohort that would make up their groups. Because of this imbalance, OT students were in a minority position and could have led to feelings of intimidation and an inability to express ideas freely. Perceptions of feeling like an outsider quickly dissipated as both disciplines participated in the ice breaker activities and found commonalities personally and professionally. While OT and PT share similar roles and responsibilities, each profession has its unique identity. Research on power imbalances during interprofessional education has focused on relationships between nursing and medical or physician assistant students (Engel, 2017; Furr, 2020). Power imbalances have impacted patient safety (Brandis, 2017) and with whom a provider chooses to collaborate (McDonald, 2012). However, this is an area that has been understudied in interprofessional research (Paradis & Whitehead, 2015).

During the pandemic, online collaboration has shown

positive results (Kolm et al., 2021) and could be used to facilitate interprofessional collaboration amongst health care professionals. The preparation for performing online work and collaboration can be added to graduate degree programs to develop skills early on. When students were educated online, students expressed an ability to work towards a common goal, communicate purposefully, and share responsibilities on a project (Kolm et al., 2021). Technology has its challenges. In a study by Nicklen et al. (2016), physical therapy students felt technology was “risky” to use because of its unpredictable nature, creating communication challenges. A plus is it does offer flexibility. Because our IPE design gave students a two-week time window to complete their interviews, this gave more flexibility to students in case of technical difficulties.

Limitations

While the RIPLS demonstrated a statistically significant improvement between pre-and post-measures in both cohorts, it is unlikely that the change was meaningful. The total RIPLS scores were greater than 80 pre-and post-event in both cohorts. The maximum total score on the RIPLS is 95. Students had an overall positive attitude toward IPE, even before the event. This is consistent with previous studies that describe minimal change on the RIPLS (Trojanowski 2021; Rose 2009; Turkelson 2018), with some studies suggesting students are already ready for interprofessional learning when they begin their professional programs, as demonstrated by a ceiling effect with the RIPLS (Torsvik 2021). Despite a lack of quantitative improvement in the *Introduction to IPE learning activity*, the students recognized that they have more learning to do in the IPE arena.

Conclusion

Online IPE activities are a feasible method to deliver IPE content. Results were similar when comparing an established IPE event’s face-to-face and online delivery methods for OTD and DPT students. As a result of the COVID-19 pandemic, educational disruptions emerged as a new theme with the online delivery method. Another new theme in the online delivery group is the power imbalance when student numbers are very uneven amongst groups. Future research is needed to explore power imbalances amongst OTD and DPT students and OT and PT professionals.

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Author Contributions

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

J.W.-Conceptualization, Project Administration, Writing-Original Draft;

S.T.-Conceptualization, Project Administration, Writing-Original Draft;

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