# The Use of Interprofessional Education (IPE) to Address Collaboration for Individualized Education Plans (IEPs): A Retrospective Study of Occupational Therapy, Speech-Language Pathology, and Special Education Students' Perceptions

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There are 7.1 million students in the United States (US) receiving special education (SPED) services through local public schools (National Center for Education Statistics [NCES], 2021). If a student qualifies for SPED services, then the provision of those services is mandated by the Individuals with Disabilities Education Improvement Act (IDEA; 2004). IDEA states that every child who qualifies for SPED services must have an individualized education plan (IEP). The IEP specifies special education services including accommodations, modifications, specialized instruction, and related services such as physical therapy (PT), occupational therapy (OT), and speech-language pathology (SLP). Professionals from these disciplines collaborate extensively in US public schools under the IDEA mandate. The development of the IEP requires a team approach based on data from assessments which include the child's current level of educational performance, a vision statement, and annual goals and objectives (Decker, 1992). Additionally, members of the IEP team include the caregiver and the student when they have reached a particular age mandated by their state. This collaborative cooperation is often referred to as Interprofessional Practice (IPP).

**Collaboration Through Interprofessional Education**

Collaboration is a cornerstone of service provision; accrediting organizations for OT, SLP, and SPED programs promote the inclusion of collaboration as part of their curricula (Accreditation Council for Occupational Therapy Education [ACOTE], 2018; American Speech-Language Hearing Association [ASHA], 2020; Council for Exceptional Children [CEC], 2015; Council on Academic Accreditation in Speech-Language Pathology and Audiology [CAA], 2020). These organizations define their standards using the *Framework for Action on Interprofessional Education & Collaborative Practice* from the World Health Organization (Interprofessional Education Collaborative [IPEC], 2016; World Health Organization [WHO], 2010), which clearly states that Interprofessional Education (IPE) is necessary to prepare a collaborative practice-ready healthcare workforce. IPE has been described as practitioners from two or more professions who engage in educational activities focused on learning alongside and about each other (Craddock et al., 2006; Portney, 2020). IPE consists of four main competencies: (a) mutual respect and shared values with individuals from other professions; (b) knowledge of the roles and responsibilities of one's own profession and other professions to improve outcomes for patients and populations; (c) effective communication among clients, families, communities, and other professions for health promotion and maintenance and prevention and treatment of disease; and (d) building relationships to foster team development and teamwork to plan, deliver, and evaluate effective timely, efficient, and equitable client care, population health, and policies (IPEC, 2016).

IPE is a successful educational approach that has traditionally been used with pre-service professionals (PSPs) in the field of healthcare to develop collaboration skills (Coppola et al., 2019; Fleischer et al., 2019) for the benefit of the patient (Craddock et al., 2006). PSPs who participate in IPE at some point during pre-service education tend to show positive attitudes towards teaming and work towards optimal outcomes for patients (Barker & Oandasan, 2005). IPE allows PSPs to share skills and knowledge between professions and allows the PSPs to develop understanding, shared values, and respect for other professionals' roles (Bridges et al., 2011). Healthcare professionals function well by participating in activities that are supported by positive contextual factors such as collaborative work environments. When collaborative practice takes place health outcomes are improved (Gorden et al., 2015). IPE has been typically focused on medical settings

(Coppola et al., 2019; Sylvester et al., 2017) but there is some research focused on educational settings (Paul et al., 2020; Rosa-Lugo et al., 2017).

Collaboration happens among in-service general education and SPED professionals in teaming structures. Interprofessional collaboration with professionals in the related service disciplines is increasing (Mellin, Bronstein, et al., 2010, Mellin, Taylor, et al., 2014), however, research on interprofessional training in pre-service programs is limited. Several studies on interprofessional collaboration obtained qualitative survey data describing participants' perceptions and experiences with collaboration in courses (Coppola et al., 2019; Schmedding-Bartley & Karasinski, 2020). As mentioned previously, accrediting organizations for OT, SLP, and SPED programs promote the inclusion of IPE and collaboration as part of their curricula. Through the provision of SPED services, these three professions collaborate extensively in US public schools. However, research has shown there are multiple barriers that inhibit collaboration among professionals in the public-school setting, including a lack of prior training (Ludwig & Kerins, 2019). Anderson (2013) investigated the perceptions of SPED PSPs regarding collaboration in the work environment and noted the following results: (a) PSPs did not understand each other's roles, (b) discipline-specific jargon created a barrier to collaboration, and (c) PSP's believed opportunities of interdisciplinary collaboration during pre-service training was limited. Therefore, training PSPs in these areas is crucial. By contrast, Paul and colleagues (2020) showed that a brief IPE experience positively affects PSPs' attitudes towards other professions in a school-based case study but did not report on whether the IPE experience also changed attitudes towards specific school-based collaborative skills. This current study not only assesses PSPs' attitudes towards IPP via a school-based case study but also their attitudes towards the IEP development process. This is the first study of its kind to examine both the effectiveness of an IPE workshop and the development of an IEP in pre-service training programs.

**Purpose of the Study**

The primary aim of this study was to investigate the programmatic effectiveness of IPE for training PSPs in the assessment of children with disabilities and significant backgrounds, and the development of the IEP in public educational settings. This type of training allows PSPs from three disciplines (i.e., OT, SLP, and SPED) to work collaboratively with the specific goal of preparing them to engage with each other as professionals to develop an IEP. The researchers from these three disciplines developed the content of the IPE training workshop collaboratively and served as facilitators during the workshop. The study seeks to answer the following research questions:
1. What is the effectiveness of the IPE workshop on PSPs' perceptions of their confidence when interacting with other disciplines?
2. What is the impact of the IPE workshop on PSPs' understanding of their role and each other's professional roles?
3. How do PSPs' perceptions of knowledge of IPE change as a result of the IPE workshop?
4. What are PSPs' perceptions of the IEP development process as a result of the IPE workshop?

## Methodology

**Theoretical Framework.** The researchers from the OT, SLP, and SPED departments developed the IPE training based on the theoretical frameworks of social constructivist learning theorists Vygotsky (1978), Bruner (1966), Dewey (1986), and Mezirow (1991), with an emphasis on the social construction of knowledge, problem-solving, and reflective learning processes. The activities developed for the workshop were derived from these constructivist pedagogical frameworks. According to Mezirow (1991), the construction of knowledge occurs when learners make meaning by interpreting and reinterpreting their experiences. The workshop participants had the opportunity to problem-solve challenges experienced by the child in the case study. PSPs engaged in social learning and constructed new information based on their knowledge, experience, and perspectives. In addition, the development of the IEP was a central active learning activity where social learning and constructive learning took place. Self-reflection and reflective thinking were critical in the workshop when participants answered open-ended questions about their experiences and developed joint goals and objectives for the IEP both within their discipline and with the other disciplines. In addition to adult learning principles, the current study also utilized the WHO (2010) *Framework Action on Interprofessional Education and Collaborative Practice* for shaping IPE and IPP. The current project utilized the following mechanisms: adult learning principles, compulsory attendance, contextual learning, logistics and scheduling, and program content (WHO, 2010).

**Research Design.** This study used a mixed-methods, retrospective, cross-sectional investigation of pre-post workshop surveys collected by the investigators during the spring 2020 semester to assess the effectiveness of the IPE workshop. PSPs were asked a series of questions consisting of quantitative rating scales and qualitative open-ended questions regarding their experiences. A convergent research design was used to combine the qualitative and quantitative data.

**Measures**. The primary aim of developing this survey was to assess programmatic effectiveness with regards to implementing IPE within the three professional training programs. The survey was used in this manner for at least four years prior to the data reported in this study. Content validity of the survey was achieved by having the survey evaluated by three external subject matter experts, which included a doctorate-level speech-language pathologist, school psychologist, and doctorate-level occupational therapist. These professionals were involved in the interactive and iterative process of the construction of the survey and were not directly involved with the current project in the years prior to this investigation. The authors of this study reviewed the survey, made slight changes to wording to improve clarity, and judged that it adequately measured the content it was designed to measure (program effectiveness) and that the questions were clearly written. The authors also added two open-ended questions that were not present in earlier iterations of the survey, allowing for the collection of PSPs' perspectives on the workshop, resulting in the formalized "The Interprofessional Education School-Based Survey" (IPESBS) presented in Appendix A.

**Participants**. The participants of the study consisted of a convenience sample of PSPs from the OT ($n = 33$), SLP ($n = 29$), and SPED ($n = 16$) programs. There was a total of 78 participants (female $n = 76$, male $n = 2$) and the group consisted of full-time students ($n = 64$) and part-time students ($n = 14$), graduate students ($n = 54$), and undergraduate students ($n = 24$). Participation in

the workshop was compulsory for each group as the workshop was a distinct activity included in each course. Additional demographic information is in Table 1.

**Table 1**

*Participant demographics*

| Discipline | *n* | Gender (Male) | Enrollment Status | Program of Study |
|---|---|---|---|---|
| Occupational Therapy | 33 | Female: 33 Male: 0 | Full-time: 31 Part-time: 1 No answer: 1 | Graduate: 10 Undergraduate: 23 |
| Speech-Language Pathology | 30 | Female: 30 Male: 0 | Full-time 30 Part-time: 0 | Graduate: 30 |
| Special Education | 15 | Female: 13 Male: 2 | Full-time: 2 Part-time: 13 | Graduate: 15 |

Students in the OT program were enrolled in a class focusing on pediatrics and the cohort contained a mix of graduate (10) and undergraduate (23) students. All the occupational therapy students were engaged in level-one fieldwork at the time of the workshop. Level-one fieldwork involves observing OTs in the field. Students in the SLP program were enrolled in a class focusing on evaluation and diagnostics. These PSPs were graduate students engaged in the first year of a program of study to prepare them as entry-level SLPs. In this cohort, three students were currently engaged in their first semester of practicum in the on-campus clinic. The remainder were not engaged in practicum at the time of the workshop, and all had completed the required 25 observation hours (American Speech-Language-Hearing Association, 2020). Students in the SPED program were enrolled in a class focusing on student behaviors and classroom management. These PSPs were completing the initial licensing program seeking state educational licensure in moderate disabilities. All SPED participants were currently working in the public schools as educators, such as classroom teachers in other areas or as instructional aids. After consultation with the Institutional Review Board (IRB), it was determined that the retroactive project was exempt from IRB approval as the data was collected to determine program effectiveness. Even so, participant identifying information was not collected, and all responses were anonymous.

**Procedure**. The IPE workshop took place at a small liberal arts and sciences university in central Massachusetts. The workshop's focus was to improve PSPs' perceptions of their confidence when interacting with other disciplines, understand their own roles and each other's professional roles, and develop knowledge about interprofessional collaboration skills and the IEP development process. The main purpose for collecting student data was to evaluate the IPE program and eventually inform and improve instruction. The IPE workshop was organized into two sessions in two consecutive weeks; each session was 3 hours long. The pre-post IPESBS were given to the

participants before the workshop on day one, then again at the end of the second day of the workshop. Participants were given an electronic link and asked to complete the IPESBS using their personal laptops during the workshop. All surveys were deployed using Google Forms, and responses were collected on Google Sheets.

**Workshop Design.** The workshop was designed to reflect current collaborative practices in a public-school setting. The participants were educated about the following IPP principles in their individual classes: (a) shared goals, (b) how to select a dedicated team facilitator, (c) defined roles for team members, (d) a plan for resolving conflict and effective team function, and (e) reflective practice (American Speech-Language-Hearing Association, n.d.). Shared goals were addressed via review of the case study and in-class discussion of assigned readings regarding the purpose of SPED services. Selection of a team facilitator was determined by the authors of the study; SPED teachers often chair IEP meetings, and as such they were assigned this role. Defined roles as team members were communicated through lectures outlining the role of each profession in SPED delivery. Communication as an IEP team member and IEP development was addressed in assigned readings and discussed in individual classes. Reflective practice was introduced via the pre- and post-IPESBS administration, which encouraged students to reflect on their experiences and synthesize them with their eventual roles in their respective professions. All PSPs across the three disciplines were assigned the same reading list and given a case study to analyze. These readings were selected to introduce PSPs to IPE concepts such as qualities of successful IEP meetings, team cohesion, and background knowledge pertaining to the case study.

The case described a fictional 9-year-old male in third grade in a public school. His personal background was significant for premature birth, neglect, and recent medical trauma in his immediate family while he was living with his grandparents. His educational performance was significant for difficulty meeting grade-specific benchmarks, poor academic performance, and behavioral and social-emotional issues. The case study is presented in Appendix B.

In addition, each investigator conducted in-class discussions which drew on material from the assigned readings and discipline-specific assessment results. Assessment materials used during analysis of the case study included the *School Function Assessment* (Coster et al., 1998) and the *Sensory Profile-2* (Dunn, 2014) described by the OT graduate students, the *Clinical Evaluation of Language Fundamentals—Fifth Edition* (Wiig et al., 2013) presented by the SPL graduate students, and SPED graduate students developed *Functional Behavior Assessments* (FBA) (Gresham et al., 2001). The PSPs discussed their respective findings, then collaboratively wrote IEP goals and objectives within their own disciplines and one interdisciplinary goal and objective. At the end of the workshop, the participants shared the interdisciplinary goal and objective with the larger group. The investigators led a debriefing discussion that included a questions and answers session. The workshop agenda is presented in Appendix C.

**Data Collection**. Data collection occurred on both day one and day two of the workshop. A total of 78 students responded to the pre-workshop IPESBS (OT $n = 33$, SLP $n = 30$, and SPED $n = 15$). Due to the onset of the COVID-19 pandemic response from the state government during the second day of the workshop attendance was significantly diminished. A total of 49 post-workshop responses were obtained (OT $n = 17$, SLP $n = 23$, SPED $n = 8$). The participants responded to the statements by rating them on a 5-point Likert scale indicating the degree to which they agreed (5)

or disagreed (1). The pre- and post-workshop IPESBSs were identical except the post-survey had two additional open response questions. Participants were asked to describe their assumptions, experiences with the collaborative process, and how participation enhanced their understanding of the IEP process. The entire survey took approximately 10 minutes to complete.

**Data Analysis.** The quantitative data were analyzed using a student's *t*-test for the overall pre- and post-IPESBS scores, and a Wilcoxon Signed Rank Test for comparison of individual questions using IBM SPSS Statistics (Version 27.0). The qualitative data were analyzed using a deductive approach to thematic analysis that utilized open coding based on phenomenological interpretations of the data in the participants' quotes. PSPs' open responses were read through multiple times by two of the authors to develop the codes manually. These two researchers grouped the codes into themes until no new themes were found and thematic saturation was reached. Then, inter-rater reliability was calculated between these two raters (Cohen's $k$ = 0.92), indicating excellent reliability. A third rater checked the codes from the first two readers with the raw data and possible investigator biases were identified. Feedback from the third reader was provided to the two original readers and the final codes and themes were the result of this process and are presented in Table 2. Confirmability was achieved through triangulation with the quantitative data to answer the research questions.

**Results**

The overall results included quantitative data from online IPESBS questionnaires before and after the IPE workshop and qualitative data from two open-ended questions. All disciplines showed an increase in perceptions and knowledge as a result of the workshop (OT: $t(32) = -3.851, p > 0.001$, Cohen's $d = 1.25$; SLP: $t(29) = -5.70, p < 0.001$, Cohen's $d = 1.58$; SPED: $t(14) = -2.12, p = 0.022$, Cohen's $d = 0.96$). Comparisons of pre-post workshop overall scores by discipline are listed in Table 3.

There were also significant increases in 10 out of 12 individual question scores from pre- to post-workshop IPESBSs. Two questions showed no significant difference in pre-post workshop data when asked about changes in their confidence in representing their profession and opinions on conflict resolution. The results are listed in Table 4.

**Table 2**

*Qualitative Data: Themes and Codes*

| Themes | Codes | Examples |
|---|---|---|
| Confidence | Self-efficacy | "My participation gave others in the group an idea about the role of the SLP in the schools…" <br> "I enjoyed the challenge of translating my knowledge of OT and my OT language" |
| | Different perspectives | "My participation enhanced my understanding of the…process because it helped me to see how other service providers address the various components in developing an IEP…" |
| New understandings of roles and responsibilities | Roles and responsibilities | "I really enjoyed working with other professions and learning what they focus on and their role in the IEP process and service delivery." |
| | Teamwork | "I learned that it really is a team effort…. This helped me to realize that all parts of the team are equally important and bring valuable information to the IEP." |
| Collaboration | Different perspectives | "The collaboration helped me understand what can be contributed…from SLP and from special education." |
| | Teamwork | "Learning how to collaborate with a group to create goals is a skill that all professionals who work in a school will need to acquire" |
| Preparedness | Communication | "…we all had different ideas, and it was nice to hear others [sic] thoughts." <br> "My participation enhanced my understanding of the IEP and referral." |
| | IEP development process and writing goals | "My participation enhanced my understanding of the…process because it helped me to see how other service providers address the various components in developing an IEP…" |

**Table 3**

*Pre-Post Workshop Comparisons by Discipline*

| Discipline | Pre-workshop mean (s.d.) | Post-workshop mean (s.d.) | *t*, *p* value | Effect size (Cohen's *d*) |
|---|---|---|---|---|
| Occupational Therapy | 2.96 (0.39) | 3.68 (0.69) | $t(32) = -3.85$, $p < 0.001$ | 1.25 |
| Speech-Language Pathology | 3.63 (0.39) | 4.26 (0.40) | $t(29) = -5.70$ $p < 0.001$ | 1.58 |
| Special Education | 3.81 (0.58) | 4.31 (0.45) | $t(14) = -2.12$, $p = 0.022$ | 0.96 |

**Table 4**

*Pre- and Post- Workshop IPESBS Comparisons by Question*

| IPESBS question | Pre-workshop mean (s.d.) | Post- workshop mean (s.d.) | Sig. ($p \leq 0.05$) | Effect size (Z) |
|---|---|---|---|---|
| What is the effectiveness of the IPE workshop on PSPs' perceptions and knowledge of the IEP development process? | | | | |
| 6. Comfort with professional role. | 3.52 (0.87) | 3.93 (0.65) | 0.01 | 2.57 |
| 14. Writing the referral plan with the group was a positive experience. | 3.91 (0.92) | 4.32 (0.71) | 0.002 | 3.13 |
| 18. Preparedness to work with other disciplines. | 3.78 (0.90) | 4.36 (0.71) | <0.001 | 4.43 |
| What is the impact of the IPE workshop on PSPs' understanding of each other's professional roles? | | | | |
| 7. Collaboration opportunities | 2.0 (1.14) | 3.12 (1.20) | <0.001 | 3.49 |

| | | | | |
|---|---|---|---|---|
| 8. Familiarity with the role and responsibilities of the related service professionals. | 3.37 (0.94) | 4.06 (0.71) | <0.001 | 3.57 |
| 9. Familiarity with the role and responsibilities of the classroom teacher. | 3.74 (0.93) | 4.16 (0.73) | 0.007 | 2.68 |
| 13. Comfort with own role in an interdisciplinary group. | 2.92 (0.99) | 3.89 (0.76) | <0.001 | 4.50 |

How do PSPs' perceptions of knowledge of IPE and the IEP development process improve as a result of the IPE workshop?

| | | | | |
|---|---|---|---|---|
| 10. Familiarity with the creation of academic goals. | 3.07 (0.90) | 3.87 (0.77) | <0.001 | 3.86 |
| 11. Familiarity with the creation of functional goals. | 3.17 (0.94) | 3.93 (0.76) | <0.001 | 4.19 |
| 12. Familiarity with the process of collaboration. | 3.0 (1.03) | 3.97 (0.77) | <0.001 | 4.32 |
| 15. Effective communication. | 3.41 (1.06) | 4.22 (0.76) | <0.001 | 4.02 |
| 16. Comfort with representing own profession. | 3.97 (0.98) | 4.06 (0.95) | 0.18 | 1.37 |
| 17. Ability to resolve conflict was perceived as "easy". | 4.11 (0.87) | 4.20 (0.83) | 0.105 | 1.62 |

The four themes identified in the qualitative analyses were increases in confidence, understanding of roles and responsibilities, collaboration, and preparedness. The themes and their associated codes are presented in Table 2. There was an intersectionality of the codes among the themes. For example, the themes of roles and responsibilities and collaboration were both supported by the teamwork code.

**Integrated Results by Research Question**. The first research question was, "What is the effectiveness of the IPE workshop on PSPs' perceptions of their confidence when interacting with other disciplines?" Comparisons from pre- to post-workshop IPESBS showed an increase in PSPs' overall perception of their confidence to work with other disciplines in the creation of an IEP ($Z = -2.57, p < 0.001$). However, PSPs did not perceive significant changes in their ability to represent

their profession better ($Z = 1.37$, $p = 0.18$). Despite this, the qualitative responses revealed that PSPs felt that they could represent their professions via adopting *different perspectives* and *self-efficacy*. The narratives provided by the PSPs revealed the theme of *increased confidence*. One PSP commented, "I know that I was not afraid to ask questions about the knowledge and terminology that my collaborative team possessed." Participants had the opportunity to communicate with individuals from other disciplines which was challenging at times.

***Different Perspectives.*** PSPs reported that by engaging in the workshop they gained new appreciation for the perspectives of other team members which increased their confidence. For example, one PSP reported, "My participation enhanced my understanding of the…process because it helped me to see how other service providers address the various components in developing an IEP…." The code of different perspectives appeared frequently throughout the qualitative data, reflecting how PSPs perceived the importance of communication during the workshop. As one PSP stated, "I enjoyed the challenge of translating my knowledge of OT and my OT language into language that can be understood by everyone in the group." Another PSP noted, "Working in a collaborative team helped with the group process because we all had different ideas, and it was nice to hear others' [sic] thoughts." Overall, different perspectives emerged as an important code in the reflections from the PSPs.

***Self-Efficacy.*** Participants reported perceptions of increased self-efficacy in their qualitative responses. "My participation gave others in the group an idea about the role of the SLP in the schools…" wrote one participant. In addition, one PSP indicated, "I was very impressed with my own ability to advocate for my professions' viewpoint and feel as though I have become a more competent student practitioner."

The second research question was, "What is the impact of the IPE workshop on PSPs' understanding of their role and each other's professional roles?" Comparisons from pre- to post-workshop IPESBS showed an increase in their familiarity with the roles and responsibilities of the classroom teacher in the classroom setting than they were before the workshop ($Z = -4.01$, $p = 0.001$). Qualitative comments from PSPs support the theme of *new understandings of roles and responsibilities of other disciplines* through *teamwork*.

***Roles and responsibilities.*** "I really enjoyed working with other professions and learning what they focus on and their role in the IEP process and service delivery" on participant reported. Another comment from a PSP noted, "I was happy to learn about the roles of OTs and special education teachers working with students. I enjoyed collaborating with everyone and representing my profession made me feel very proud." One PSP wrote, "The OTs and special education majors were very knowledgeable and really helped me understand their role and what kinds of goals they worked on." Another response included, "I really enjoyed working with other professions and learning what they focus on and their role in the IEP process and service delivery. I actually would like to do something similar again to get a feel for being on an IEP team and evaluating a student." Another PSP stated, "My participation gave others in the group an idea about the role of the SLP in the schools."

***Teamwork.*** "I learned that it really is a team effort.... This helped me to realize that all parts of the team are equally important and bring valuable information to the IEP," one PSP indicated.

Additionally, PSPs gained a new understanding of the importance of teamwork in the process, as one described:

> This process taught me to not only look at a case in terms of a client's communication, but to think of the whole person and their family, their education, their sensory integration, and their ability to do daily activities that are important to them.

Also, "It was interesting to hear different points of view from other disciplines. The collaboration was successful in facilitating teamwork."

The third research question was, "How do PSPs' perceptions of interprofessional education change as a result of the workshop?" The change between pre- to post-workshop IPESBSs demonstrated statistically significant increases in students' perceptions of knowledge of IPE ($Z = -4.32$, $p < 0.001$). In the qualitative data, the theme of *collaboration* was identified through *listening to different perspectives* and *teamwork*.

***Different Perspectives.*** One participant indicated, "I enjoyed listening to the perspectives of other professionals, especially the special education teacher, as she had prior experience in creating an IEP." Another PSP commented, "I now understand the interconnectedness and truly interdisciplinary approach of an IEP meeting after collaborating with my group." As one student stated, "The collaboration helped understand what can be contributed…from SLP and from special education." Another PSP said, "I found it beneficial to work with the SLP and education majors. I felt that hearing different ideas from their perspective was very insightful."

***Teamwork.*** By engaging in the IEP development process, the PSPs addressed the importance of teamwork as a component of collaboration. For example, PSPs said, "I learned that it really is a team effort.... This helped me to realize that all parts of the team are equally important and bring valuable information to the IEP." One PSP reported, "My participation contributed to the overall group process …" and another stated, "Learning how to collaborate with a group to create goals is a skill that all professionals who work in a school will need to acquire." One PSP even acknowledged that sometimes collaboration doesn't go as planned: "Mistakes were made; however, overall, I think that my group worked together to overcome these obstacles."

The fourth research question was, "What are PSPs' perceptions of the IEP development process as a result of the IPE workshop?" The perceptions of PSPs' knowledge about the assessments used in the development of the IEP also changed in a positive direction ($Z = -4.02$, $p < 0.001$). The qualitative analysis revealed the theme of *increased preparedness* to *develop an IEP* via *communication*.

***Communication***. PSPs again noted how communication was beneficial to their experience in the workshop and to developing an IEP. One PSP said, "... my input is crucial for the well-being of the client. I realized that what I recommend makes a difference and is a decision that can impact the client in many ways." Another reported, "My group had difficulty narrowing down many areas of deficits into one main goal but working together helped put together the areas of greater need." Of particular interest is this quote highlighting the importance of communication within the small groups to facilitate teamwork:

> Initially, I anticipated this to be a negative experience because we were all going to be meeting for the first time and then asked to work together as a team … We all

communicated our goals to each other and used our different knowledge to determine what would be best for the client. We discussed our concerns, the tests we wanted to administer, the areas we wanted to target, and the goals we needed to create.

The workshop resulted in satisfactory outcomes for another PSP as well, "[Our group] had positive communication [sic] in order to come to a decision that was best for [the client]." However, one PSP noted a limitation to the workshop objective of only writing treatment goals, "...because when people realized they were just responsible for goals or objectives, they did not talk amongst the group as much anymore."

***IEP development process and writing goals.*** PSPs reported a better understanding of the IEP development process, as well as the process for writing goals and objectives. One PSP reflected, "My participation enhanced my understanding of the IEP and referral process because it allowed me to bounce ideas off of professionals who view students with a different lens." Another PSP stated, "My participation enhanced my understanding of the special education plan since this workshop presented a scenario that is similar to experience in the real setting." Other comments included, "I believe we were able to create goals that are functional for the client's life and academic success." In addition, the experience of talking about the case study and the IEP process was new to some of the participants and PSPs learned to apply the assessment results into the IEP goal writing process. As a study participant noted, "We were all able to share our insight and what we thought was most important to address for goal writing, so we had a well-rounded list of strengths and weaknesses from different perspectives. Similarly, this benefited the group process."

However, some challenges in writing the IEP were noted. One PSP wrote, "...some students [PSPs] had minimal familiarity with the components of an IEP and how they are written, so it took a while to work through what (in the real world) would be background knowledge for most of the professionals." One special education student noted, "My participation contributed to the overall group process because I have experience working as a Special Education teacher. For example, I have written several IEPs already this year, so I was very familiar with the goal-writing process."

**Discussion**

In the mixed-methods, retrospective, cross-sectional investigation, the qualitative data complemented and supported the quantitative data. The qualitative themes provided a fuller picture of PSPs perceptions of the IPE competences and IEP process. Specifically, results in this study suggest the IPE workshop provided PSPs an opportunity to (a) improve the perception of their confidence by sharing their knowledge from their respective disciplines, (b) engage in professional discourse about their roles and learning about the roles of others, and (c) improve preparedness attitudes towards teamwork and communication in the IEP development process. PSPs' overall perception of their comfort in representing their profession remained relatively stable during the workshop. However, they felt more prepared to enter a similar IEP development experience, whether in their program of study or in their employment. They perceived confidence regarding their ability to advocate for their profession to best serve the needs of the client. They reported more of an understanding of the roles and responsibilities of the professionals involved in creating an IEP. And lastly, they reported that they better understood the value of collaboration in the IEP development process. The findings in this study also showed PSPs' increased perceptions of their confidence in their understanding of the IEP development process. Unlike other studies (e.g., Paul

et al., 2020) where participation was voluntary, the changes reported in this study were not likely the result of motivation since all participants were required to complete the workshop as a part of their respective courses. Overall, this study reflects the findings of several previous investigations which clearly demonstrated the benefits of improving students' collaboration with other disciples because of an IPE workshop (Coppola et al., 2019; Davidson et al., 2019; Fleischer et al., 2019; Rosa-Lugo et al., 2017).

On the quantitative survey questions, PSPs did not report a significant change in their ability to resolve conflict and there was no change in their confidence in representing their profession. In the qualitative data, the authors did not find specific themes or codes that referred to conflict resolution. In addition, the focus of the workshop was on collaboration skills and there was no instruction about conflict resolution. Although PSPs' perceptions about their ability to represent their profession were reported in the qualitative data, there were no significant differences reported in the quantitative data. Perhaps the PSPs were confident in their discipline specific knowledge prior to the workshop, and they were able to apply that knowledge during the workshop and therefore they reported a similar level in the post IPESBS.

As previously mentioned, all three disciplines represented in this study have requirements for engaging in the IPE workshop. IPE workshops can be used to foster a broader understanding of interprofessional practice and the roles of special education and related service professionals in higher education professional training programs. Students who are better informed regarding these issues could be more likely to engage in interprofessional practice when they enter the workforce, thereby addressing some of the barriers to IPP in the public schools (Ludwig & Kerins, 2019). The three disciplines represented in this study have mandates from their respective accrediting bodies to include IPE in their programs, with good reason. SLP programs are required to prepare PSPs for interprofessional collaboration and practice as outlined in the standards published by the CAA and ASHA. CAA accreditation standard 3.1B states that preparation programs must provide students with opportunities to experience interprofessional and collaborative practice in the areas of accountability, effective communication skills, professional duty, and collaborative practice (Council on Academic Accreditation in Audiology and Speech Language Pathology, 2020). The ASHA certification standard V-B 3.b states that applicants for the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP) must, "Manage the care of individuals receiving services to ensure an interprofessional, team-based collaborative practice," (American Speech-Language-Hearing Association, 2020). Similarly, the ACOTE (2018) clearly mandates (standard B.4.25) that OT students need to demonstrate "knowledge of the principles of interprofessional team dynamics to perform effectively in different team roles to plan, deliver, and evaluate patient and population centered-care" (Accreditation Council for Occupational Therapy Education, 2018, p. 33). Furthermore, the CEC (2015) SPED preparation standard on collaboration (Standard 7) states SPED professionals are expected to possess collaborative skills and knowledge to work with other educators, related service professionals and families and community members, to improve the progress of students with disabilities. Since all three professions emphasize the importance of collaboration it is imperative that preparation programs implement training to address such skills. Collaboration requires in-depth interprofessional interactions and exchange of interdisciplinary knowledge; an experience that can be introduced via the use of IPE workshops.

**Limitations and Future Directions**

The workshop was conducted in person and the post-workshop IPESBS data were collected during the second day of the workshop. On the second day of the workshop the state government announced a shutdown of all public schools and a suspension of many other public services and gatherings. Anecdotally, PSPs engaged in public education settings either via employment or in practicum settings reported that they did not complete the post-workshop survey due to the need to return to their classrooms to obtain materials as they pivoted to online learning. Other students did not attend the second workshop meeting due to health concerns. Therefore, there was attrition between the pre- and post-workshop IPESBS data (OT: pre-workshop, $n = 33$, post-workshop, $n = 15$, SLP: pre-workshop, $n = 29$; post-workshop, $n = 22$, SPED:  pre-workshop, $n = 15$, post-workshop, $n = 8$). A lower rate of study participant attrition might have provided different results. There was an uneven number of PSPs from each profession, possibly leading to imbalance discussions in the small-group activities. In addition, specific instruction and discussion in conflict resolution skills might be a useful addition to change PSPs perception of conflict resolution skills. Uneven prior experiences may have affected outcomes: There were a small number of PSPs who reported prior experiences with the IEP development process through their current jobs. Therefore, some students may have come to the workshop with work experiences that may have affected their learning in the workshop. The data are self-reported, and as such the conclusions drawn are limited by the PSPs own ability to reflect on their experiences. Lastly, since entire classes in each discipline participated in the workshop there was no comparison group in the study design and therefore this study did not control for external factors that may have influenced outcomes.

Future directions for the IPE workshop include additional instruction on conflict resolution skills, the inclusion of objective measures such as knowledge-based exams and assignments about IPE and the IEP development process to assess an actual change in knowledge and entry-level professional competencies, on-going training to ensure the PSPs have internalized and the used the skills, and follow-up with the workshop participants to determine if their attitudes towards IEPs and IPE translated into IPP in practicum placements and into their first jobs after graduation. The addition of a comparison group would permit further measurement of the effectiveness of the IPE workshop.

**Conclusion**

The results from this study suggested that the IEP workshop is a conducive avenue for PSPs from OT, SLP, and SPED programs to increase their perceptions of confidence, collaboration skills, and preparedness in developing an IEP and improve their understanding of other professions. This workshop format engaged PSPs in specific professional activities such as sharing evaluation information, communicating with their peers from other disciplines, and collaboratively writing explicit IEP goals and objectives. Training programs should develop opportunities for PSPs to engage in IPE opportunities to increase their knowledge of the roles and responsibilities of their collaborators in the public school setting and develop the skills necessary to engage in interprofessional practice in the workplace. One such opportunity that holds promise is the use of IPE workshops.

**Disclosures**

The authors receive a salary from their respective institutions. There are no non-financial conflicts of interest to disclose.

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## Appendix A

**Interprofessional Education School-Based Survey (IPESBS)**

Demographic Information:
1. What is your program? (Occupational Therapy, Special Education, Speech-Language Pathology)
2. What is your enrollment status? (Full-time, Part-time)
3. Level? (Graduate, Undergraduate)
4. Gender identification (Female, Male, Fill-in-the-blank)
5. Years of formal education (free text)

The following questions were answered with a Likert-like scale rating of 1- Strongly Disagree to 5- Strongly Agree:
6. I am comfortable with my professional role in supporting individuals with learning disabilities and sensory processing challenges.
7. In my educational setting, I collaborate with students from other programs often.
8. I am familiar with the roles and responsibilities of the related service professionals in the school setting.
9. I am familiar with the roles and responsibilities of the classroom teacher in the school setting.
10. I am familiar with the roles and responsibilities of the related service professionals in the development of the assessment plans.
11. I am familiar with the roles and responsibilities of the classroom teacher in the development of the IEP.
12. I am familiar with the creation of academic goals for the IEP.
13. I am familiar with writing functional goals for the IEP.
14. I am familiar with the process of collaboration.
15. I am comfortable in my role in an interdisciplinary collaborative group.
16. Writing the referral plan with the group will be a positive experience.
17. Communication among my group will be generally effective.
18. I feel I will be able to represent my discipline well during group discussion.

**Post-Workshop Qualitative Questions**
1. Please write about and comment on the parts of the experience that meant the most to you. You should include both positive and negative assumptions, experiences, and/or thoughts you had about the process. (open-ended)
2. As you consider your role on the collaborative team, describe how your participation 1) enhanced your understanding of the IEP and referral process and 2) contributed to the overall group process. (open-ended)

## Appendix B

**Case Study**

It is October and the start of the new school year, and you are new to the district. Casey is a 9-year-old male in 3rd grade who is new to the elementary school this year. He has been referred for a special education evaluation by his teacher because he is struggling academically. Casey's school files reveal Casey was born prematurely at 34 weeks after a difficult pregnancy for his single mom. He was placed in foster care with his grandparents at the age of 2 when his mom relinquished custody of him due to neglect. Since enrollment in the preschool program at age three, Casey has had difficulty with self-regulation, attention to task, and following classroom directions. Casey is noted to fall from his chair or be "fidgety" during center activities. This has negatively affected Casey's ability to follow classroom routines, finish his class work on time, and interact with his peers. Since then, he has had some struggles academically but has managed to meet his academic goals with support. Currently, he is having trouble not only reading short paragraphs but finding the meaning behind the story. The classroom teacher also notes that Casey often is holding his head to the side when reading or laying his head down on his desk, so the paper is close to his face when he is writing. His printing most of the time is difficult to read and Casey is often the last one to pass his paper in for writing assignments.

Casey enjoys reading books. His favorites are 'Green Eggs and Ham" and "Fox and Friends". He reads them fluently. However, he struggles with 3rd grade high frequency words such as "together, enough, laugh, thought, important" as well as tier 3 words. Since the 3rd grade ELA curriculum focuses on reading informational text Casey has difficulty meeting the ELA benchmarks, including reading, answering questions, and recalling facts. In his initial educational assessment at the beginning of the term he was reading at 45 words per minute and was able to recall 5 facts per minute. Casey is in the low reading group with two other students. They work with the reading specialist 2 times a week for 30 minutes each session in the resource room. The resource room is located next to his classroom to minimize issues during transition. The teacher wonders if Casey needs additional help with math. The school is using "Envision Math."

Casey enjoys gym class, lunch, and recess. In gym, he participates in all activities though he is usually the last one in the group to finish the exercise activities or to initiate participation in team games. He has not had difficulty following instructions from the Gym teacher though he does have difficulty finding his way back to the classroom once dismissed from gym. At lunch and recess, Casey has been noted to be very distracted and impulsive when carrying his tray or playing on school yard equipment resulting in teacher reprimands.

Casey can be social, but he is also somewhat socially awkward. The problem behaviors that Casey exhibits are out of seat and shouting out random things in class that have nothing to do with the task at hand. Casey will ask random questions, thereby interrupting his peers and/or his teacher. It is almost as if he cannot hold any thoughts in his head and that they must come out immediately or he will lose them. These behaviors can be very distracting. In addition, his question or comment is usually very poorly timed, interrupting the lesson. Usually, they are random and usually have to do something with dogs or Boy Scouts. Often his stories seem embellished in order to impress his peers and fit in, but they have the opposite effect because the students get annoyed with the

interruption and the obvious embellishment. The students in the classroom find him annoying, and as a result he is sometimes the target of bullying or ignored by his peers. Despite this, Casey comes to school friendly to everyone that he sees no matter what they did or said to him the day before.

Some staff in the building also find him annoying and are often very short with him and unaccommodating.  In the past month this behavior has gotten particularly worse since his grandfather was hospitalized for a week.  Casey was two years of age when he began living with his maternal grandparents after being removed from his parent's home for neglect. The hospitalization of his grandfather has had a significant effect on Casey's behavior with peers and in the classroom, as Casey's grandfather was the primary person to take him to Boy Scouts and other after school activities. Casey's grandmother is having difficulty getting Casey on the school bus on time as he complains of being car sick when riding the bus.  She has been driving him to school the past couple of weeks.

**Appendix C**

**Workshop Agenda**

| Time | Week 1: Individual Discipline Preparation: Discipline Role, Communication and Collaboration |
|---|---|
| 4:30 - 4:45 | Students organize into pre-arranged interdisciplinary teams |
| 4:30 - 4:45 | Welcome, pre-assessment survey, and team introductions |
| 4:45 - 5:05 | Literacy and language disorders |
| 5:05 - 5:25 | Effects of early adverse experiences and sensory processing disorder |
| 5:25 - 5:45 | Functional behavior assessment |
| 5:45 - 6:00 | Break |
| 6:00 - 7:15 | Interdisciplinary team discussion: Using the interdisciplinary worksheet<br>a. Work together in assigned groups to identify issues and behaviors that might be obstacles to school success<br>b. Present and document disciplinary assessment results |
| 7:15 - 7:30 | Wrap-up |
| | Week 2: Interdisciplinary Collaboration |
| 4:30 - 4:45 | Review of last week and plan for this week |
| 4:45 - 5:05 | Interdisciplinary insights on case study problem list |
| 5:05 - 5:30 | Discussion/Q&A |
| 5:30 - 5:45 | Break |
| 5:50 - 7:15 | Interdisciplinary team discussion: Complete page 1-4 of Massachusetts IEP as a team. Goals should include: one academic goal; one speech/language goal; one interdisciplinary social-emotional/behavioral; one occupational therapy goal |
| 7:15 - 7:30 | Wrap-up, workshop evaluations, and reflection handouts |