A Case-Based, Brief, Intensive Interprofessional Education Experience for School Practitioners

Rhea Paul, PhD
Elizabeth Simmons, MS
Donna Bowers, MPH
Patricia Carl-Stannard, MSW
Jamie Marotto, AuD
Kristin Rainville, EdD
Joan Sauvigne-Kirsch, EdD
Ellen Massucci, MA

Professionals from healthcare and education frequently work together to serve clients in public schools. We devised an interprofessional activity including students in occupational therapy, physical therapy, speech-language pathology, social work, and education in which students designed an interprofessional intervention program for a school child with complex needs. Allied health students who expressed interest in pediatric practice were recruited to participate. Students filled out the Interdisciplinary Education Perception Scale (IEPS), a Likert-scale measure of perceptions about related disciplines, before and after the experience. Quantitative analysis of responses on the IEPS showed a significant improvement in interdisciplinary perceptions after the experience as evidenced by higher IEPS scores. Qualitative analysis using a narrative thematic description of reflections on the experience confirmed this finding. These findings suggest a brief, intensive preservice interprofessional experience can have a positive effect on students' interprofessional attitudes, and points toward aspects of these experiences, including student-led discussions and small group conversations, that students find especially appealing. *J Allied Health* 2020; 49(1):e43–e50.

THE PUBLIC SCHOOL setting is a context in which professionals from health- and education-related disciplines frequently work together to serve clients. Occupational therapists (OT), physical therapists (PT), speech-language pathologists (SLP), social workers (SW), school nurses, and teachers are often involved in the interprofessional practice (IPP) for students with special educational and medical needs. These related services are required by students who have complex medical needs, social/emotional impairments, hearing impairments, disorders of feeding and swallowing, are nonverbal, or who struggle with the physical and cognitive demands of the academic curriculum and mainstream activity.

A large body of advocacy for the importance of providing IPP for the benefit of clients can be found in the literature of a variety of professions (e.g., DeVries,[4] Heassler,[6] Stone & Charles,[17] Wilson et al.[18]). But despite the expressed need for these collaborations and mandates from both federal law and local policy to provide team-based management of these needs in schools, many challenges are reported in implementing IPP (e.g., Brabek et al.[2]). These include trust, problem definition, goal identification, shared understanding and independent roles and responsibilities as among the obstacles. As recently as 2017, Griffin[5] described school-based IPP as "overwhelming and daunting."

Many governing and accreditation bodies that oversee educational preparation in the health and education professions explicitly stipulate interprofessional education (IPE) as a required component of pre-service training. Some literature supports the role of preservice IPE in mitigating barriers to IPP.[1,13,15,16] Nonetheless, there are numerous obstacles to IPE itself,[11,12,14] including coordination of schedules among departments, the need to address differing accreditation standards for each profession, and faculty credit allocations for IPE activities, among many others. Our institution is in a unique position to provide this training, as it houses all three rehabilitation professions (OT, PT, SLP), SWs, and teachers all on one campus, providing an opportunity to develop preservice interprofessional experiences. Our College of Health Professions has adopted a "menu" approach to IPE, offering a range of relatively short (2–3 hours), focused, participatory, extracurricular IPE activities throughout the academic year from which students are required to choose several to attend.

From the College of Education, College of Arts and Sciences, and College of Health Professions, Sacred Heart University, Fairfield, CT.

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Address correspondence to: Dr. Rhea Paul, Dep. of Communication Disorders, College of Health Professions, Sacred Heart University, 5151 Park Ave., Fairfield, CT 06825, USA. Tel 203 416 3950. paulr4@sacredheart.edu.

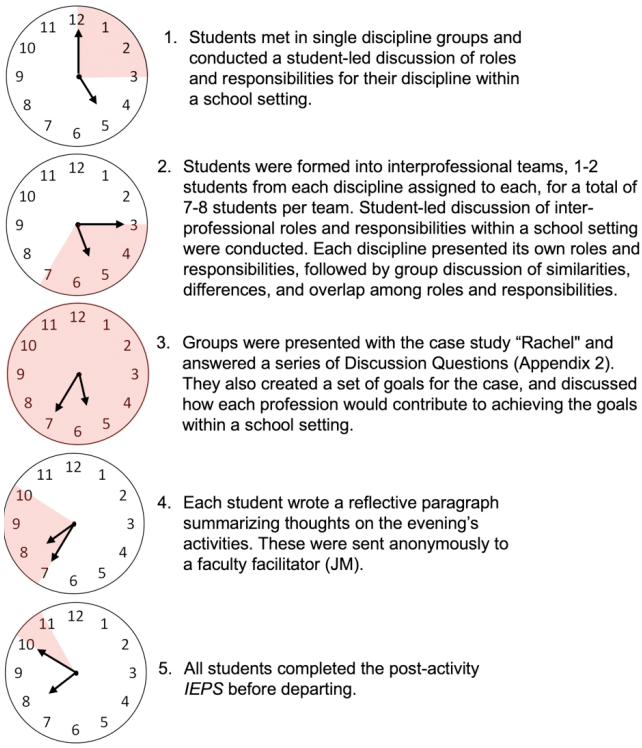

FIGURE 1. A timeline representing time spent on each activity during the interprofessional education evening.

The present project was designed to serve as one of this menu of activities.

The Interprofessional Education Collaborative (IPEC)[8] has developed a set of core competencies for IPP. The current investigation focused on the IPEC Competency #2: Roles and Responsibilities, which evaluates how knowledge of one's own role and the role of other professions can help guide clinical decision making. We hypothesized that our brief, intensive IPE experience would make a measurable difference in participating students' understanding and perceptions of their own and their colleagues' professional roles and responsibilities.

Methods

Participants

Thirty-five graduate students from a suburban liberal arts college participated in this study. They were recruited from five programs: education master's (n=4); OT master's (n=8); PT doctorate (DPT, n=8); SW master's (n=8); and SLP master's (n=7). An announcement of the IPP activity was sent to students who had expressed an interest in pediatric practice in the four clinical programs, and all students in the education program were invited. The sample was self-selected; all students who volunteered to participate were included in the study. This research was approved by the Sacred Heart University Institutional Review Board (IRB#190404A).

Procedures

Students who volunteered were emailed a link, hosted by Survey Monkey™, to an electronic version of the Interdisciplinary Education Perception Scale (IEPS)[9] to complete prior to the scheduled group activity. The IEPS was designed to evaluate allied health students' perceptions of their own profession and other allied health professions (Appendix 1). The scale includes 18 questions evaluated on a 6-point Likert-scale with higher scores reflecting more positive perceptions. The IEPS reports high reliability across all items (α=0.87, $p \leq 0.01$). The scale was chosen because it provides a quantitative metric for measuring constructs associated with IPEC Competency #2; i.e., allied health students' understanding and perceptions of their roles and the roles of others in related disciplines.

The 35 participants met during the early evening hours. Light refreshments were provided. A brief introduction that presented the purpose and sequence of events for the evening (Figure 1) was followed by the group activities. Data from the pre- vs post-event IEPS questionnaires were subjected to quantitative analysis. Students were asked at the end of the evening to type a brief paragraph describing their thoughts and opinions about the evening. They emailed these anonymously to one of the authors (JM) before leaving. A qualitative narrative thematic analysis was performed on these written reflections.

Materials

Interdisciplinary Education Perception Scale[9,10] (IEPS, Appendix 1). Each student participant anonymously and independently completed the IEPS 1–2 weeks prior to the activity and again immediately following the group activity. Mother's date of birth and profession were the only identifying information on the questionnaire and were used only to match pre/and post questionnaires to the same participant and to sort responses by profession.

Case Study: Rachel (Appendix 2). The case study was written collaboratively by the authors, with the aim to create a case that involved all the participating disciplines and presented students with a range of problems to consider and solve.

Results

Quantitative Findings

We conducted a repeated measures ANOVA on total scores from the IEPS (Table 1). Fixed effects included profession and time; participants were treated as random effects. A significant main effect of time (from pre- to post-event) across all professions was found on the IEPS total score (Figure 2). A main effect of profes-

TABLE 1. Repeated Measures ANOVA for Main Effects and Interactions

Variable	$F_{(1,56)}$	p	η^2
Profession	12.20	<0.001	0.28
Time	43.69	<0.001	0.32
Profession * time	0.92	ns	0.02

Eta squared calculated for effect size.

sion was also identified; this allowed us to compare scores among professions. Post-hoc analysis using Tukey's multiple comparisons with a correction based on the five group comparisons (Figure 3) revealed that the students in education scored significantly lower than the SLP, OT and PT, but not SWs, regardless of time point (NB: the number of students in this group was only 4, so results must be interpreted with caution). There were no significant differences among SLP, OT, PT, and SWs at either time point, nor any interactions between profession and time point. These data are displayed in the "violin plots" in Figures 2 and 3. Violin plots are similar to box plots, in that they display the average and interquartile range of the data, but they also show its probability density at different values by means of the thickness or shape of the plot.[7]

An analysis of change in scores on each individual item of the IEPS across all professions was conducted. On every item, scores increased from pre-event to post-event. *t*-Tests with a Bonferroni correction for multiple comparisons were computed. Criterion for significance in this analysis was set at $p<0.003$ (i.e., a p-level of 0.05 was divided by the 18 items in the IEPS). These results appear in Table 2. This analysis found significant improvement on scores for items 4, 9, 10, 16, and 18. The effect sizes seen for these five significant comparisons were consistently large.[3]

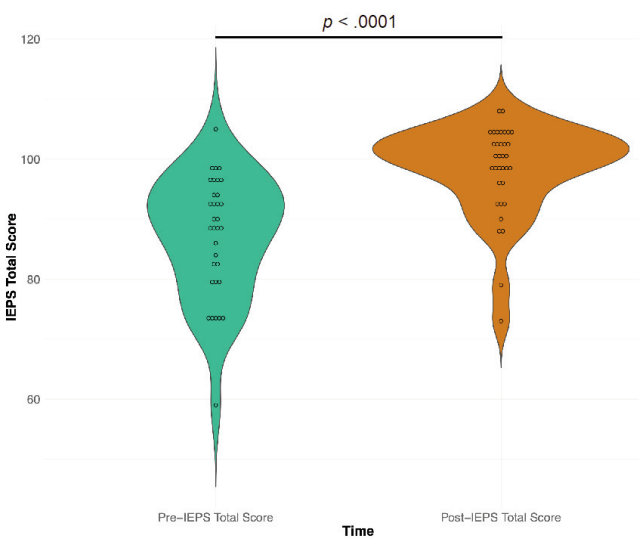

FIGURE 2. Violin plots illustrating the distribution of IEPS total scores over time.

Qualitative Findings

We analyzed the paragraphs written to reflect on the IPE evening's activities (students were not asked to answer specific questions in this activity, but to reflect on and express their thoughts about the evening). Using a narrative thematic approach, three of the authors (DB, JM, RP) independently read the reflections, then identified key ideas that were repeated in two or more of the responses. These ideas were listed and sorted into themes identified independently by the readers. All readers identified 3–4 similar themes. These were condensed to the three major themes most commonly identified among the three. This analysis revealed, first, that students expressed opinions about what they believed made this a good IPE activity; i.e., what they liked about the event.

Second, they talked about new perceptions they had about the advantages of interprofessional practice for the benefit of the client. Finally, they talked about how the activity affected their view of the professions with whom they collaborated, leading them to greater respect and trust of their IP colleagues, and how this new awareness also reshaped their view of themselves and their own professions. (NB: This was the theme most closely related to our aim of influencing IPEC Competency #2.) Table 3 provides example statements from the students' writing that elaborate each of these themes.

Discussion

To summarize the findings of this study, quantitative analysis revealed that, overall, the participants from all professions increased in their positive perceptions and understanding of their own and other professionals'

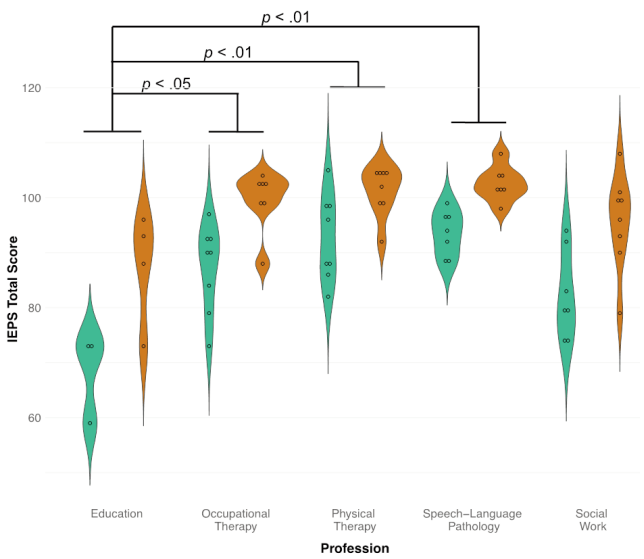

FIGURE 3. Violin plots illustrating the distribution of IEPS total scores by profession and time. *Green plots* show the pre-IEPS total scores, and *red plots* show post-IEPS total scores. Significant p-values from post-hoc testing using Tukey's correction are included in the figure.

TABLE 2. Descriptive and Inferential Statistics by Questionnaire Item

Item	Pre-IEPS		Post-IEPS				
	M	SD	M	SD	*t*	*p*	Effect size (*d*)
1	5.40	0.74	5.77	0.49	–3.67	0.015	0.62
2	5.14	1.24	5.80	0.47	–3.21	ns	0.54
3	5.06	0.87	5.51	0.89	–3.86	0.009	0.65
4	**4.57**	**1.07**	**5.57**	**0.65**	**–5.32**	**<.0001**	**0.90**
5	5.11	0.90	5.63	0.65	–3.57	0.020	0.60
6	5.59	0.61	5.94	0.24	–3.78	0.011	0.65
7	5.03	0.95	5.60	0.60	–4.15	0.004	0.70
8	4.71	1.20	5.31	0.93	–3.18	ns	0.54
9	**3.94**	**1.11**	**5.17**	**0.75**	**–6.86**	**<.0001**	**1.16**
10	**4.89**	**0.83**	**5.54**	**0.61**	**–5.08**	**<.0001**	**0.86**
11	2.83	1.34	2.91	1.63	–0.30	ns	0.05
12	4.71	1.03	5.40	0.81	–4.68	0.001	0.80
13	5.23	0.69	5.57	0.70	–2.10	ns	0.35
14	5.32	0.80	5.74	0.61	–2.98	ns	0.50
15	4.80	1.05	5.65	0.69	–4.81	0.001	0.82
16	**4.91**	**0.95**	**5.66**	**0.68**	**–5.38**	**<.0001**	**0.91**
17	5.23	0.84	5.66	0.68	–4.17	0.004	0.70
18	**4.71**	**1.05**	**5.49**	**0.78**	**–4.43**	**0.002**	**0.75**

Boldface indicates a significant change in IEPS score from pre- to post-IPE activity. Bonferroni correction was employed for multiple comparisons. Criterion was $p<0.003$ (0.05/18 item comparisons). Cohen's *d* (1988) was used to calculate effect size.

roles and responsibilities through interaction with this case, with few differences in improvement among professions. Item analysis of responses to the individual statements on the IEPS revealed that the individual items that showed significant improvement all centered around increases in positive views of the other disciplines in the activity and, perhaps more importantly, in each student's confidence that *other professionals valued his or her discipline reciprocally*, as well. This quantitative finding was supported by the qualitative analysis, in which students talked about the growth in mutual trust and respect among the professions, seen in their responses assigned to Theme 3.

In undertaking this small-scale study of IPE, we hypothesized that we would be able to make a difference in students' attitudes and perceptions about professional roles and responsibilities in IPP using a case-based, intensive, but brief activity that focused on a particular practice context (schools) with a fairly wide range of professions. The data collected in this study, while certainly not definitive, do tend to support this hypothesis. After only a 3-hour interaction among five different professions around a school-aged client with complex needs that affect a wide range of cognitive, motor, and sensory systems, our students showed significant overall improvement in their perceptions of IPP. Moreover, they talked in their reflective paragraphs about how IPP would help them to provide better service to clients through the exchange of ideas, getting input from beyond their own discipline, and having the opportunity to ask questions and learn from the expertise of other professions.

Quantitative item analysis of the IEPS responses showed significant change, and the items that drove the improvement all had to do with students' respecting and trusting other professions (Items 10, 16) and, perhaps more importantly, believing that other professions had reciprocal respect and trust for them (Items 4, 9, 18). Thus, the main outcome of the quantitative analysis seemed to consist of an increase in the belief that not only did each profession have positive views of the other disciplines in the activity, but also that other professionals valued his or her discipline reciprocally, as well. This quantitative finding was supported by the qualitative analysis. Theme 3, the theme students commented on most often, concerned issues of interprofessional trust and respect, as well, and the way these changed as a result of the IPE experience. It should be noted that the qualitative analysis was conducted before the quantitative one was performed and was done independently by different members of the team than those conducting the statistical analysis (ES). Thus, it is less likely that one set of results influenced the other.

In addition, the qualitative analysis gave us clear information about what students appreciated in an IPE activity through their Theme 1 discussion points. They liked the small groups (7–8 students comprised each interprofessional team in the activity). They liked not having a faculty member lead the group but to feel free to discuss and ask questions without fear of being "wrong." They liked focusing on a complex but real-life case, and they liked having the input of a fairly wide range of professions. These components would appear to be apt choices for developing similar IPE activities.

Limitations

This pilot study is clearly limited by the small number of participants in each professional group. A second limi-

TABLE 3. Statements Relating to Themes Identified in Qualitative Analysis

Theme 1 What makes a good IPE activity	Theme 2 Advantages of IPP for clients	Theme 3 Interprofessional respect and trust
Use small groups for open conversation	"It takes a village" to treat complex cases.	"I came to appreciate the unique perspectives each discipline brings to thinking about a case."
Use student-led groups without faculty supervision	IPE enables exchanging ideas; seeing the different perspectives each discipline brings to thinking.	"I enjoyed educating others about and representing my own profession."
Use case-based methods to make learning real world-relevant	IPP enables getting ideas about treatment that would not usually emerge from a single discipline.	"I learned deeply about other professions, so that I can make referrals more effectively."
Include as many different professions as possible	IPP leads to seeing areas of overlap between professions and the ways differences in perspective enrich practice; and to seeing value in multiple perspectives.	"I feel more confident about my own professional knowledge."
	Provides opportunities to ask questions of other professions without fear.	"I learned about the strengths/boundaries/similarities/differences among professions."
		"I enjoyed interacting with and feeling free to question and learn from other professions."

tation is the item content of the IEPS, which focuses mainly on IPEC Competency #2, on which we based our hypothesis. We chose this instrument because it specifically measures the rather small range of concepts associated with this competency; i.e., beliefs about autonomy, cooperation, interdependence, status, and respect within and among professions. Third, while improvements in the positive valence of these beliefs would appear to bode well for real IPP, we do not have any direct measure of change in participants' behaviors. We also do not know whether the gains made would persist over time. A fourth limitation concerns the self-selection of participants. It is possible that the students who chose to take part in the activity were already disposed toward interprofessional school practice, and so were willing to devote a whole evening to it. Students who were less inclined or motivated might not have shown significant change after such a brief experience.

Future research on a much larger group of students, including those that did not volunteer might yield different results. Studies that track changes longitudinally in both attitude and behavior over longer periods of time in students who did and did not receive specified "doses" of IPE during training are clearly needed to answer the practical questions raised by this pilot work.

Conclusions

A carefully designed, brief, intensive pre-service interprofessional experience that engages a range of disciplines all practicing in a common setting in considering a complex case that requires input from all present appears to have positive impact on the perceptions of students about their own and others' professions. These findings provide encouragement to training programs that face the universal problems of time and logistics in building interprofessional education into existing curricula. It doesn't take a whole semester's coursework to make a difference. A few well-planned hours can at least begin the process of building the interprofessional attitudes that can lead to improved collaboration for those we serve.

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APPENDIX 1. Interdisciplinary Education Perception Scale (IEPS)

INTERDISCIPLINARY EDUCATION PERCEPTION SCALE

PRE / POST

You will be asked to complete this at the beginning and end of your placement. Thanks for your assistance.

Mother's date of birth (To allow us to match the pre and post responses): _____

Using the scale below, (Strongly Disagree–1 to Strongly Agree–6) please rate your perception of your profession and other disciplines.

DESCRIPTOR	Strongly Disagree 1	Moderately Disagree 2	Somewhat Disagree 3	Somewhat Agree 4	Moderately Agree 5	Strongly Agree 6
1. Individuals in my profession are well-trained.	1	2	3	4	5	6
2. Individuals in my profession are able to work closely with individuals in other professions.	1	2	3	4	5	6
3. Individuals in my profession demonstrate a great deal of autonomy.	1	2	3	4	5	6
4. Individuals in other professions respect the work done by my profession.	1	2	3	4	5	6
5. Individuals in my profession are very positive about their goals and objectives.	1	2	3	4	5	6
6. Individuals in my profession need to cooperate with other professions.	1	2	3	4	5	6
7. Individuals in my profession are very positive about their contributions and accomplishments.	1	2	3	4	5	6
8. Individuals in my profession must depend upon the work of people in other professions.	1	2	3	4	5	6
9. Individuals in other professions think highly of my profession.	1	2	3	4	5	6
10. Individuals in my profession trust each other's professional judgment.	1	2	3	4	5	6
11. Individuals in my profession have a higher status than individuals in other professions.	1	2	3	4	5	6
12. Individuals in my profession make every effort to understand the capabilities and contributions of other professions.	1	2	3	4	5	6
13. Individuals in my profession are extremely competent.	1	2	3	4	5	6
14. Individuals in my profession are willing to share information and resources with other professionals.	1	2	3	4	5	6
15. Individuals in my profession have good relations with people in other professions.	1	2	3	4	5	6
16. Individuals in my profession think highly of other related professions.	1	2	3	4	5	6
17. Individuals in my profession work well with each other.	1	2	3	4	5	6
18. Individuals in other professions often seek the advice of people in my profession.	1	2	3	4	5	6

From Luecht R, et al.[9] Assessing professional perceptions: design and validation of an Interdisciplinary Education Perception Scale. *Journal of Allied Health*, 1990;19:181–191. Used with permission.

APPENDIX 2. "Rachel" Case Study

- Rachel is 10 years old; enrolled in the 4th grade.
- She has cerebral palsy, spastic quadriplegia, with the Gross Motor Function Classification Level IV.
- She operates a motorized wheelchair independently using a joy stick.
- She has bladder and bowel control but requires transfer assistance and help with toileting.
- She did not pass her hearing screening in Kindergarten; and was diagnosed with a mild sensorineural hearing loss. She uses an FM system in school.
- Rachel's speech is hard to understand; her parents would like her to try a voice output program on the iPad; but have not yet been purchased one due to financial constraints. Rachel becomes frustrated when her peers do not understand her speech.
- Fine motor deficits make her very slow to complete written work.
- Psychological testing revealed mild intellectual disability, but the psychologist is not sure that the score is valid, due to Rachel's difficulties in responding.
- Reading comprehension and spelling are at a 2nd–3rd grade level.
- Rachel has a word processing device, which allows her to type school work.
- Rachel takes part in P.E.; she moves around the playground quite freely in her wheelchair.
- Rachel wants to be part of all the class activities and is well liked by peers. She wants to be more involved in activities with her peers and is frustrated that she cannot do some of the projects in her art class because of her limited fine motor skills.
- She expresses sadness that she is so different.
- Frequently does not bring her homework back to school and tells her teacher "my mother said I didn't have to do it because I was too tired last night."

Discussion Questions:

1. What are the team's goals for Rachel during her fourth grade year?
2. Which team member will take the lead on each goal?
3. What methods and activities can be used to achieve each goal?
4. How can team members co-teach or otherwise collaborate to achieve these goals?