

# Outcomes of an Interprofessional Faculty Development Program on Knowledge and Value of Interprofessional Practice and Education

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## Abstract

**PURPOSE** Health professions programs have increasingly incorporated interprofessional education (IPE) and interprofessional collaborative practice (IPCP) into their curricula, but barriers exist, including a lack of faculty understanding and buy-in. It is important for faculty to see the value of IPE and IPCP and to have equivalent baseline knowledge to train students of all health professions from first year to graduation and beyond.

**METHODS** An interprofessional team of faculty from four institutions in central Washington engaged health professionals in a professional development program to foster role models in interprofessional collaboration for health professions students. This research explored the impact of attending a structured interactive professional development program on increasing knowledge and value of IPE. Pre- and post-program surveys were administered to health professionals who attended a 3-hour interprofessional faculty development program.

**RESULTS** The interprofessional program was associated with increased knowledge and value of IPE, as well as greater understanding and appreciation for tools available for IPE facilitation. Participating in this interprofessional program increases knowledge and value of IPE in the Washington health care professional community.

**CONCLUSION** This program may serve as a model for shifting cultures and views of IPE at other institutions committed to breaking down barriers associated with IPE and IPCP.

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## Implications for Interprofessional Practice

- An interprofessional faculty development program may help bridge the gap between the interprofessional education (IPE) students receive in their health professions curriculum and the interprofessional practice and collaboration (IPCP) students experience during their clinical rotations and/or in practice post-graduation by disseminating knowledge and value of IPE.
- The SWIPE Program is of much shorter duration (3 hours) than most interprofessional faculty development programs, ranging days to a year. The implication that a 3-hour workshop may produce outcomes similar to those of longer programs increases the convenience and value of attending continuing education programs, especially for preceptors/clinicians.
- Offering the SWIPE Program at no cost extends the reach of IPE and IPCP faculty development, particularly to adjunct and affiliate faculty in practice.
- By impacting the foundational knowledge and perceived value of IPE held by faculty and preceptors/clinicians, the SWIPE Program strives to positively impact the interprofessional culture in the classroom and the clinic with an ultimate goal to enhance patient care and outcomes.

## Introduction

The World Health Organization (WHO) identifies interprofessional education (IPE) as occurring when individuals from two or more professions learn about, from and with each other (WHO, 2010). The subject of team-based learning in the health professions was launched in 1972 when the Institute of Medicine (IOM) called for educating health professions students in teams (IOM, 1972). A series of subsequent IOM reports were offered between 2000 and 2003 (Kohn, Corrigan, & Donaldson, 2000; IOM, 2001; IOM, 2003) with each emphasizing a collaborative approach to improving health outcomes. Interdisciplinary learning and team-based delivery in the health professions, while not a new concept, is re-emerging as means to positively impact health outcomes and drive down costs (Bodenheimer & Sinsky, 2014).

Preparation of health professions students to engage in collaborative practice, however, remains limited in many health professions programs. Movement to an integrated IPE curriculum requires the commitment and support of community and institutional stakeholders. Stakeholders are those individuals, groups, or agencies with an interest in the mission and success of the developing IPE curriculum. They may be internal or external to the institution or collaborative and may include community clinical teaching learning partners,

students, faculty, staff, and administrators. Each stakeholder contributes to developing a culture of collaboration and a space allowing students to learn about, from, and with each other. Barriers to successful implementation of IPE curriculum include siloed professional programs with distinct accreditation and separate IPE expectations. Additional challenges may be attributed to individual program curricula as well as faculty limitations and resistance (Lawlis, Anson, & Greenfield, 2014; Mladenovic & Tilden, 2017).

Faculty buy-in, as well as knowledge of and experience with IPE and interprofessional collaborative practice (IPCP), is essential for moving programs from silos to collaborative partnerships within and outside the institution (Loversidge & Demb, 2015). Preparation to teach and engage in IPE is not common for most faculty and limited insight and negative attitudes about facilitation of interdisciplinary learning can serve as obstacles. Steinert (2005) suggested that successful IPE activities take place where practice is occurring and, through this approach, previously untapped clinical faculty may be identified. As with initial preparation for teaching, faculty need time to network with peers and community clinical partners. Additionally, they need supplemental training and preparation to effectively take an active role in supporting IPE. Faculty champions are fostered through professional development, and this investment in faculty demonstrates a commitment on behalf of in-

stitutional administration to support IPE. These faculty champions provide students with strong role models for interprofessional collaborative engagement.

The objective of this study is to assess changes in knowledge and perceived value of interprofessional practice and education in health professions faculty members and community preceptors after attending a three-hour interprofessional faculty development program, Success with Interprofessional Education (SWIPE) offered by the Yakima Valley Interprofessional Practice and Education Collaborative (YVIPEC).

## Methods

This study was reviewed and granted exempt status by the Washington State University Institutional Review Board with an interagency agreement with Pacific Northwest University and Central Washington University.

### *Study Design*

This was a prospective, multi-center, non-blinded, single-arm, non-randomized, pre/post design study.

### *Participants*

Study participants from four institutions affiliated with the YVIPEC and offering health care professional degree programs in the Northwest United States (Central Washington University, Heritage University, Pacific Northwest University, and Washington State University) were recruited from July 2017 to April 2019. Participants included health care professionals (faculty and preceptors) from a variety of fields (e.g., allopathic medicine, dietetics, paramedicine, nursing, osteopathic medicine, pharmacy, physician assistants, and public health).

Professional faculty is defined as an active teaching employee of a health professional program and professional preceptor is defined as a practicing employee of a health profession in the community who teaches health professions students in a clinical setting (e.g., hospital). Faculty were excluded from study participation if they were actively involved in the YVIPEC Faculty Development Committee and/or the SWIPE Faculty Development Program.

Eligible participants were invited to attend a SWIPE Faculty Development Program offered two times per year (first offered September 2017). Invitations were sent via email and follow-up emails were sent to interested health care professionals to confirm registration. Additionally, day-of-event registrations were permitted.

### *Faculty Development Program / Intervention*

The SWIPE Faculty Development Program (SWIPE Program) was designed and implemented by faculty members in the fields of pharmacy, dietetics, nursing, and osteopathic medicine from YVIPEC partner institutions who attended a Train-the-Trainer (T3) Interprofessional Faculty Development Program (Summerside et al., 2018). The 3.5-day T3 Program provided the tools, skills, and coaching needed to develop the pursuant SWIPE Program. The three-hour SWIPE Program provides background on IPE concepts and delivers tools and methods through an interactive curriculum for participants to facilitate IPE with health professions students back in their respective classrooms and practice sites.

The program includes various liberating structure teaching strategies and tools (Liberating Structures, n.d.). The five main components of the program include:

1. PDSA Cycle – Plan, Do, Study, Adjust – an action-oriented learning method for testing a change by planning it, trying it, observing results and other sources, and acting on what is learned.
2. 25/10 Crowd Sourcing – a tool that can be used to rapidly generate and sift through a group's most powerful ideas.
3. TROIKA Consulting – a quick “round-robin” consulting method where one individual asks for help and advice from two others who are actively listening for concepts that may be unclear or steps that may need to be taken in order to be successful.
4. Sand in the Machine – an activity to help individuals identify hidden discrimination, or implicit bias.
5. Case Facilitation – an activity that provides an opportunity to practice facilitating interprofessional case discussions.

### *Funding*

Three continuing education credit hours were available to attending participants at no cost. The YVIPEC covered the required costs to NCIPE for accrediting the SWIPE Program with the ability to offer attending participants three interprofessional continuing education credit hours. YVIPEC also provided funding for facility, food, and material costs associated with delivering the SWIPE Program. The research team did not receive external funding from any agencies in the public, commercial, or not-for-profit sectors.

### *Outcomes*

The primary outcome of the study was change in knowledge and perceived value of IPE from baseline to end of program. Participants were administered pre- and post-SWIPE Program surveys to assess change in IPE knowledge, skills, and abilities based on a six-point Likert-scale. The survey explored factors including, but not limited to the extent of current knowledge of IPE; perceived value of IPE; understanding of other health professionals' roles; and level of comfort in using IPE facilitation tools.

The post-program survey also collected open-ended responses. The participants' comments were analyzed as an exploratory outcome. Two investigators (APK, NRS) independently categorized the comments into themes, resolving any disagreements by consensus. Examples of participants' responses were selected to illustrate each theme.

### *Statistical Analyses*

Data were imported from EXCEL database into SPSS v25.0 software (IBM Corp.). Baseline summaries were performed both overall and by study cohort using frequencies and percentages. Percentages were expressed per non-missing values and compared for distributional equality amongst cohorts via Fisher's exact tests. In the presence of overall significance ( $p < 0.05$  via two-sided testing), post-hoc Bonferroni adjusted  $z$ -tests were performed to determine specifically which of the subcategories was statistically distinguished amongst the cohorts. The mean differences in survey outcomes from baseline to post-program study time points were determined as post-program value minus baseline value. They were tested for equality between

the four cohorts using a single-factor ANOVA. Statistical insignificance implied an inability to distinguish the uniqueness of any cohort results; hence mean summaries were presented aggregated across the study cohorts.

The changes from baseline to post-program study time points were tested for mean equality to zero via paired samples Student's  $t$ -tests for all participants with non-missing data values at each time point. Cohen's  $d$  effect sizes were calculated to measure the relative influence of the intervention independent of sample size. A table with 95% confidence intervals was constructed to display the mean differences in each of the outcomes from baseline to post-program study time points.

### **Results**

Forty-eight professionals involved in health care from four cohorts participated in the SWIPE Program between September 2017 and April 2019. Of the 48 participants who attended a SWIPE Program, 45 completed the pre-program survey and 47 completed the post-program survey, with 44 having completed both the pre- and post-program surveys. Table 1 lists baseline characteristics of all participants, with missing data indicated in its own category. Professions represented by study participants included pharmacy (26.7%), nursing (17.8%), medicine (15.6%), dietetics (11.1%), and physician assistants (8.9%). Slightly more than half of all participants (58.5%) were previously involved in facilitating interprofessional activities with students in the classroom or in practice, ranging from one to >15 activities total. There were no significant differences between the study cohorts and the participants' professional degree or extent of experience facilitating IPE activities ( $p > 0.05$  for each).

Single factor ANOVA with an effect for study cohort was not significant for the change from pre- to post-program time points in any of the outcome measures ( $p > 0.05$  for each); hence, results are presented in aggregate. Overall, there was an increase in perceived change in knowledge and value of IPE after participating in the SWIPE Program (Table 2). Compared to baseline, significant changes were observed for all items post-program, except Factor 2 item 5 "I feel that working with care providers of professions other than my own can improve outcomes" ( $p = 0.09$ ).

Variable/Statistic	Study Cohorts				Total (n=48)	P-value
	September 2017 (n=22)	January 2018 (n=8)	October 2018 (n=10)	April 2019 (n=8)		
<b>Profession – n (%)</b>						0.07
Pharmacy	4 (21.1)	4 (50)	4 (40)	0	12 (26.7)	
Nursing	2 (10.5)	1 (12.5)	3 (30)	2 (25)	8 (17.8)	
Medicine	3 (15.8)	0	2 (20)	2 (25)	7 (15.6)	
<i>Osteopathic</i>	3 (15.8)	0	1 (10)	1 (12.5)	5 (11.1)	
<i>Allopathic</i>	0	0	1 (10)	1 (12.5)	2 (4.4)	
Dietetics	5 (26.3)	0	0	0	5 (11.1)	
Physician Assistant	3 (15.8)	0	0	1 (12.5)	4 (8.9)	
EMS/Paramedicine	2 (10.5)	1 (12.5)	0	0	3 (6.7)	
Other	0	1 (12.5)	1 (10)	1 (12.5)	3 (6.7)	
Behavioral/Mental Health	0	0	0	1 (12.5)	1 (2.2)	
Exercise Physiology	0	1 (12.5)	0	0	1 (2.2)	
Physical Therapy	0	0	0	1 (12.5)	1 (2.2)	
Missing	3	0	0	0	3	
<b>Extent of IPE facilitation – n (%)</b>						0.627
No activities	8 (42.1)	2 (25)	5 (50)	5 (62.5)	20 (44.4)	
1-5 activities	7 (36.8)	4 (50)	5 (50)	2 (25)	18 (40)	
6-10 activities	1 (5.3)	2 (25)	0	0	3 (6.7)	
11-15 activities	2 (10.5)	0	0	0	2 (4.4)	
15+ activities	1 (5.3)	0	0	1 (12.5)	2 (4.4)	
Missing	3	0	0	0	3	

**Table 1. Baseline Characteristics**

Note: Percentages are expressed per non-missing values.

P-values from Fisher's exact tests.

Survey Items	Overall Total (n=44)			
	Pre-program Mean (SD)	Post-program Mean (SD)	Change (95% CI)	P-value
<b>Factor 1: Knowledge</b>				
1. I can describe what IPE is in 1-2 sentences.	3.75 (1.53)	5.45 (0.63)	1.70 (1.27-2.13)	<0.001
2. I can accurately explain the duties and skill sets of other professionals.	3.70 (1.01)	4.63 (1.00)	0.91 (0.53-1.29)	<0.001
<b>Factor 2: Value</b>				
3. I am aware of the responsibilities of other health care professionals and believe they add value to my decision-making in patient care.	4.66 (0.89)	5.20 (0.82)	0.55 (0.22-0.87)	0.002
4. I believe IPE is important and should be an integral part of health professional students' education and training.	5.30 (0.98)	5.77 (0.42)	0.48 (0.19-0.76)	0.002
5. I feel that working with care providers of professions other than my own can improve outcomes.	5.65 (0.61)	5.81 (0.45)	0.16 (-0.03-0.35)	0.090
6. Other professionals understand my role in health care and all that I can offer.	3.26 (1.03)	4.35 (1.19)	1.07 (0.67-1.47)	<0.001
7. The reach of my professional knowledge and skills are limited and are complemented by the expertise of other professionals.	4.59 (1.04)	5.50 (1.04)	0.91 (0.59-1.22)	<0.001
<b>Factor 3: Application</b>				
8. I am equipped with tools for facilitating IPE in my class if I choose to do so.	3.21 (1.37)	5.07 (1.37)	1.77 (1.32-2.23)	<0.001

**Table 2.** Overall Mean (SD) Response Outcomes – Per-protocol Population

Note: No significant cohort differences were observed; aggregated outcomes are presented. P-values from paired samples Student's *t* tests.

The greatest change was observed with Factor 3 item 8 “I am equipped with tools for facilitating IPE in my class if I choose to do so” (mean change of 1.77; 95% CI, 1.32-2.23;  $p < 0.001$ ) and with Factor 1 item 1 “I can describe what IPE is in 1-2 sentences” (1.70; 95% CI, 1.27-2.13;  $p < 0.001$ ). More moderate changes were observed with Factor 1 item 2 “I can accurately explain the duties and skill sets of other professionals” (0.91; 95% CI, 0.53-1.29;  $p < 0.001$ ) and with Factor 2 item 6 “Other professionals understand my role in health care and all that I can offer” (1.07; 95% CI, 0.67-1.47;  $p < 0.001$ ) and item 7 “The reach of my professional knowledge and skills are limited and are complemented by the expertise of other professionals” (0.91; 95% CI, 0.59-1.22;  $p < 0.001$ ). The least change was observed with Factor 1 item 3 “I am aware of the responsibilities of other health care professionals and believe they add value to my decision-making in patient care” (0.55; 95% CI, 0.22-0.87;  $p = 0.002$ ) and item 4 “I believe IPE is important and should be an integral part of health professional students' education and training” (0.48; 95% CI, 0.19-0.76;  $p = 0.002$ ).

### Themes

Four themes emerged from the exploratory analysis of participants' comments: Tools, Knowledge, Value, and Bias (Table 3). Several examples of each are described below.

**Tools.** Several participants felt the SWIPE Program equipped them with new tools to advance interprofessional education and/or collaboration in their respective institutions.

[I learned about] many different tools to work with other professionals to enhance practice and ultimately patient care.

[I learned] some fantastic ideas on how to get various health professions to work [together] and respect each other.

[I] gained some skill in facilitating productive communication between student[s] and also between fellow staff members.

[I learned] there are many tools we can use to create collaboration.

Survey Items	Themes			
	Tools	Knowledge	Value	Bias
1. What is one thing you learned about IPE from attending this program? (n=41)*	22	6	7	7
2. Comment on any changes you noticed in your understanding of IPE from before and after attending this program. (n=27)**	5	13	10	1
Total Number of Comments by Theme	27	19	17	8

**Table 3.** *Qualitative Response Outcomes by Theme*

\*One response comment contained 2 themes.

\*\*Two response comments each contained 2 themes.

**Knowledge.** Participants noted that their understanding of IPE and of the roles and responsibilities of other professionals were enhanced through the SWIPE Program. Some comments were evidently written by those without any experience with IPE prior to attending the SWIPE Program (44.4%).

I was not familiar with the term IPE prior to this workshop. Now I understand the concept.

I really didn't know anything about it before tonight.

The impact on knowledge concepts was also observed in those 55.6% of participants with prior IPE experience.

[SWIPE] reinforced my understanding of IPE and appreciation of using it to improve patient outcomes.

My foundation for IPE knowledge has changed through this education. I lacked key knowledge components that might have been helpful for me.

[I learned] how different but connected each other[s'] roles truly are.

[I learned about] the various roles of other health professionals.

**Value.** The value of collaborating with other professionals and educating the next generation of health care professionals was described by many participants.

Better appreciation of how other health care profession[als] interact with each other and that collaboration is essential.

There are many fields that want to participate.

Other professionals do respect the input of other professionals.

[I learned of] the importance of employing varied methods of engaging students in discussion and contemplation of IPE in practice and education at early (and ongoing) stages of their careers.

**Bias.** One of the program's activities focused on implicit bias, and the level of its impact was revealed in the participants' comments.

[I learned] implicit bias is integrated into our brains – regardless of profession.

I learned that I have biases without realizing it.

[I learned about] the importance of not making assumptions.

[I] need to be more and more aware of implicit bias.

## Discussion

The primary objective of this study was to describe perceived changes in knowledge and/or value of interprofessional practice and education in health professions faculty and preceptors after attending the SWIPE Faculty Development Program. The results of this study show that the SWIPE Program was effective in increasing participants' perceived change in knowledge and value of IPE.

As shown in Table 1, improvements in scores from baseline to post-program were demonstrated for all items except one. The most significant improvements were demonstrated in participants' perceived ability to describe what learning activities constitute IPE and

knowledge of tools that can be used for IPE facilitation in the classroom or practice site (Factor 1 item 1 and Factor 3 item 8). Although not the primary objective, these findings are not surprising given the program provided clear definitions of IPE and IPCP, which were then emphasized through description and practice of several different IPE facilitation tools.

Moderate improvements were seen in scores related to participants' perceived ability to describe the duties and skills of other health professions (Factor 1 item 2), in understanding their role and the roles of others in health care delivery (Factor 2 item 6), and the ability of interprofessional practice to complement their own expertise (Factor 2 item 7). Although specific didactic content on the roles and responsibilities of different health professions was not included in the program materials, participants were encouraged to explore these concepts through the interactive and hands-on practice of the facilitation tools and activities delivered through the program.

Limited changes were seen related to participants' awareness of the responsibilities and value of other health professions (Factor 2 item 3) and belief that IPE is an important and integral part of students' education and training (Factor 2 item 4). Lastly, no changes were seen in participants' belief that IPCP can improve outcomes (Factor 2 item 5). These findings are not concerning since the participants' baseline scores related to value of other professions, belief that IPE is important, and belief that IPCP improves outcomes were already at a high level.

Four themes emerged from analysis of the comments provided by SWIPE Program participants. These themes, including Tools, Knowledge, Value, and Bias, are consistent with the survey results. In general, the comments were positive and related to increased understanding and appreciation for the tools for IPE facilitation, perceived increased knowledge of IPE and the roles and responsibilities of other professions, increased appreciation for the value of IPCP, and recognition of how implicit bias may impact their ability to teach and practice interprofessionally. Through provision of foundational information on definition and purpose of IPE, opportunity to explore roles and responsibilities of other healthcare providers, and experience with application of IPE facilitation tools, it is anticipated that participants of the SWIPE faculty de-

velopment program will carry a positive outlook back to their home institutions. This improved perspective may continue to impact and extend interprofessional culture in their classrooms and clinics and encourage further development of behaviors and skills that support collaborative practice and ultimately improved patient care.

### *Strengths*

Strengths of this study include the consistency of data and the absence of outliers across multiple cohorts with varied numbers and types of participants. An additional strength is the inclusion of representatives from a wide range of health professions, including medicine, nursing, pharmacy, dietetics, paramedicine, and others.

### *Limitations*

This study is not without limitations that may influence the interpretation of these findings, including a small sample size ( $n=44$ ) and lack of use of a validated assessment tool. Because of the smaller sample size, subgroup analyses [such as by age, gender, profession, time in practice, site (academic vs. clinical, acute vs. ambulatory), or time teaching IPE] were not performed. A surrogate measure of time teaching IPE was assessed by the number of IPE activities previously facilitated. Most participants were relatively new to IPE, having facilitated five or fewer activities. In other words, the amount of previous IPE experience did not indicate a statistically significant difference in knowledge pre- and post-program. Use of a non-validated survey tool is a study limitation that may affect the generalizability and reproducibility of the results. The primary objective of this study corresponds to levels 2 in the Kirkpatrick model of assessment (Kirkpatrick, 1994). Level 2 in this model addresses changes in attitudes and perceptions as well as the acquisition of knowledge and skills. Shrader and colleagues (2017) conducted a thorough review of available and validated IPE assessment tools and did not identify one single tool designed to measure both changes in attitudes and perceptions and gain in knowledge. Because the investigators were unable to identify a previously validated tool that would effectively answer the study question, a new survey instrument was created. It is hoped that the validity of this instrument will be further explored in subsequent studies. Finally, a selection bias or participation bias may have influenced the results of this study. It is pos-

sible that participants in the SWIPE program were biased towards positive survey responses because they already actively contribute to the YVIPEC core IPE curriculum as faculty and facilitators. More than 50% of participants had prior experiences in facilitating interprofessional learning events but survey results and comments indicate that significant numbers were also very new to IPE, which minimizes the effect of this bias. It is the goal of the SWIPE team to provide training to all faculty that participate in the IPE curriculum and these survey results support the value of offering the training on a larger scale.

## Conclusion

In conclusion, the SWIPE program met its primary objective, which was to improve the perceived knowledge and value of IPE of faculty and preceptor program participants. An unexpected secondary outcome of participant appreciation for experience with and practical application of IPE facilitation tools was also observed. Because of these findings, the development of a second SWIPE Program course is underway – one focused on building interprofessional skills and behaviors which may empower participants to incorporate IPE and IPCP at their respective institutions. This new program will also be designed as a hands-on, learn-through-experience course, in a train-the-trainer format similar to this present SWIPE Program course. An evaluation of this course is planned with a goal of measuring the degree of implementation of knowledge, skills, and IPE facilitation tools in participants' teaching and practice environments as a result of the training.

Having faculty and preceptors who are familiar with and respectful of the roles and responsibilities of other health professions is a foundational component of an effective IPE curriculum (Loversidge & Demb, 2015). In order to effectively teach and model IPCP, it is important to ensure that IPE faculty and preceptors have a strong appreciation for and basic knowledge of these roles and responsibilities.

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## References

- Bodenheimer, T. & Sinsky, C. (2014). From triple to quadruple aim: care of the patient requires care of the provider. *Annals of Family Medicine*, 12(6), 573-576. <https://doi.org/10.1370/afm.1713>
- Institute of Medicine. (1972). *Educating for the health team*. Washington, DC: National Academy of Sciences. <https://files.eric.ed.gov/fulltext/ED110819.pdf>
- Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21<sup>st</sup> century*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/10027>
- Institute of Medicine. (2003). *Health professions education: A bridge to quality*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/10681>
- Kirkpatrick, D. L. (1994). *Evaluating training programs: the four levels*. San Francisco: Emeryville, CA: Berrett-Koehler; Publishers Group West [distributor]. <https://eric.ed.gov/?id=ED382790>
- Kohn, L., Corrigan, J., & Donaldson, M. (2000). *To Err is human: Building a safer health system*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/9728>
- Lawlis, T., Anson, J., & Greenfield, D. (2014). Barriers and enablers that influence sustainable interprofessional education: a literature review. *Journal of Interprofessional Care*, 28(4), 305-310. <https://doi.org/10.3109/13561820.2014.895977>
- Liberating Structures. (n.d.) *Including and Unleashing Everyone*. <https://www.liberatingstructures.com>.
- Loversidge, J. & Demb, A. (2015). Faculty perceptions of key factors in interprofessional education. *Journal of Interprofessional Care*, 29(4), 298-304. <https://doi.org/10.3109/13561820.2014.991912>
- Mladenovic, J. & Tilden, V. (2017). Strategies for overcoming barriers to IPE at a health sciences university. *Journal of Interprofessional Education and Practice*, 8, 10-13. <https://doi.org/10.1016/j.xjep.2017.05.002>

Shrader, S., Farland, M. Z., Danielson, J., Sicut, B., & Umland, E. M. (2017). A systematic review of assessment tools measuring interprofessional education outcomes relevant to pharmacy education. *American Journal of Pharmaceutical Education*, 81(6), 119. <https://doi.org/10.5688/ajpe816119>

Steinert, Y. (2005). Learning together to teach together: interprofessional education and faculty development. *Journal of Interprofessional Care*, 19(Suppl. 1), 60-75. <https://doi.org/10.1080/13561820500081778>

Summerside, N., Blakeney, E. A., Brashers, V., Dyer, C., Hall, L. W., Owen, J. A., Ottis, E., Odegard, P., Haizlip, J., Liner, D., Moore, A., & Zierler, B. K. (2018). Early outcomes from a national Train-the-Trainer interprofessional team development program. *Journal of Interprofessional Care*, 1-4. Advanced online publication. <https://doi.org/10.1080/13561820.2018.1538115>

World Health Organization. (2010). Framework for action on interprofessional education and collaborative practice. Geneva: World Health Organization. [https://www.who.int/hrh/resources/framework\\_action/en/](https://www.who.int/hrh/resources/framework_action/en/)

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