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# Dietetic Students' Changes in Attitudes after Participating in Online Interprofessional Education

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## ABSTRACT

Interprofessional education (IPE) is an accreditation requirement and an important component of training for future registered dietitian nutritionists (RDNs) and access to quality IPE is often limited in online programs. An online IPE module was developed to provide dietetics students the opportunity to build collaborative skills with students in other healthcare training programs. A research study was designed to answer the following research question: How and to what extent does participation in an online IPE module impact online dietetics students' attitudes of interprofessional practice? Participants were dietetics students enrolled in an upper-division online dietetics course. Data gathered included a retrospective pre-post survey, reflection journal entries, and focus group interviews. Results suggested that the online IPE intervention had a positive impact on dietetics students' attitudes of interprofessional practice and enhanced their understanding of the roles of members of the interprofessional team. The opportunity for participants to work on a final project as part of an interprofessional team likely contributed to the positive shared learning experiences and overall growth in interprofessional collaboration.

## KEYWORDS

dietetics, online learning, interprofessional education, interprofessional attitudes

## INTRODUCTION

In traditional university-level healthcare training programs, including dietetics programs, learning primarily occurs in the context of students' own profession, which is termed uniprofessional learning.<sup>1</sup> Students develop their professional worldview primarily through the lens of their specific discipline. This limited worldview can potentially lead to siloed thinking and a decreased inclination to

engage in collaborative practice with other healthcare professionals.<sup>2</sup> The complement to uniprofessional learning is interprofessional education (IPE), where "students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes."<sup>3(p 13)</sup>

IPE is identified as the bridge between the education system and the healthcare system to achieve better patient care and health outcomes, and create more efficient and

affordable education and healthcare systems.<sup>4</sup> IPE also provides a viable and critical means by which the healthcare system can address growing complexities and create new models of patient care.<sup>3-5</sup> The potential beneficial impacts of incorporating IPE into health professions curricula are wide-ranging and include: increased collaboration skills,<sup>6,7</sup> decreased professional stereotyping,<sup>1,8-13</sup> and improved communication.<sup>14</sup> One of the most cited benefits of IPE is that it promotes students' collaborative mindset.<sup>7,11,14,15</sup> Another benefit of IPE is that, by exposing students to roles and responsibilities of different health professionals, students are less likely to engage in professional stereotyping and generally have more positive perceptions of other health professions, both of which promote collaborative readiness.<sup>8,10,14</sup> Ateah et al<sup>8</sup> found that a structured interprofessional experience promoted significant changes in students' negative thinking of other healthcare professions. Similarly, in a prospective controlled trial of an IPE intervention by Darlow et al,<sup>10</sup> student attitudes toward interprofessional teams showed a positive increase after completion of the training.

Although there are many documented benefits of IPE,<sup>6-8</sup> delivering quality IPE has several challenges. Logistical issues such as coordinating face-to-face IPE curricula across healthcare training programs, scheduling interactions between students who may be geographically separated, and overcoming discipline-specific differences in IPE needs have been reported.<sup>16-18</sup> Delivering IPE in an online environment, however, has been suggested to mitigate many of the logistical challenges traditional face-to-face IPE encounters. Miers et al<sup>19</sup> found that an online interprofessional module was successful in connecting students in different healthcare training programs located across multiple campuses who might otherwise not come into contact with each other. Online modalities of IPE have also been reported to provide students flexibility to fit IPE curriculum into their busy schedules,<sup>7,20,21</sup> as well as allow time

for reflection on interprofessional practice.<sup>22</sup> Online delivery of IPE may also encourage more inclusive and meaningful contributions by students.<sup>23</sup> Several studies also demonstrated that online delivery of IPE was able to significantly increase students' understanding and perceptions of IPE and interprofessional practice.<sup>7,14,20,22,24</sup> The Health Professions Accreditors Collaborative (HPAC)<sup>5</sup> supports the use of online and virtual modalities as part of quality IPE curriculum and outlines four expectations of quality IPE as: (1) having a stated rationale, (2) establishing outcome-based goals, (3) including deliberate design, and (4) performing assessment and evaluation.

The problem of practice that initiated this research study was that online dietetics students lacked access to formal IPE opportunities. IPE is a dietetics accreditation requirement<sup>25</sup> and includes critical knowledge for students' future practice, which indicates added urgency to tackling this lack of access. To address the problem of practice, an online IPE intervention was designed and developed to incorporate opportunities for students from different healthcare disciplines to virtually learn about, from, and with each other.

The purpose of this research study was to explore the feasibility of delivering IPE to students in an online dietetics course. A tailored online IPE intervention was developed and delivered to dietetics students completing upper-division program requirements. The following research question was explored: How and to what extent does participation in an online IPE module impact online dietetics students' attitudes of interprofessional practice?

## **METHODOLOGY**

A mixed methods research approach<sup>26</sup> was used to investigate the impact of an online IPE intervention on dietetics students' attitudes concerning interprofessional practice. A mixed methods approach facilitates discovery of a more nuanced and enhanced perspective of the problem, utilizing qualitative and quantitative

data in a complementary and integrated way.<sup>26,27</sup> Collecting and interpreting both types of data together provided a richer understanding of the intervention's impact<sup>28</sup> and best aligned with the research question. Triangulation was achieved whereby quantitative and qualitative data were collected concurrently in order to enhance interpretation of the results.<sup>26,28</sup>

Data sources were chosen based on their utility to answer the research question, the evidence of their appropriateness for this study based on published literature, and for their feasibility given the intervention approach and time constraints of the study. The research was conducted at the University of Arizona within an accredited dietetics program.

## METHODS

The intervention utilized an online IPE module delivered over a three-week period. Approval for the study was obtained from the Institutional Review Boards (IRB) of the University of Arizona and Arizona State University (#STUDY00012962).

Students enrolled in an online medical nutrition therapy (MNT) course were recruited to complete the study. These students represented a relatively small pool of potential participants necessitating the use of non-probability sampling or purposive recruitment.<sup>29</sup> A total of 11 undergraduate dietetics students consented to participate in the study by completing an online *Qualtrics*<sup>TM30</sup> consent form. All participants were female and seniors in the dietetics program. Additional demographic data were not gathered to help maintain confidentiality due to the small sample size. Students from other healthcare training programs (e.g., public health, nursing, medicine, and pharmacy) completed the online IPE module, but data were only collected from consented dietetics students to maintain a defined focus for the study. To promote interprofessional learning, dietetics participants and students from other healthcare training programs were placed into diverse interprofessional teams of four or five

members for the duration of the module. A diverse team was defined as having students from at least three different healthcare training programs.

Participants completed a three-week intervention that focused on the roles and responsibilities of healthcare providers, as well as interprofessional practice and collaboration. Both the Interprofessional Education Collaborative<sup>31</sup> competencies and HPAC<sup>5</sup> guidance were used as a foundation for creating the intervention. Students were engaged in a collaborative project around the focal area of weight management in the context of a weight-inclusive model,<sup>32</sup> which is a current issue facing the healthcare system and relevant to all healthcare providers. Additional module activities included readings, videos, reflective journal entries, as well as structured and unstructured team interactions. All module activities and data collection instruments were provided through a learning management system, *Desire2Learn*<sup>TM</sup> (D2L),<sup>33</sup> designed specifically for the online IPE module.

## Quantitative Data Collection

The quantitative data source used was the Interprofessional Attitude Scale (IPAS),<sup>34</sup> a validated instrument used to assess students' attitudes of IPE and interprofessional collaborative practice.<sup>31,34</sup> The IPAS was validated using factor analysis (Cronbach alpha coefficients of 0.62 to 0.92) which produced a 27-item scale with five sub-constructs: (1) teamwork, roles and responsibilities, (2) patient-centeredness, (3) interprofessional biases, (4) diversity and ethics, and (5) community-centeredness.<sup>34</sup> Participants were asked to respond to statements using a five-point Likert scale where 1 was *strongly disagree*, 2 was *disagree*, 3 was *neutral*, 4 was *agree* and 5 was *strongly agree*. The instrument was provided to participants using *Qualtrics*<sup>TM30</sup> survey software. To address the possibility of response-shift bias, participants were given the retrospective pre-post survey *after* they completed the intervention. Changes in attitudes of interprofessional practice were measured by first asking participants to assess

their attitudes before the intervention and then, in the same survey, assess their attitudes after the intervention.<sup>35-36</sup> This allowed participants to respond to statements using the same frame of reference.

### Qualitative Data Collection

Two qualitative data sources were used – reflective journal entries and focus group interviews. Three reflective journal entries were completed throughout the module, and focus group interviews conducted after participants completed the intervention. Prompts were provided for the reflective journal entries to help elicit responses about participants' experience with IPE and interprofessional practice, as well as their interprofessional attitudes. Journal entries were completed through the D2L Discussions tool but were not open for peer review and comments. Semi-structured focus group interviews were conducted after participants completed all IPE module activities and the IPAS retrospective pre-post survey. All 11 participants were invited via email to participate in focus group interviews conducted on Zoom, and a total of six agreed to participate. Two focus group interviews were conducted by the lead author, three participants per group. Each group was asked the same questions and time was provided for all participants to respond and have a voice.<sup>28</sup>

### Data Analysis

Analyses of the IPAS data were completed using *SPSS 25*®.<sup>37</sup> To explore the internal consistency of the survey, Cronbach's alpha

**Table. Descriptive Statistics for IPAS Retrospective Pre- and Post-survey Sub-constructs**

	Retrospective			
	Pre-survey Score		Post-survey Score	
<i>n</i> = 11				
Sub-construct	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1 - Teamwork, Roles, & Responsibilities	3.93	.645	4.38	.527
2 - Patient-Centeredness	4.58	.623	4.76	.418
3 - Interprofessional Biases	3.24	.818	3.21	.749
4 - Diversity & Ethics	4.50	.622	4.80	.350
5 - Community-Centeredness	4.14	.586	4.53	.306

was calculated.<sup>38</sup> To evaluate changes in the mean scores for each sub-construct in the retrospective pre- and post-survey, descriptive statistics were completed.

For all qualitative data analyses, the computer assisted analysis software program, *HyperRESEARCH*<sup>™39</sup>, was used to organize and code the data. Both qualitative data sources were evaluated separately using an inductive and iterative approach.<sup>40</sup> The data were first organized by data source into Word documents and read several times to gain a general understanding of the data. The data were then uploaded to *HyperRESEARCH*<sup>™39</sup> for formal coding. Formal coding was conducted at the line level using open coding.<sup>41</sup> Codes were then organized into themes using several different approaches. The first approach utilized a diagramming feature of *HyperRESEARCH*<sup>™39</sup> called code mapping in which relationships between codes can be visually displayed. Other techniques were used as suggested by Saldaña<sup>41</sup> including identifying a "trinity" of major themes and creating a "top 10" list of quotes from each data source to identify the most significant ideas. Initial coding and theme development was done by the lead author and reviewed by the co-authors. Use of *HyperRESEARCH*<sup>™39</sup> helped to maintain an audit trail of the qualitative data analysis by

tracking all codes, code descriptions, and theme development.

## RESULTS

### Quantitative Results

The internal reliability results for four of the five survey sub-constructs and for the primary construct, indicate that the coefficient alpha estimate of reliability was equal to or greater than 0.65, which indicates acceptable reliability.<sup>42,43</sup> For example, the alpha for the *Teamwork, Roles and Responsibilities* (items 1.1 to 1.9) sub-construct was greater than 0.80 for both the pre- and post-survey, indicating a low amount of error variance. The alpha for the sub-construct *Community-centeredness* was 0.422 (post-survey only), suggesting possible unacceptable variance error.

The retrospective pre- and post-survey means and standard deviations for the IPAS sub-constructs are shown in the Table. In general, the mean scores showed a trend toward more agreement from the pre- to post-survey responses. *Teamwork, Roles, and Responsibilities, Diversity and Ethics, and Community-centeredness* all showed increases after the intervention. There was little change in *Patient-centeredness*, and *Interprofessional Biases* showed a decrease.

Item analysis by sub-construct was conducted. For the first sub-construct, *Teamwork, Roles, and Responsibilities*, responses to eight of the nine items show a trend toward more agreement, with higher mean scores on the post-survey as compared to the pre-survey. Item 1.8 was worded in reverse of the other eight items; the item stated that shared learning for health professions students is not necessary. For this item, the post-survey mean score was lower than the pre-survey mean score, indicating the participants had a higher level of disagreement with the statement after completing the intervention. For the sub-construct, *Community-centeredness*, levels of agreement increased from the pre- and post-survey mean scores for all items. The greatest change in mean score was for item 5.4 related to the

importance of health professionals working with non-clinicians, where the pre-survey mean score was 3.55 ( $SD = .688$ ) and the post-survey mean score was 4.18 ( $SD = .751$ ).

### Qualitative Results

#### *Reflective Journal Entries*

Three overarching themes were identified from the reflective journal entry text data that related to participant attitudes regarding interprofessional practice – *foundations of interprofessional teams, interprofessional learning, and benefits of interprofessional practice*.

#### **Foundations of Interprofessional Teams.**

Several participants discussed the characteristics of a successful interprofessional team. The described characteristics provided insight into how their attitudes about interprofessional teams may have evolved throughout the IPE intervention. One participant wrote, “My teammates have also taught me that their roles are just as important as mine and we all deserve the same amount of respect.” Some participants described the development of trust and respect as a consequence of learning about and internalizing the roles of other team members as exemplified by this participant’s comment:

If all potential members of a treatment team have a deepened understanding of each member's unique role on that team, the team functions more efficiently and effectively. This benefits the patient and each professional because it establishes a circle of trust.

Understanding team members’ motivations was also articulated by one participant as foundational for interprofessional teams to provide coordinated care.

**Interprofessional Learning.** Engaged learning in the IPE intervention impacted participant attitudes related to interprofessional practice. Some participants discussed the ways in which interprofessional

practice can lead to better patient outcomes. One participant reflected:

I learned the importance of working with other disciplines to achieve a well-rounded approach to patient care. If each of us accepts the responsibility to provide input to patient care in our area of expertise and also to help educate other team members in the aspects of our role, the benefit will always be to the patient.

Another participant noted that through the experience of the IPE intervention, their attitude changed with regard to asking questions of other healthcare providers and engaging in a dialogue about best approaches to patient care:

I have also learned that it is ok to ask another professional a question about the patients [sic] care and that we should have an open line of communication with each other to allow for questions and comments to be voiced without feeling hesitant.

In interprofessional teams where a student from the public health discipline was a member, participants often made specific mention of the learning that occurred and the new insights gained regarding the importance of this discipline. For example, one participant noted:

I had two public health majors on my team and I gained a deeper appreciation for their role in overall health as often they have the first opportunity to provide education and insight to the public regarding better health and health outcomes.

#### **Benefits of Interprofessional Practice.**

Another way in which participant attitudes were impacted related to the benefits they attributed to interprofessional practice, such as more well-rounded patient care, decreased

medical errors, and more cost-efficient care. For example, one participant wrote, "Without proper training in interprofessional roles, more medical errors occur because the patient isn't being treated as a whole, and the left hand may not know what the right hand is doing." Also discussed was the synergist effect of teamwork where the collective is more effective than the sum of its parts, "The collaboration of interprofessional education allows professionals to work together to achieve the same goals. This allows them to achieve together more than they can achieve individually."

#### **Focus Group Interviews**

Six participants participated in focus group interviews. When analyzing the focus group interviews for content related to changes in participant interprofessional attitudes, four major themes were identified – *shared learning*, *shifts in perspective*, *broadened knowledge-base*, and *insights into future practice*. Each theme represents the ways in which participants attitudes were impacted after completing the IPE intervention.

**Shared Learning.** The theme of *shared learning* represents participants' description of learning that occurred because of collective knowledge-making. Participants described aspects of their team's interactions and how those facilitated new insights. One participant shared, "It was cool to learn about everyone's different profession and how we all have the same goal and can give feedback and learn from each other." Through shared learning experiences there were also opportunities to break down barriers of communication and appreciate each individual's unique perspectives. For example, one participant noted, "[We were] respectful of each other and each other's opinions. They also weren't afraid to ask questions to me and what I do, and questions to them and what they do."

**Shifts in Perspectives.** Participants articulated changes in interprofessional attitudes as they grappled with pre-conceived

notions of other healthcare disciplines and challenged biases they might have held. One concept that was mentioned often was empathy, such as in this participant's comment,

I felt that I was able to be a bit more empathetic towards the other professions because we were able to, like, we see through their lenses and you know, become more open minded towards these other professions.

The same participant recognized a bias she held against the public health discipline prior to completing the IPE intervention:

One bias I had towards the public health would be that they just ... um ... like their education is very broad, and so they may not know like as much or any ... subject as well as they should. But seeing what they do know and interacting and communicating with them, then you're able to take away that bias and be like okay, so this is what [a] public health person actually does. And so you're able to like empathize more with the role.

This is another example of the impact public health students had on participants, specifically related to promoting changes in interprofessional attitudes.

**Broadened Knowledge Base.** Several participants noted the knowledge gained after participating in the IPE intervention. For some participants, the concept of an interprofessional team was new and changed the way they envisioned the healthcare system in general. One participant stated,

I honestly haven't had too much background, like in volunteering or working in like healthcare settings so having this ... um ... kind of really opened my eyes."

Related again to the discipline of public health, one participant discussed her

realization that dietetics and public health are natural partners,

It gave me a broader understanding of what somebody who works in public community health, and, the overlap with dietetics and how much I don't know. It became apparent to me that those two should go together.

Attitudes about interprofessional practice were impacted when participants could see the direct application of what they learned in the IPE intervention to real-world practice. One participant noted:

When we were creating the resource material, we all decided on like a topic, and what we wanted to do and, um, our roles and so when we went to put in our comments and fill it in, I could see what they were missing in the resource, and so I was able to put like the necessary information that dietitians would be able to put. And so, seeing that like actually happen and be like okay 'hey you're missing this information' ... I'm sure that's what happens in the real world too, in hospitals and clinics.

A similar sentiment was echoed in this participant comment, "I think this can really help kind of facilitate when we are out there in the real world thinking about going to that next professional and asking them, you know, what they think about patient care."

## DISCUSSION

Evidence from this mixed methods study suggested that the three-week, online IPE promoted positive changes in dietetic students' attitudes of interprofessional practice. There were three main findings of the study. First, the intervention heightened participants' awareness of the importance of shared learning and understanding their own limitations and knowledge gaps. Second, after the intervention participants were able to identify several characteristics of successful



interprofessional teams. Third, exposure to students in public health programs positively influenced participants' appreciation for the public health perspective and the need to work with non-clinicians.

Results from the retrospective pre-post IPAS suggested that the intervention had a positive impact on participants' attitudes in the specific areas such as teamwork and community-centeredness. After completion of the intervention, there was an increased level of agreement by participants regarding the ability of shared learning to assist them in becoming a more effective team member and understanding their own limitations. These findings were reinforced by the qualitative results from the reflective journal entries and focus group interviews where participants articulated that working with their interprofessional team allowed them to see beyond the nutrition perspective. Shared learning opportunities provided throughout the intervention likely contributed to this outcome, as participants noted that knowledge gaps were exposed. Boyle et al<sup>24</sup> reported similar findings regarding the importance of shared learning in IPE to improve teamwork and communication skills.

In the reflective journal entries and focus group interviews, participants suggested essential characteristics of successful teams, including open-mindedness, respect, and trust. Singh and Matthees<sup>21</sup> reported similar findings after participants completed an online IPE intervention; participants articulated the importance of IPE in developing trust and improved communication between team members. Similarly, Jones et al<sup>17</sup> found that participants who completed an online IPE intervention were more empathetic towards other healthcare disciplines. In the current study, an increase in empathy was noted by several participants after the intervention and was related to the development of respect and trust of other healthcare disciplines.

Several studies reported similar findings regarding health students' positive attitudes toward interprofessional education and

practice.<sup>7,10,17,22,24,44,45</sup> The length of the interventions in these studies were wide-ranging, with one intervention lasting approximately six hours<sup>42</sup> indicating that even relatively brief exposure to IPE can be effective. In some studies, online interventions included little to no student interaction.<sup>22,24</sup> While it is encouraging that a variety of IPE approaches can produce positive outcomes, to meet the spirit of the World Health Organization's<sup>3</sup> definition of IPE, students of different disciplines should engage directly with each other. A strength of the current study was the promotion of shared learning through formal and informal student interactions as well as a focused team project.

IPAS results related to community-centeredness with regard to working on public health projects and working with non-clinicians as part of interprofessional practice suggested that participants were positively influenced by interactions with their public health team members. Qualitative results were similar. For example, several participants mentioned gaining a deeper respect for the public health discipline and discussed the important contributions these professionals made as part of the interprofessional team. These findings highlight the need for public health students to be included in IPE activities and share relevant professional perspectives in areas such as chronic disease prevention and social determinants of health. Better integration of public health students into IPE activities has been recognized as a priority for public health programs.<sup>46,47</sup>

There were several limitations of the study which could have influenced the impact of the intervention and overall results. The first limitation was the disproportionate number of public health students who completed the module, which impacted the creation of diverse interprofessional teams. This results in fewer diverse interprofessional teams, limiting the total number of dietetic participants whose data were used in the final analyses. A second limitation was the small sample size, particularly for quantitative data analysis,

which may have reduced the ability to detect the true effect of the intervention and limits the generalizability of the results. This was further impacted by the fact that participants were part of a convenience sample. A third limitation was the short duration of the intervention. The HPAC<sup>5</sup> recommends that IPE curriculum be delivered throughout students' several years of training, which was not feasible due to the structure of the intervention. However, there is evidence that shorter IPE interventions of two weeks or less can still produce positive outcomes.<sup>10,24,45</sup> Even so, the implication of a shorter intervention was that it may have been more difficult to see large changes within the given timeframe.

### IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE

Future studies should be conducted that utilize a larger sample size to enhance understanding of the potential for an online IPE to impact participant attitudes. It may also be beneficial to compare online and in-person IPE modes of delivery. Another potential area of inquiry is investigating whether changes in interprofessional attitudes are maintained over time and have an impact on participants' future practice. There are few published reports of longitudinal studies of IPE,<sup>13,48</sup> perhaps because of the logistical challenges involved with tracking students over long periods of time and controlling for different worksite-related factors.

Based on the study findings, dietetics students may benefit from incorporation of IPE throughout their training, as suggested by HPAC.<sup>5</sup> For all participants this was the only exposure to interprofessional practice. Relying on a single, three-week IPE experience is likely inadequate preparation for students who will need critical interprofessional skills to navigate a complex healthcare system.<sup>3-5</sup> In addition, dietetics programs should consider increasing interactions between dietetics and public health students. Most participants acknowledged little understanding of the public health discipline prior to the study, but

after working together, they found their public health team members to have specific knowledge and skills that were indispensable to the team.

### CONCLUSION

IPE is a dietetics requirement<sup>25</sup> and therefore needs to be accessible for students in accredited programs. The current study confirms that an online IPE curriculum can facilitate changes in dietetics students' interprofessional attitudes related to their role as part of the interprofessional teams and community-centered practice. Results also suggest an opportunity for more shared learning between dietetics and public health students.

### DISCLOSURE STATEMENT

The authors report there are no competing interests to declare.

### REFERENCES

1. Oandasan I, Reeves S. Key elements for interprofessional education. Part 1: The learner, the educator and the learning context. *J Interprof Care*. 2005;19(sup1):21-38. doi:10.1080/13561820500083550
2. Eliot KA, Kolasa KM. The Value in Interprofessional, Collaborative-Ready Nutrition and Dietetics Practitioners. *J Acad Nutr Diet*. 2015;115(10):1578-1588. doi:10.1016/j.jand.2015.03.025
3. World Health Organization. Framework for Action on Interprofessional Education and Collaborative Practice. Published online 2010.
4. *Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models Across the Continuum of Education to Practice: Workshop Summary*. National Academies Press; 2013:13486. doi:10.17226/13486
5. Health Professions Accreditors Collaborative. Guidance on developing quality interprofessional education for the health professions. Published online 2019.
6. Bridges DR, Davidson RA, Soule Odegard P, Maki IV, Tomkowiak J. Interprofessional collaboration: three best practice models of interprofessional education. *Medical Education Online*. 2011;16(1):6035. doi:10.3402/meo.v16i0.6035
7. Evans S, Ward C, Margerison C. Online interprofessional education in dietetic students: Online interprofessional education. *Nutr Diet*.

- 2016;73(3):268-274. doi:10.1111/1747-0080.12235
8. Ateah CA, Snow W, Wener P, et al. Stereotyping as a barrier to collaboration: Does interprofessional education make a difference? *Nurse Educ Today*. 2011;31(2):208-213. doi:10.1016/j.nedt.2010.06.004
  9. Cooper H, Spencer-Dawe E, McLean E. Beginning the process of teamwork: Design, implementation and evaluation of an inter-professional education intervention for first year undergraduate students. *J Interprof Care*. 2005;19(5):492-508.
  10. Darlow B, Coleman K, McKinlay E, et al. The positive impact of interprofessional education: a controlled trial to evaluate a programme for health professional students. *BMC Med Educ*. 2015;15(1):98. doi:10.1186/s12909-015-0385-3
  11. Eliot KA, Breitbach AP, Toomey E, Hinyard L. The Effectiveness of an Introductory Interprofessional Course in Building Readiness for Collaboration in the Health Professions. *Health and Interprofessional Practice*. 2018;3(3):eP1141. doi:10.7710/2159-1253.1141
  12. Hall P. Interprofessional teamwork: Professional cultures as barriers. *J Interprof Care*. 2005;19(sup1):188-196. doi:10.1080/13561820500081745
  13. Pollard KC, Miers ME, Gilchrist M. Collaborative learning for collaborative working? Initial findings from a longitudinal study of health and social care students. *Health Soc Care Community*. 2004;12(4):346-358. doi:10.1111/j.1365-2524.2004.00504.x
  14. Eccott L, Greig A, Hall W, Lee M, Newton C, Wood V. Evaluating students' perceptions of an interprofessional problem-based pilot learning project. *J Allied Health*. 2012;41(4):185-189.
  15. Ruebling I, Pole D, Breitbach AP, et al. A comparison of student attitudes and perceptions before and after an introductory interprofessional education experience. *J Interprof Care*. 2014;28(1):23-27. doi:10.3109/13561820.2013.829421
  16. Dow A, Blue A, Konrad SC, Earnest M, Reeves S. The moving target: outcomes of interprofessional education. *J Interprof Care*. 2013;27(5):353-355. doi:10.3109/13561820.2013.806449
  17. Jones TA, Vidal G, Taylor C. Interprofessional education during the COVID-19 pandemic: finding the good in a bad situation. *J Interprof Care*. 2020;34(5):633-646. doi:10.1080/13561820.2020.1801614
  18. Lawlis TR, Anson J, Greenfield D. Barriers and enablers that influence sustainable interprofessional education: a literature review. *J Interprof Care*. 2014;28(4):305-310. doi:10.3109/13561820.2014.895977
  19. Miers ME, Clarke BA, Pollard KC, Rickaby CE, Thomas J, Turtle A. Online interprofessional learning: The student experience. *J Interprof Care*. 2007;21(5):529-542. doi:10.1080/13561820701585296
  20. Kahlke R, King S, Carbonaro M, Boechler P, Drummond J, Greidanus E. Synchronous problem-based e-learning (ePBL) in interprofessional health science education. Published online 2010. doi:10.7939/R39872
  21. Singh J, Matthees B. Facilitating Interprofessional Education in an Online Environment during the COVID-19 Pandemic: A Mixed Method Study. *Healthcare*. 2021;9(5):567. doi:10.3390/healthcare9050567
  22. McKenna L, Boyle M, Palermo C, Molloy E, Williams B, Brown T. Promoting interprofessional understandings through online learning: A qualitative examination: Interprofessional and online learning. *Nurs Health Sci*. 2014;16(3):321-326. doi:10.1111/nhs.12105
  23. Khalili H. Online interprofessional education during and post the COVID-19 pandemic: a commentary. *J Interprof Care*. 2020;34(5):687-690. doi:10.1080/13561820.2020.1792424
  24. Boyle M, Williams B, Brown T, et al. Student attitudes toward a web-based interprofessional education package. *J Allied Health*. 2013;42(2):e33-36.
  25. ACEND Accreditation Standards Core Knowledge and Competencies. Published online n.d. Accessed July 25, 2022. <https://www.eatrightpro.org/acend/accreditation-standards-fees-and-policies/2022-standards>
  26. Ivankova NV. *Mixed Methods Applications in Action Research: From Methods to Community Action*. SAGE Publications; 2015.
  27. Tashakkori A & Creswell JW. Editorial: the new era of mixed methods. *J Mix Methods Res*. 2007;1(1):3-7.
  28. Mertler CA. *Action Research: Improving Schools and Empowering Educators*. Fifth edition. SAGE Publications; 2017.
  29. Teddlie C, & Yu F. Mixed methods sampling: A typology with examples. *J Mix Methods Res*. 2007;1(77):77-100. doi.org/10.1177/2345678906292430
  30. *Qualtrics XM* [Computer Software]. Version from January 2021. Provo, UT: Qualtrics: 2021.
  31. Interprofessional Education Collaborative. Core competencies for interprofessional collaborative practice: 2016 update. Published online 2016.
  32. Tylka TL, Annunziato RA, Burgard D, et al. The Weight-Inclusive versus Weight-Normative Approach to Health: Evaluating the Evidence for Prioritizing Well-Being over Weight Loss. *J Obes*. 2014;2014:1-18. doi:10.1155/2014/983495

33. *Desire2Learn Brightspace* [Computer Software]. Version 20.20.01. Kitchener, Canada: Desire2Learn; 2020.
34. Norris J, Carpenter JG, Eaton J, et al. The Development and Validation of the Interprofessional Attitudes Scale: Assessing the Interprofessional Attitudes of Students in the Health Professions. *Acad Med*. 2015;90(10):1394-1400. doi:10.1097/ACM.0000000000000764
35. Bhanji F, Gottesman R, de Grave W, Steinert Y, Winer LR. The Retrospective Pre-Post: A Practical Method to Evaluate Learning from an Educational Program. *Academic Emergency Medicine*. 2012;19(2):189-194. doi:10.1111/j.1553-2712.2011.01270.x
36. Drennan J, Hyde A. Controlling response shift bias: the use of the retrospective pre-test design in the evaluation of a master's programme. *Assess Eval High Educ*. 2008;33(6):699-709. doi:10.1080/02602930701773026
37. *SPSS 25* [Computer Software]. Version 25.0. Armonk, NY: IBM; 2017.
38. Fraenkel JR, Wallen NE. *How to Design and Evaluate Research in Education*. 6th ed. McGraw-Hill; 2006.
39. *HyperRESEARCH* [Computer Software]. Version 4.5.2. Randolph, MA: Researchware, Inc.; 2021.
40. Creswell JW. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Sixth edition. Pearson; 2019.
41. Saldaña J. *The Coding Manual for Qualitative Researchers*. 3E [Third edition]. SAGE; 2016.
42. Field AP. *Discovering Statistics Using IBM SPSS Statistics*. 5th edition, North American edition. Sage Publications Inc; 2018.
43. Vaske JJ, Beaman J, Sponarski CC. Rethinking Internal Consistency in Cronbach's Alpha. *Leis Sci*. 2017;39(2):163-173. doi:10.1080/01490400.2015.1127189
44. Earland J, Gilchrist M, McFarland L, Harrison K. Dietetics students' perceptions and experiences of interprofessional education: Dietetic students' experiences of IPE. *J Hum Nutr Diet*. 2011;24(2):135-143. doi:10.1111/j.1365-277X.2010.01141.x
45. Liller KD, Pruitt Z, Burke SG. Interprofessional Education: Reaching Health Professionals With an Interactive Professional Virtual/Online Event on Advocacy and Policy. *Front Public Health*. 2020;8:606394. doi:10.3389/fpubh.2020.606394
46. Addy CL, Browne T, Blake EW, Bailey J. Enhancing Interprofessional Education: Integrating Public Health and Social Work Perspectives. *Am J Public Health*. 2015;105(S1):S106-S108. doi:10.2105/AJPH.2014.302502
47. Averill MM, Dillon-Sumner L, Stergachis A, et al. Integrating public health students into interprofessional education. *J Interprof Care*. 2020;34(3):427-430. doi:10.1080/13561820.2019.1690436
48. Darlow B, Brown M, Gallagher P, et al. Longitudinal impact of interprofessional education on attitudes, skills and career trajectories: a protocol for a quasiexperimental study in New Zealand. *BMJ Open*. 2018;8:e018510. doi: 10.1136/bmjopen-2017-018510

