



Identical Instruction May Lead to Divergent Learning Outcomes: A Comparison of Changes in Learner Attitudes Towards Interprofessional Practice Following an Interprofessional Education Program

ORIGINAL RESEARCH

DOUGLAS S. ANDER

BETH DAVIS

HUGH STODDARD

*Author affiliations can be found in the back matter of this article



ABSTRACT

Introduction: Interprofessional education (IPE) and health system science have become cornerstones of pre-clinical curricula for healthcare professions education. IPE activities generally assume all learners will achieve similar outcomes from sharing an educational experience; however, assimilation theory of education suggests that prior learning will impact how learners experience IPE events. This pilot study compared attitudinal outcomes of pre-clinical learners from 6 healthcare professions following shared IPE events.

Methods: Participants were in their first year of an educational program leading to initial licensure as a healthcare professional. The “Remote Interprofessional Platform for Learning and Education” (RIPE) program comprised 5 sessions (conducted remotely due to COVID pandemic restrictions) with one introductory session and 4 additional sessions over 12 months. The Nebraska Interprofessional Education Attitude Survey (NIPEAS) was administered to participants prior to and following the IPE series.

Results: Substantial differences were observed between the various programs in terms of learners’ attitude changes. In two domains, most learners expressed greater positivity after the intervention; however, for “working as a team”, learners from 0/6 programs increased in positivity and one program’s score decreased after the IPE program.

Discussion: These pilot results suggest learning together might not automatically generate desired outcomes for all learners in equal measure. Future exploration into whether better outcomes would result if learners were acculturated into their own profession prior to IPE programs is warranted. Although mass IPE events create powerful images of unity and common learning, these perceptions may be illusory.

Implications for Practice: This work is based on an annual team training workshop for all health science students. Like many schools we have one large session to disseminate the IPEC core competencies. We hypothesized that although efficient albite a challenge to implement that the outcomes may not be similar across disciplines. Mass events of IPE create a powerful image of unity and common learning. Such perceptions may be illusory.

ORRESPONDING AUTHOR:

Douglas S. Ander

Emory University School of
Medicine, US

dander@emory.edu

TO CITE THIS ARTICLE:

Ander, D. S., Davis, B., & Stoddard, H. (2024). Identical Instruction May Lead to Divergent Learning Outcomes: A Comparison of Changes in Learner Attitudes Towards Interprofessional Practice Following an Interprofessional Education Program. *Health, Interprofessional Practice and Education*, 6: 2, 1–6. DOI: <https://doi.org/10.61406/hipe.317>

This study highlights the need to question and possibly alter the underlying assumptions of IPE and should be used to guide future IPE programming.

HIGHLIGHTS

- Learners from different professions might not achieve similar outcomes from an IPE program.
- Learners assimilate IPE programs into their own professional identity formation in unique ways.
- Learner attitudes towards an IPE competency may be independent of other competencies.

INTRODUCTION

Interprofessional education (IPE) is an essential component of health system science (Gonzalo et al., 2020) and a cornerstone of the foundational sciences (Schorn et al., 2014) that prepares learners for collaborative care to improve healthcare outcomes. In fact, IPE, teamwork, and other health systems sciences have become testable material for medical licensing exams in the United States (National Board of Osteopathic Medical Examiners, 2024; United States Medical Licensing Examination, 2024). As a result of the pandemic, IPE champions at our university transformed our single IPE in-person day that occurred during the pre-clinical phase of the education programs into a longitudinal, multi-event, remote, small-group, educational experience (Schorn et al., 2014). This program was titled, “Remote Interprofessional Platform for Learning and Education” (RIPLE).

While attitudes towards teamwork likely take years of education and experience to fully develop, we had generated evidence from prior years that a similar, albeit in-person, program contributed to improving interprofessional communication skills (Davis et al., 2023). It was unknown if a fully remote program could produce the desired outcomes in learner attitudes. A study was designed and conducted to measure and compare the attitudinal outcomes of pre-clinical learners from 6 healthcare education programs at Emory University following a series of collective, longitudinal IPE events.

Interprofessional education activities are founded on the presumption that learners will attain similar educational outcomes resulting from having shared educational experiences (Bogossian et al., 2023; WHO, 2010). In other words, healthcare professions trainees who experience IPE events together are expected to learn common outcomes from those events. For example, IPE should “engage students of different professions in interactive learning with each other” (Interprofessional Education Collaborative [IPEC], 2016). Additionally, accreditation standards set by most healthcare education program in the United States

require some IPE experience (Zorek & Raehl, 2013). Given these stimuli for IPE, educational programs that features activities for learners from multiple healthcare training programs participating together in large-scale events are commonly utilized for schools to teach interprofessional teamwork skills and to meet accreditors’ IPE expectations (Bogossian et al., 2023; Abu-Rish et al., 2012).

Nonetheless the cognitive principle of “assimilation theory” (Ausubel, 2011) suggests that learners from the various training programs will have some systematic differences in their cognitive structures for learning – based on their past and ongoing participation in unique educational programs. That is, the pre-existing mental schema for understanding IPE instruction differs between learners of the various educational programs which could lead them to diverse ways of assimilating that instruction and channel them toward dissimilar learning outcomes (Ausubel, 2011). This concept suggests that learners from diverse healthcare training programs might not arrive at similar learning outcomes despite having participated in a collective, longitudinal IPE program. Past studies in IPE have focused on the learner outcomes of all participants with little attention given to potential differences in outcomes that correlate to the educational program.

Given that all learners from all programs underwent the same curriculum with the same parameters, we assumed that learner outcomes for learners of all programs would be similar. A study was conducted to evaluate the RIPLE curriculum in terms of learner attitude changes that may have resulted from that curriculum and we hypothesized that learners from different professions may have reached divergent outcomes.

METHODS

Study participants were learners enrolled in the first 4–6 months of the first year of their educational program leading to initial licensure as a healthcare professional.

Participating programs and level included Anesthesiologist Assistant (Masters), Genetic Counseling (Masters), Medicine (Doctoral), Nursing (Baccalaureate), Physical Therapy (Doctoral), and Physician Assistant (Masters). These programs are abbreviated as AA, GC, MD, SON, DPT, and PA respectively. The RIPLE program comprised 5 sessions with one introductory session and 4 additional sessions throughout the year. All five sessions were conducted remotely due to COVID pandemic restrictions. The COVID pandemic provided an opportunity to deploy remote educational platforms that had not previously been utilized. The learning objectives of the RIPLE program were similar to previous in-person IPE events and aligned with the Interprofessional Education Collaborative (IPEC) core competencies and needs of stakeholders (IPEC, 2016).

The learning objectives of each session focused on one or more of the four competency domains published by the IPEC (IPEC, 2016). Instructional formats included: panel discussion, reflective writing, role playing, and small group discussions. Each small group session was led by a trained, faculty facilitator. Facilitator training was multi-modal including providing them with the syllabus and a PowerPoint presentation summarizing key learning points. The facilitators also received a video that reviewed key teaching points. Topics, which included COVID, Sickle Cell Disease, and the Opiate crisis, were chosen to highlight recent events, disparities in care, and public health responses.

The Nebraska Interprofessional Education Attitudes Survey (NIPEAS) (Beck Dallaghan et al., 2016) had been created to gauge self-reported attitudes towards IPEC competencies. The RIPLE curriculum was also designed from IPEC competencies, thus, the NIPEAS was selected to measure learner outcomes owing to this alignment. The NIPEAS was administered to participants prior to their first RIPLE event and again following the final event. Pre-RIPLE results for each NIPEAS item were statistically compared to post-RIPLE results using t-tests within each program's learner group. Additionally, the mean change score (Post – Pre) for the six program groups were compared using 2-way ANOVA. This study was determined by the Emory University IRB to not be research on human subjects as evaluation of an educational program.

RESULTS

There were substantial differences in Pre-to-Post scores for 11/19 NIPEAS items (Table 1 t-test results).

Within the NIPEAS factor titled, “Self-efficacy in Interprofessional Care,” there were statistically significant increases in Pre-to-Post scores for each of the 4 items as

well as significant Pre-to-Post increases for 4/6 participating educational programs. Similarly, in the “Learning with Others” factor the Pre-to-Post scores increased for 3/4 items and for 3/6 programs. In contrast, the Pre-to-Post scores actually decreased significantly for 3/9 items in the “Working as a Team” factor. In effect, learners’ attitudes were less favorable after the RIPLE curriculum towards these facets of IPE than they were before completing any training. Learners from 4/6 different educational programs had significantly less favorable attitudes on multiple items after RIPLE than they had prior to the events.

For 3 of the NIPEAS items, the programs differed from each other in terms of how much the scores had changed from Pre-to-Post (Table 1 ANOVA results). For two of these items, NIPEAS 1 and NIPEAS 2, 4/6 programs had significant increases in Pre-to-Post scores, while 2/6 had scores that did not change statistically. For NIPEAS 5, 3/6 programs had Pre-to-Post scores that showed significant decreases while the other 3 did not have significant changes.

DISCUSSION

The mixed results described above and presented in Table 1 call into question the common assumption that learners from various healthcare professions educational programs will inevitably achieve the desired IPE learner outcomes in equal measure. The intuitive logic of incorporating learners from multiple professions into IPE events like RIPLE is attractive; however, these data suggest that closer scrutiny is warranted. The results show that 2/6 programs (AA and SON) had significantly more positive attitudes on at least 7 of the 19 NIPEAS items with no significant decreases in Pre-to-Post scores; meanwhile two other programs (GC and PA) had the opposite result with significantly decreased scores on two items and no increases in Pre-to-Post scores. The remaining two programs had significant score increases on some items and decreases on others. Although there is not an overriding pattern to these results, it is clear that the learners from different educational programs do not change their attitudes towards IPE in the same way or at the same rate despite having undergone RIPLE training together.

We suspect that in a longitudinal curriculum, like RIPLE, the learners will assimilate those IPE events into their own professional identity formation in unique ways based on what they have absorbed through their non-IPE curricula. It is also possible that the remote nature of RIPLE instruction, although unavoidable due to the COVID restrictions at that time, had an impact on learner engagement in the events and thus, on the outcomes of those events. That is, the lack of face-to-face interpersonal communication with and from other professional learners and faculty facilitators professions may

have contributed to the decrease/no change result in attitudes related to “working as a team,” since an interprofessional team experience is difficult to create virtually.

These pilot results call for expanded investigation and further exploration into whether better learner outcomes would result if learners were all more acculturated into their own profession prior to learning about other professions (Bogossian et al., 2023). For example, deeper study is needed regarding whether providing a robust cognitive schema for interprofessional practice within one’s own profession before introducing IPE alongside of learners from other healthcare education programs would lead to more consistent improvement in attitudes for all IPEC competencies (IPEC, 2016). Solidifying a learner’s professional identity formation within their own role may improve their understanding and appreciation for the roles of other providers (Bogossian et al. 2023; Khalili & Price, 2022). Logically, IPE instructional events should be sequenced such that learners in pre-clinical or foundational science phases of a program acquire the knowledge, skills, and attitudes of teamwork and communication in a manner that facilitates transfer into the clinically-based phases of the program. The sequencing of IPE instruction is also relevant in that some competencies, such as role definitions, can likely be achieved intra-professionally prior to having direct contact with other professions while other competencies, such as teamwork, are best learned through interprofessional interactions. Additional consideration and rigorous study of curriculum sequencing factors will be crucial to designing effective IPE methods that will shape learners’ professional identity.

Limitations of this single-cohort, pilot study include the fact that considerable time elapsed between the first and final event, during which factors other than the IPE events themselves may have influenced learners’ attitudes or may have affected their response process on this self-report instrument. Additional factors impacting outcomes of the study include the timing of RIPLE within the sequence of each program’s curriculum. On an individual level, learners’ personal and professional experiences prior to professional training may also impact outcomes of attitudes related to interprofessional teamwork. Our learners have a multitude of previous experiences. We did not track those previous clinical or team-based experiences so it is unclear if they would impact our results. In our future work we will document these experiences however further work would need to be done to determine the impact based on the teamwork aspects of that work. This was a fully remote program due to COVID-19 however we did not track previous online learning. While this may have impacted our outcomes, we believe that most students would have experienced remote educational modalities prior to participation in this program.

CONCLUSION

Large-scale IPE events create a powerful image of unity and common learning, but these perceptions may be illusory. Although this study does not prescribe a formula for making training in interprofessional teamwork more effective, it does highlight a need to probe the underlying assumptions of IPE. The goal of IPE is to graduate learners who will function well in the interdisciplinary environment of our healthcare systems. Further work in this field should continue to explore the timing of IPE and the precise content and best platforms for delivery of an IPE curriculum. The field is still exploring how to create best IPE practices for all participating health professions and our study informs this continued investigation.

FUNDING INFORMATION

This research was conducted with no research funding.

COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR CONTRIBUTIONS

Each author contributed equally to the design, implementation, data analysis and manuscript development.

AUTHOR AFFILIATIONS

Douglas S. Ander  orcid.org/0000-0002-8944-4585

Emory University School of Medicine, US

Beth Davis  orcid.org/0000-0002-5231-1770

Emory University School of Medicine, US

Hugh Stoddard  orcid.org/0000-0002-7720-0655

Baylor College of Medicine, US

REFERENCES

- Abu-Rish, E., Kim, S., Choe, L., Varpio, L., Malik, E., White, A. A., Craddick, K., Blondon, K., Robins, L., Nagasawa, P., Thigpen, A., Chen, L. L., Rich, J., & Zierler, B. (2012). Current trends in interprofessional education of health sciences students: literature review. *Journal of interprofessional care*, 26(6), 444–451. DOI: <https://doi.org/10.3109/13561820.2012.715604>

- Ausubel, D. P.** (2011). *The acquisition and retention of knowledge: A cognitive view*. Springer.
- Beck Dallaghan, G. L., Lyden, E., Meza, J., Stoddard, H., Bevil, C., Collier, D., Winnicki, M., & Nickol, D.** (2016). The Nebraska interprofessional education attitudes scale: A new instrument for assessing the attitudes of health professions students. *Journal of Interprofessional Education and Practice*, 4, 33–39. DOI: <https://doi.org/10.1016/j.xjep.2016.05.001>
- Bogossian, F., New, K., George, K., Barr, N., Dodd, N., Hamilton, A. L., Nash, G., Masters, N., Pelly, F., Reid, C., Shakhovskoy, R., & Taylor, J.** (2023). The implementation of interprofessional education: a scoping review. *Advances in health sciences education: theory and practice*, 28(1), 243–277. DOI: <https://doi.org/10.1007/s10459-022-10128-4>
- Davis, B. P., Mitchell, S. A., Weston, J., et al.** (2023). Situation, Background, Assessment, Recommendation (SBAR) education for health care students: assessment of a training program. *MedEdPORTAL*, 19, 11293. DOI: https://doi.org/10.15766/mep_2374-8265.11293
- Gonzalo, J. D., Chang, A., Dekhtyar, M., Starr, S. R., Holmboe, E., & Wolpaw, D. R.** (2020). Health Systems Science in Medical Education: Unifying the Components to Catalyze Transformation. *Academic Medicine: Journal of the Association of American Medical Colleges*, 95(9), 1362–1372. DOI: <https://doi.org/10.1097/ACM.0000000000003400>
- Interprofessional Education Collaborative.** (2016). *Interprofessional Education Collaborative, Core competencies for interprofessional collaborative practice: 2016 update*. Washington, DC: Interprofessional Education Collaborative.
- Khalili, H., & Price, S. L.** (2022). From uniprofessionality to interprofessionality: dual vs dueling identities in healthcare. *Journal of interprofessional care*, 36(3), 473–478. DOI: <https://doi.org/10.1080/13561820.2021.1928029>
- National Board of Osteopathic Medical Examiners.** (2024). *Competency domain 1: Systems-based practice in osteopathic medicine*. <https://www.nbome.org/assessments/complex-usa/master-blueprint/competency-domains/systems-based-practice/>
- Schorn, M. N., Wu, A., Davidson, H. A., et al.** (2014). Interprofessional Education (IPE): Synchronous, Asynchronous, Clinical Practice, Simulation Across Disciplines, Across Universities. *Med. Sci. Educ.*, 24(Suppl 1), 9–11. DOI: <https://doi.org/10.1007/s40670-014-0086-2>
- United States Medical Licensing Examination.** (2024). USMLE® content outline. https://www.usmle.org/sites/default/files/2022-01/USMLE_Content_Outline_0.pdf
- WHO.** (2010). *Framework for action on interprofessional education & collaborative practice*. https://apps.who.int/iris/bitstream/handle/10665/70185/WHO_HRH_HPN_10.3_en
- Zorek, J., & Raehl, C.** (2013). Interprofessional education accreditation standards in the USA: a comparative analysis. *Journal of interprofessional care*, 27(2), 123–130. DOI: <https://doi.org/10.3109/13561820.2012.718295>

TO CITE THIS ARTICLE:

Ander, D. S., Davis, B., & Stoddard, H. (2024). Identical Instruction May Lead to Divergent Learning Outcomes: A Comparison of Changes in Learner Attitudes Towards Interprofessional Practice Following an Interprofessional Education Program. *Health, Interprofessional Practice and Education*, 6: 2, 1–6. DOI: <https://doi.org/10.61406/hipe.317>

Submitted: 29 December 2023 **Accepted:** 09 March 2024 **Published:** 01 April 2024

COPYRIGHT:

© 2024 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.

Health, Interprofessional Practice and Education is a peer-reviewed open access journal published by Pacific University Libraries.