Student Evaluation of Interprofessional Experiences between Medical and Graduate Biomedical Students

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Abstract

Background: Interprofessional education (IPE) has fostered increased collaboration and appreciation for different disciplines among health professionals but has yet to be established in a translational research setting. Interprofessional experiences (IPEx) implemented early in student training could increase translational research productivity.

Methods and findings: Ten students involved in an IPE curriculum wrote autoethnographic accounts that were coded and emergent themes were grouped through constant comparative analysis. IPE led to improvements in communication, trust, appreciation, and an increased desire to seek IPE in future careers. Challenges included administrative barriers and interpersonal conflicts.

Conclusions: Participants found IPE beneficial to their careers and developed a respect for each other's discipline. To implement IPE, institutions should consider possible administrative challenges and inclusion of conflict management training.

Keywords: Interprofessional experience; Interprofessional education; Problem-based learning; Biomedical training; Medical students; Graduate students

Introduction

Interprofessional experiences (IPEx) in healthcare education refer to instances in which students of two or more professional tracks learn in a shared environment tailored to their combined educational goals, with the aim of fostering future collaborations to improve patient-centred healthcare through enhanced interprofessional interactions. It is now recognized for its value to both patients and students, and interprofessional education (IPE) is increasing in clinical training programs. In 2010, the World Health Organization [1] published a framework for implementing IPE and collaborative practice. Healthcare professionals who have been exposed to IPE during training perform better on metrics of patient care—including patient satisfaction, clinical error rates, and collaboration [2,3]. In clinical settings involving

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different health professionals, IPE also improves patient-centred communication [4]. Nursing and medical students who underwent an interprofessional course together reported increased recognition of a common goal, as well as increased competence and confidence in their ability to respond to conflict [5].

One model used in IPE is the problem-based learning (PBL) model, and students in this study took part in this model. Rintaro Imafuku, Ryuta Kataoka, Mitsuori Mayahara, Hisayoshi Suzuki, and Takuya Saiki [6, p. 1] describe the PBL model in IPE as a "learner-centered approach." In PBL, interactive knowledge acquisition is combined with interprofessional interactions with other students. This leads to the development of an increased understanding of personnel from other professions [6]. Work experience is the other common paradigm for IPE training in a medical setting. The Interdisciplinary Family Health course at the University of Florida Health Science Center is an example of a work experience-based approach to IPE. Its paradigm revolves around providing services to volunteer families as well as collaboration between students from four health profession colleges, which results in tangible health benefits for the community [7].

Although there is a wealth of knowledge covering the effects, implementations, and models of interprofessional healthcare education, there is an absence of literature regarding the effects of an IPE environment on both medical students and biomedical PhD-seeking students who wish to be mutually engaged in translational research. Biomedical graduate students undergo radically different training in school and end up in very different environments from those of medical students. Students seeking PhDs who are interested in biomedical research often have little to no interactions with patients. Even if their work involves human samples, they are often not engaged in patient-centred activities—unlike other students of the typical IPE group, including nurses, doctors, and physician assistants. Medical advances and improvements in patient care rely on research and, reciprocally, biomedical research relies on solving emerging problems in medicine. The bi-directional interaction of research and medical practice is what generates targets of inquiry and justifications of study, while the products of research inform and eventually advance medical practice. Hospitals often have the capital and facilities to house large research efforts, and academic institutions often aim to add research into the training of medical professionals. Academic medical research is increasingly being driven by hospitals and industry, thus the co-education of both future PhD-level scientists and medical doctors (MDs) might help foster better collaborations between them. As stated by Imafuku et al. [6], PBL IPE is a learner-focused approach, and it is optimal for co-educating these two student populations to enhance future collaboration. A PBL-IPE curriculum with a medical training focus might therefor be particularly suitable for a cohort of MD students and biomedical PhD students.

This study addresses IPEx between biomedical graduate students and medical students because the combination of these populations has not been well studied. Previous studies have addressed cohorts of mixed medical students and MD-PhD combined degree-seeking students, but not typical graduate students and medical students. This study follows the first-year education of these two groups of students in a

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PBL-IPE-based approach. It uses an autoethnographic framework with questions informed by the literature to guide the participants in writing reflective narratives on their IPEx. The study uses autoethnography with the aims of understanding the group dynamics typical of these combined medical and graduate-student teams and identifying the potential benefits and challenges that emerge in this style of IPE.

Materials and methods

Study design

This study involves a collection of autoethnographic accounts from students who had directly participated in multiple PBL-style IPEx. The majority of these PBL-style IPEx ran simultaneously with didactic coursework and functioned as a supplement to further the students' understanding of material learned from lectures. However, an additional PBL-style IPEx served a unique role, aiding in the acquisition of team-based grant writing skills. Due to the young stage of development of the participating medical and biomedical graduate students within their respective careers, a work experienced-based IPE was not chosen. The autoethnographic design allowed for data to be collected with an emic approach and through the viewpoint of an insider. An autoethnography is a narrative written by an individual participant of a study, a non-embellished and analytical explanation of their experience that is further evaluated and reflected on by each original author and others [8]. Autoethnographies in this study consist of autobiographical accounts provided by participants regarding their experiences. The entire group analyzed them as raw data for analysis. Due to the unique nature of each person's experiences and the retrospective nature of this study, the emic approach, which consists of self-reporting, was selected instead of an etic approach, which would have involved an external observer's account. The autoethnographic accounts consisted of self-reflective descriptions of the course-based IPE outlined below. Several different forms of autoethnography exist, each with its own strengths and weaknesses, including descriptive-realistic, confessional-emotive, analytical-interpretive, and imaginative-creative [8]. This study used the analytical-interpretive autoethnographic design, which involves an accurate and specific account of events as they relate to the broader theme of education [9]. The study required the individual preparation of autoethnographic accounts of interprofessional education, which were discussed in detail during group meetings. The accounts were exclusively based on student experiences from one year with IPE-style classes. These classes covered both medical school core content (anatomy, histology, and immunology) and graduate school content (grant writing). As part of the medical school courses, groups of medical and graduate biomedical students were required to participate in PBL-style exercises centred on case studies of patients with various diseases.

The PBL-style courses met for two hours, three days a week. They consisted exclusively of medical students interested in scientific research and graduate biomedical students with, on average, eight students per class. Each week, students were presented with a case study in which they were required to diagnose a patient

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and then gain a further understanding of the disease mechanisms driving the patient's symptomology. In the first session, students typically worked to put together a list of potential diseases/disorders that they would then divide among the group for further study. In the second session, they would report to one another on their findings and then decide as a group which diagnosis was the most likely for their patient. A facilitator was present in the room, and s/he was either a physician or biomedical scientist faculty member at the institution. However, the facilitator was not allowed to answer questions but was present merely to guide the discussion and ensure that it was a fruitful learning experience. Each medical school course had a concurrent PBL-IPE course, and the medical and biomedical graduate school students spent approximately six months together in these courses.

For the grant writing course, a PhD-seeking graduate student was grouped with two to three medical students and the group was asked to write a National Institutes of Health (NIH) R21-style grant proposal on a topic of their choice. The eight-week course ran for two hours on two days each week, though students also met extensively outside of class time in order to accomplish the writing goal. This course did not have a facilitator for each group. Groups made regular presentations to faculty and fellow students to offer updates on their progress. Faculty members were also present to provide an initial introduction to the course and later guide the students as necessary.

The grant-writing course experience combined with the PBL experiences comprised the IPEx that students were asked to reflect upon in their emic autoethnographic narrative. After they were written, the narratives were discussed in a group setting and then edited individually to provide additional details and examples, without alterations to the main ideas. Subsequently, analysis was performed in a similar group setting.

Participants

A total of ten participants were involved in the study and all were enrolled as full-time students at a research-intensive medical and graduate university. Participants were recruited through an email request to all students enrolled in the translational medicine graduate program or the medical school translational research track. Participation was fully voluntary. The students came from different educational backgrounds and different schools within the university. Demographically, the female-to-male ratio was six to four, and the ethnic breakdown was five Caucasian Americans, two Asian Americans, two multiracial Americans, and one African American student. Six participants were graduate students, three were medical students, and one student was in the MD-PhD program. Students represented varying stages of degree completion, some were in their early years while others were near graduation.

The participants also had varying amounts of experience with interprofessional education prior to attending the courses that they wrote their autoethnographies on. Both the medical and graduate students were members of a program in which they took introductory medical courses and an interprofessional summer course requiring the team-based development of an NIH-style grant. A breakdown of the participants is described in Figure 1.
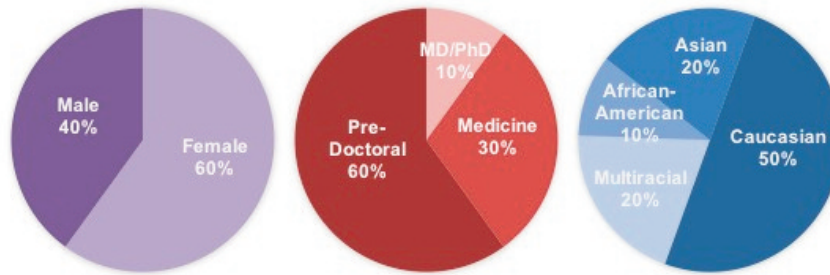
Figure 1. Participant demographics

Dependability/biases

The credibility and dependability of the study were established using the framework provided by Yvonne Lincoln and Egon Guba [10], which consists of credibility, transferability, dependability, and confirmability. Credibility is a marker of how dependable the results of a study are in the context of reality. In this study, credibility was maintained through the use of an established method for analyzing the data (i.e., constant comparative analysis). Additionally, frequent group sessions and open discussions of the autoethnographic accounts also further enhanced credibility. The team of five participants involved in coding alternated duties of coding and data analysis. Participants also provided a final check of the analysis to ensure that their account was interpreted correctly, an additional measure ensuring credibility [10,11].

Dependability is based on how accurate and consistent a study is and how well it can be replicated using the same resources. Dependability in this study was ensured through the use of a stepwise replication approach, in which the research team was divided into two groups: one group was responsible for coding the data, while the other was responsible for reviewing the codes. Then, as a group, the researchers discussed any coding discrepancies between the two groups and consolidated the analyses. Another measure used was a code-recode procedure: the researchers spread data analysis into multiple weeks and revisited the data to ensure that the same codes were extracted from it.

Transferability and confirmability were also addressed. Transferability determines how well the study can be replicated by an independent researcher [11]. The research team documented the data collection and analysis process meticulously in the methods section of this article. The detailed description is meant to guide an independent research team that is interested in using the same methodological approach. Similarly, confirmability depends on the results being representative of the views of the informants and not the preconceptions/biases of the researcher [11]. The nature of this study, an autoethnography, assists in diminishing this problem, since the accounts are presented by participants themselves and not by a third-party reviewer. Additionally, written accounts were referred to consistently for data analysis, and direct quotes from participants were used to highlight key results. In addition, to maintain confirmability, researchers are also expected to make their preconceptions known [11]. Therefore, to address biases, all participants were asked to describe factors that may have influenced how they viewed their IPEx such as biases related to gender, ethnicity, or personal experiences. Each participant wrote

a paragraph addressing bias as part of his or her narrative. It is interesting to note that the majority of the participants relayed biases for their professional and academic background, as well as other personal characteristics. Finally, although the presence of biases and the influence of differences in the institutional organization of these programs cannot be completely eliminated, studies done in other IPE settings involving medical and graduate biomedical students should yield similar results.

Procedures

A schematic of the study procedures is shown in Figure 2. Phase 1 consisted of recruitment. In phase 2, study participants were asked to write a minimum one-page emic autoethnographic account (most participants provided approximately three pages) of their IPEx focusing on, but not limited to, the following three prompts:

1 What are the strengths of the interprofessional learning experience (IPEx)?
2 What are the challenges of IPE?
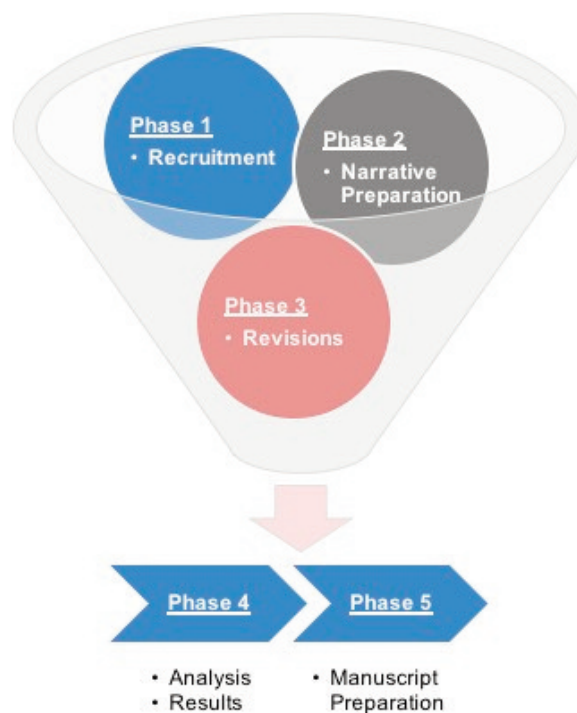3 How did your IPEx affect your future career goals?

Figure 2. Study procedure

Additionally, participants recorded a brief account of their academic choices and educational background. Participants were also encouraged to discuss experiences and events that influenced their choice to pursue a career in medical science. Phase 3 involved a group discussion of the initial submission, and authors were provided direct group feedback to elaborate, revise, and expand on portions of their auto-

ethnographic accounts to address issues that needed clarification or elaboration. The revised versions were also discussed in a group setting. Prior to entering the analysis, an open discussion was held regarding participants' experiences.

Analysis

After the revisions in phase 3, the data were analyzed using the constant comparative analysis method [12], and results were generated in phase 4. The revised accounts were used for analysis. These revised accounts included the clarification of comments and ideas presented by each participant, as well as concrete examples from their individual IPEx. This study focused on experiences and integrating themes related to interprofessional education in order to determine underlying strengths, weaknesses, and future directions for the program. A team of five participant-authors conducted the analysis, and the remainder of the group reviewed it upon completion. The analysis team identified ideas, concepts, and relationships from each narrative and recorded them as categorical codes, such as "trust" and "camaraderie." These codes were further reviewed for consistency and alignment. Once coding was performed on all the narratives, recurring patterns were determined. The codes were further combined into larger themes by the coding team, for example, "team skills" and "educational considerations."

Results

After the analysis of the narratives, several concepts emerged, including the development of team skills, educational considerations, and personal growth. These concepts were further classified into themes, as described below.

Team skills

Many skills are necessary for effective teamwork, especially when the team is composed of individuals from different disciplines and/or professions. Susan Nancarrow, Andrew Booth, Steven Ariss, Tony Smith, Pam Enderby, and Alison Roots [13] describe ten characteristics that are important for an interprofessional team to function effectively. Each of these characteristics is mentioned in at least one of the narratives. Appearing across several narratives are codes relating to the characteristics of climate (trust), respecting and understanding roles (camaraderie), appropriate skill mix and individual characteristics (exemplified by peer mentoring), and communication (common language).

Trust

Trust was built between students during the course of the year as their interactions spanned both clinically-related and basic science-themed learning. It was mentioned in several narratives that by the end of the coursework, students felt secure in asking for help from their colleagues and no longer felt threatened by fear of giving a wrong answer.

> [I] felt more comfortable asking whatever question was on my mind.

Camaraderie

Many narratives began with an introduction detailing the biases and misconceptions that different professions held from their perspective. However, the majority of the participants had a strong desire to challenge and overcome these biases. In describing their group interactions in the PBL-style IPEx, participants expressed a strong appreciation for the time and effort put in by the other group of students (e.g., MD- or PhD-seeking students), and noted how students from each group thought through problems differently. Initially, the medical students focused more on directly modulating patient treatment/outcomes and graduate students focused more on the underlying molecular mechanisms leading to disease. However, with their shared experiences, each member of the group was able to gain further insight into disease processes and treatments, and many noted how this multifaceted way of approaching medicine enhanced the members' overall knowledge.

> The most important lesson I obtained from [the program] was that both professions' major aim is to improve the health condition of the general population in the end.

> I felt we were bound by the notion that we were all facing the same battle and respected each other's needs.

Peer mentoring

Several students recalled peer mentoring and teaching throughout their experience. Examples of this included the recognition that another student or group of students had a different background, be it knowledge or experiences. The student would then seek out help from a peer who had a better grasp of the topic at hand.

Common language

Communication was made easier by the establishment of a common technical language between the two groups. The graduate students in particular mentioned a rift between the disciplines due to professional jargon used in clinical practice. They felt that by learning the language of the medical community they were, and would continue to be, better suited to interact and communicate with medical professionals: "knowledge of the medical jargon has aided me in being able to understand and interpret findings in medical journals." Graduate students felt that they were more confident in carrying on a conversation with a physician as a consequence of IPE, both in understanding the physician's language and in describing how their research would impact the current state of healthcare.

Educational considerations

Benefits mentioned in the narratives included the spectrum of background knowledge each of the students brought to the group. Since each individual had his/her own prior experiences and education from different institutions, each brought a unique understanding of various fields. The medical students selected for this program had undergraduate research experience and were therefore better suited to exploring the complexities of diseases presented in the PBL-style IPEs than typical

medical students. Several narratives also described how IPE increased a student's ability to think critically about a problem and explore solutions from multiple angles: "my training … allows me to … ask questions about [another] field and education that I may not have previously."

Misaligned educational goals were occasionally observed between medical and graduate students, as expressed by participants who were in the first and second years of the program. This was due to differences in the immediate educational landmarks for the different groups of students. Students in medicine are expected to have widespread understanding of human disease, whereas graduate students are expected to have in-depth knowledge of their particular field. Due to these differences, the activities of the IPEx did not always satisfy both groups, and students felt burdened. A medical student said: "I sometimes felt burden[ed] to learn both the medical school materials and the graduate school materials …" A graduate student said: "IPE … takes time, and takes the focus away from the respective disciplines. IPE can cause students to become distracted from the focus of their education …"

Administrative barriers existed for graduate students enrolled in medical school classes. As enrollment was separate for the two groups and the total graduate student population was much smaller than the total medical school population, these students noted: "Minor issues included getting delayed access to a resource." This was remedied in some cases by the interprofessional environment, in which medical and graduate students shared formal and informal academic resources. Another administrative barrier, which was experienced by students later in the program, was a loss of contact between the groups when the required classes ended. Conflicting schedules resulted in the medical and graduate students interacting less and less.

Personal growth

Self-concept is defined as "the individual's belief about himself or herself, including the person's attributes and who and what the self is" [14, p. 247]. Throughout all the narratives, the participants mentioned an increase in self-awareness. They felt that they each brought a unique expertise to the group and they were open to sharing their experiences and knowledge. Students were also aware of their own gaps in understanding specific topics. In addition, each group of medical and graduate students appeared to be highly motivated to not only solve the PBL questions but to also delve deeper into the reasons behind their conclusions. This additional understanding led to feelings of fulfillment and accomplishment from the group interactions: "… with our combined efforts, we not only completed our project, but the final product would not have been possible for one person to undertake."

A mention of personality conflicts appeared throughout many of the narratives. These conflicts were mentioned in relation to clashing personalities or communication styles: "Different personalities and learning styles did not always feed a symbiotic relationship. …" In some cases, these were remedied, "… [the events] resolved themselves through active communication and respect.…" In other cases, the conflict persisted and led to feelings of frustration and was "… a distraction at times."

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The desire to seek future interprofessional relationships was mentioned several times throughout the narratives. Participants further along in their schooling indicated openly looking for careers that would involve working with professionals from different disciplines. In addition, they mentioned establishing additional interprofessional connections throughout their time in the IPE program. Others had sought out projects that were especially translational in that they have a direct clinical impact. Finally, participants specified that they felt more comfortable speaking and networking with professionals from different disciplines as a consequence of their IPE.

Discussion

This autoethnographic study is unique because it examines interprofessional experiences between medical students and graduate biomedical students. This study is significant in that it is not only the first of its kind for this combination of students, but it is also able to provide further insight into the challenges and benefits of IPE for these respective groups. Findings from this study may help similar institutions determine if such an interdisciplinary program might prove beneficial to their training curricula.

Previously published challenges of IPE include scheduling, faculty participation, administrative difficulties, appropriate timing, and the need to learn non-clinical skills, such as competencies in interpersonal communication and conflict resolution [15,16]. This study demonstrated similar challenges, including misaligned educational goals, administrative barriers, and personality conflicts.

One advantage of IPE, noted by a literature review performed by Pippa Hall and Lynda Weaver [16, p. 871], is that IPE leads to "role blurring." Interestingly, this was not noted in this study; however, facets that may influence role blurring were observed, including trust, camaraderie, and peer mentoring. One difference between this study and the literature review by Hall and Weaver [16] was the disciplines of the individuals involved. That study involved subjects of healthcare disciplines that might later work together to help patients on a multidisciplinary team. This study, however, involved medical students and graduate biomedical students. These two disciplines do interact, though the push for interaction and cross-disciplinary teams involving doctors of medicine and biomedical science is only a recent trend. Thus, it is unlikely that much role blurring will occur as a consequence of this form of IPE.

Modifying the perception of IPE, particularly emphasizing its benefits, could improve participation and retention in IPE programs. As involvement in IPE increases, the need for further studies assessing IPE methodologies also increases. Though study size does not equal data saturation, and smaller sample sizes may be adequate when certain factors are accounted for (e.g., the heterogeneity of the population is ensured, the attrition rate is low, etc.), a larger sample size may still be of benefit for future IPE studies involving medical and graduate biomedical students [17]. Furthermore, future studies might ensure the involvement of subjects in the IPE program who do not have extensive research experience. The heterogeneity of subjects was otherwise well controlled for in this study: a variety of ethnic back-

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grounds, sub-disciplines in both the science and medical fields, genders, career stages, ages, and multiple schools within the institution were represented.

Finally, future studies might assess IPE using a unique methodology from the study design herein. Though the post-IPE emic autoethnography is useful to characterize the benefits and challenges of IPE, it is important to note that pre-IPE biases may influence the results. A limitation of this study is that it did not include pre-IPE controls to assess changes in attitude toward IPE as a consequence of IPE. However, other studies investigating the role of IPE in students of various healthcare disciplines have suggested that IPE results in positive effects on the attitudes and knowledge of the individuals involved [18,19].

Conclusion

This study provides a distinct perspective on IPE as experienced by medical and graduate biomedical students very early in their professional careers. Autoethnographic accounts by students identified several strengths of early exposure to IPE, including improvements in communication, the development of trust, and increased appreciation for their peers. Along with strengths, several areas requiring improvement were also highlighted. It was noted that this form of education was challenging, as it took time away from other endeavours and not all parties benefited equally. Additionally, combining two unique and separate programs raised several administrative issues as well as conflicts among participating individuals. However, despite these challenges, participants maintained a positive attitude toward IPE overall and expressed enthusiasm for working in IPE teams in their professional careers. In addition to introducing the strengths and weaknesses of IPE, this study also highlighted conflict resolution training as a necessary step forward for future IPE experiences. The study itself was designed to have direct participation from authors to prevent observer biases, and participants represented a diverse group of students with unique backgrounds, scientific interests, and stages of degree completion. However, the study was limited to only ten participants and personal accounts were written after the completion of the IPEx. Therefore, future studies are needed to acquire more comprehensive data on a larger student population and expand on the themes identified by acquiring narratives pre- and post-IPEx. As the field of science becomes increasingly interdisciplinary, this study and future studies are imperative for determining the proper implementations of IPE in order to limit conflicts and improve interprofessional interactions.

Abbreviations

Interprofessional education (IPE)
Interprofessional experience (IPEx)
Problem-based learning (PBL)

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References

1. World Health Organization. (2010). *Framework for action on interprofessional education & collaborative practice.* Geneva, CH: World Health Organization.
2. Barceló, A., Cafiero, E., de Boer, M., Mesa, A.E., Lopez, M.G., Jiménez, R.A., Esqueda, A.L., Martinez, J.A., Holguin, E.M., Meiners, M., Bonfil, G.M., Ramirez, S.N., Flores, E.P., & Robles, S. (2010). Using collaborative learning to improve diabetes care and outcomes: The VIDA project. *Primary Care Diabetes*, *4*(3), 145–153. doi: 10.1016/j.pcd.2010.04.005
3. Reeves, S., Perrier, L., Goldman, J., Freeth, D., & Zwarenstein, M. (2013, March 28). Interprofessional education: Effects on professional practice and healthcare outcomes (update). *Cochrane Database System Review*, *4*(3), 1–47. doi: 10.1002/14651858.CD002213.pub3
4. Helitzer, D.L., LaNoue, M., Wilson, B., de Hernandez, B.U., Warner, T., & Roter, D. (2011). A randomized controlled trial of communication training with primary care providers to improve patient-centeredness and health risk communication. *Patient Education and Counseling*, *82*(1), 21–29. doi: 10.1016/j.pec.2010.01.021
5. Keller, K.B., Eggenberger, T.L., Belkowitz, J., Sarsekeyeva, M. (2013). Implementing successful interprofessional communication opportunities in health care education: A qualitative analysis. *International Journal of Medical Education, 4,* 253–259. doi: 10.5116/ijme.5290.bca6
6. Imafuku, R., Kataoka, R., Mayahara, M., Suzuki, H., & Saiki, T. (2014). Students' experiences in interdisciplinary problem-based learning: A discourse analysis of group interaction. *Interdisciplinary Journal of Problem-Based Learning, 8*(2). doi: https://doi.org/10.7771/1541-5015.1388
7. Davidson, R.A., & Waddell, R. (2005). A historical overview of interdisciplinary family health: A community-based interprofessional health professions course. *Academic Medicine*, *80*, 334–338.
8. Chang, H. (2008). *Autoethnography as method*. Walnut Creek, CA: Left Coast Press.
9. Farrell, L., Bourgeois-Law, G., Regehr, G., & Ajjawi, R. (2015). Autoethnography: Introducing "I" into medical education research. *Medical Education*, 49, 974–982. doi: 10.1111/medu.12761
10. Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry*. Newbury Park, CA: SAGE Publications.
11. Shenton, A.K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*, 63–75. doi: 10.3233/EFI-2004-22201
12. Glaser, B.G. (1965). The constant comparative method of qualitative analysis. *Social Problems*, *12*, 436–445. doi: 10.1525/sp.1965.12.4.03a00070
13. Nancarrow, S.A., Booth, A., Ariss, S., Smith, T., Enderby, P., & Roots, A. (2013). Ten principles of good interdisciplinary team work. *Human Resources for Health*, *11*, 19. doi: 10.1186/1478-4491-11-19
14. Baumeister, R.F. (1999). *The self in social psychology.* Philadelphia, PA: Psychology Press.
15. Barnsteiner, J.H., Disch, J.M., Hall, L., Mayer, D., & Moore, SM. (2007). Promoting interprofessional education. *Nursing Outlook*, *55*(3), 144–150. doi: 10.1016/j.outlook.2007.03.003
16. Hall, P., & Weaver, L. (2001). Interdisciplinary education and teamwork: A long and winding road. *Medical Education*, *35*, 867–875. doi: 10.1046/j.1365-2923.2001.00919.x
17. Burmeister, E., & Aitken, L.M. (2012). Sample size: How many is enough? *Australian Critical Care*, *25*, 271–274. doi: 10.1016/j.aucc.2012.07.002
18. Remington, T.L., Foulk, M.A., & Williams, B.C. (2006). Evaluation of evidence for interprofessional education. *American Journal of Pharmaceutical Education*, *70*, 66. doi: 10.5688/aj700366
19. Giordano, C., Umland, E., & Lyons, K.J. (2012). Attitudes of faculty and students in medicine and the health professions toward interprofessional education. *Journal of Allied Health*, *41*, 21–25.

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