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# THE POWER OF INTERPROFESSIONAL EDUCATION TO ENHANCE COMPETENCY- BASED LEARNING IN HEALTH INFORMATICS AND POPULATION HEALTH STUDENTS

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## ABSTRACT

This project highlights the importance of educating students on digital data collection for population health using interprofessional education (IPE) activities. Junior- and senior-level Health Services students enrolled in two classes (Health Informatics and Health Promotion) were trained on the use of technology-driven data collection tools and survey development to collect data at an annual university wellness fair. The goal of this activity was to enhance students' comprehension of classroom knowledge and readiness to participate in professional activities through interprofessional collaboration. Students participated in joint training sessions prior to the fair and were then paired in interprofessional teams to collect data at a local university wellness fair. Following the fair, students utilized the data generated to bring the learning activity full circle. Post-activity surveys were sent to students to evaluate. Students' health informatics competencies evolved as a result of this technology-driven and project-based IPE learning activity. Students report improved communication skills and theory, but the other informatics competencies lag behind. This project has provided evidence of the importance of coordinated projects between disciplines, but also room for growth in teaching informatics theory and providing opportunities for skill development.

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## INTRODUCTION

Teamwork, coordination, and professionalism have become core expectations of 21st century healthcare practitioners, students, and residents. The marketplace demands these competencies, creating the urgent need for educators to shift from focusing only on profession-specific skills, to preparing students for the realities of communicating and working together with other professions in practice.

While today's healthcare industry is composed of multidisciplinary teams working together to improve patient outcomes, in the university setting, students from different disciplines are being taught and trained separately. University class schedules, separate faculty, and physically divided departments are often to blame for the separation of students by discipline (Bachrach & Daley, 2017). It is important that all health professions students learn how to deliberately work together to foster an improved learning environment and prepare them for future positions in healthcare teams. This can be achieved through Interprofessional Education (IPE), which promotes understanding, appreciation and application of the roles, talents, and responsibilities of the members of the healthcare team. IPE is defined as "when two or more professions learn with, from, and about each other to improve collaboration and the quality of care" (About Interprofessional Practice and Education, 2017). Many innovative programs using IPE are developed using an academic/clinical partnership model. Although clinical agencies have long recognized the need for teamwork and collaboration, academic institutions have not traditionally rewarded faculty who produced their scholarship through collaborative methods. Rather, most universities stress individual teaching evaluations of one faculty for one class and research activities as solo practitioners. Nevertheless, there is a nearly universal recognition that IPE is the foundation of safe and effective patient care (Institute of Medicine, 2015). At the same time, Population Health is a growing movement that looks to move beyond measuring the cost-effectiveness and quality of healthcare in order to take a broad look at the complex issues of health and healthcare at the population level (Bachrach & Daley, 2017; Kindig & Stoddard, 2003). Population health sciences can be defined as "study of the conditions that shape distributions of health within and across populations, and of the mechanisms through which these conditions manifest as the health of individuals" (Keyes & Galea, 2016a, 2016b). The use of interdisciplinary teams is necessary to bring together the expertise needed to understand and create change in the determinants of health (Bachrach & Daley, 2017). Training students in baccalaureate and master's programs is a significant step in creating a generation of professionals prepared to tackle the complexities of population health as part of interdisciplinary teams.

An important theme in the current healthcare environment is the use of information systems and technologies to improve the quality and safety of patient care. Although technology holds great promise by itself, it is not sufficient for every problem facing healthcare today. Solutions need to include wide-ranging activities. Teamwork and technology are the future and students must learn how to integrate technology into interprofessional activities to ensure success in the digital age.

## METHODS

Students participated in an IPE project that developed from a partnership between two faculty members from a mid-sized Midwestern university and a mobile health technology solutions aggregator and software development firm focused on digitizing screening workflow and automated data collection. The target audience for the project was junior- and senior-level Health Services students from two different disciplines: Health Informatics and Health Promotion.

## OBJECTIVES

The goal of this project was to illustrate how IPE activities demonstrate the importance of teamwork and increase student engagement across disciplines. There were three objectives: (a) lay the groundwork for the student IPE activity through extensive teamwork between the two faculty members to create an environment in which IPE activities could be set up and evaluated in the classroom; (b) design an IPE activity to measure and understand student comprehension of course material, readiness to conduct and collect information firsthand, and understand how the collected information relates to their coursework and real-life work situations; and (c) identify whether additional changes are needed in curricula to further support IPE in Health Services.

## ACTIVITY DESCRIPTION

### *Development of the IPE process*

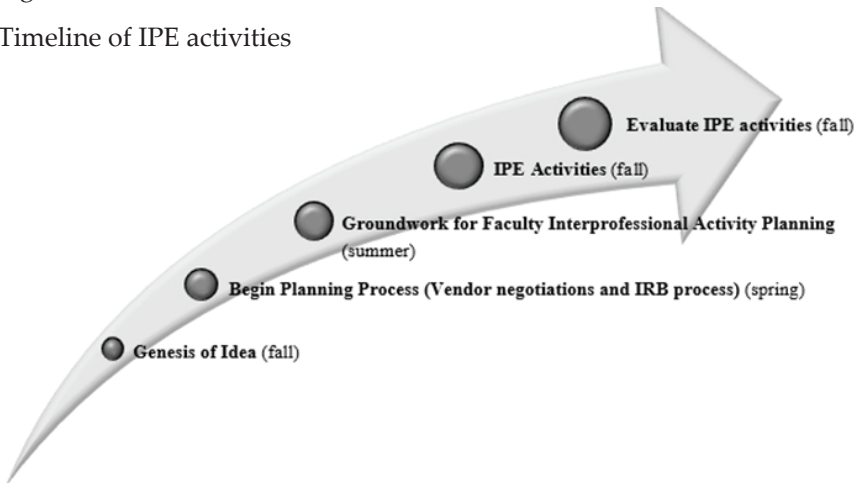
The genesis of this project came from the realization that two faculty members were attending the annual university wellness fair and conducting similar projects with their students. One class was conducting a needs assessment of wellness activities on campus via a paper survey, while the other was using technology to conduct screening and basic data collection. The faculty realized that students from separate classes could collaborate to complete a project combining both concepts – and do so more efficiently with technology. When the invitation to participate in the next annual wellness fair was

extended, the faculty decided to join forces and participate together with the intent to create an IPE opportunity for the students.

Before the start of the school year, several planning activities took place including the technology adoption, the IRB application, and the alignment of faculty course schedules (Figure 1). A major hurdle to IPE between faculty was the differences between class schedules and semester activities. The two participating faculty met to determine how to conduct joint IPE sessions with the two classes. Each of the classes met on the same days, but one met in the morning and the other in the afternoon. It was decided that the smaller class would join the larger class, with attendance at the joint session strongly encouraged – but not mandatory – for the smaller class. Class assignments were also aligned so that students were engaged throughout the semester with activities related to the wellness fair. The next step was to identify the screening and data gathering system for digitization and efficiency in population health management. Once the technology vendor was identified, negotiations started on pricing and vendor participation in student training. Negotiations for the technology and the training took several months but were successfully concluded before the start of the school year. Given that all research involving human subjects (funded or not funded) must be reviewed and approved by the University’s Institutional Review Board (IRB) before being carried out, faculty submitted an IRB necessary for the collection of community data and students’ evaluation of IPE and informatics competencies.

Figure 1

Timeline of IPE activities



### *Student activity*

Students used a full technology kit and a data-gathering system designed to enable digitization and efficiency in population health management. Students from both disciplines attended joint training sessions, with the goal of participating as student screeners at the university's annual wellness fair. First, the students worked together to develop the needs assessment to be used during the event. This gave the students an opportunity to identify priority topics on which to survey wellness fair attendees and design relevant questions to capture information related to those topics on an electronic survey. The second training session was led by the technology vendor. The students were introduced to the technology and allowed to practice collecting the biometric data and needs assessment data. The vendor was present to provide a demonstration and troubleshoot problems during the practice session. Health Informatics students were also trained on the use of an administrative dashboard to support population health trending and health data analytics. During the wellness fair, students from each class were assigned to a team so that both disciplines were represented to collect data as interprofessional teams. Each team collected data for an hour, with five teams present at any given time during the wellness fair.

### *Student evaluation*

Students were surveyed post-activity to determine whether there has been a change in their confidence in conducting screening activities as the result of IPE activities. The survey was adapted from the Readiness for Interprofessional Learning (RIPLS) Questionnaire Teamwork and Collaboration and Positive Professional Identity subscales (Parsell & Bligh, 1999; Reid, Bruce, Allstaff, & McLernon, 2006) and an adapted Informatics Competencies Required for Healthcare Professionals Questionnaire (Staggers, Gassert, & Curran, 2002). The post-test was made available following the third IPE session (the wellness fair).

Table 1

## Informatics Competencies

	Knowledge	Skills
Administration	Knowledge of computer applications for administration, e.g., Electronic Health Records, Microsoft Office, etc.	Computer skills for administrative functions, e.g., Electronic Health Records, Microsoft Office, etc.
Communication	Knowledge of computer applications for communication (e.g., email, internet, social media)	Computer skills for communication (e.g., email, internet, social media)
Data Access	Knowledge of computer applications for data access, e.g., local clinical information systems (U-Connect; hospital intranet systems)	Computer skills for data access, e.g., local clinical information systems (U-Connect; hospital intranet systems)
Documentation	Knowledge of computer applications for documentation, e.g., hospital system for documenting patient data, assessments, interventions, plan of care and discharge planning (EPIC, Health Link)	Computer skills for documentation, e.g., hospital system for documenting patient data, assessments, interventions, plan of care and discharge planning (EPIC, Health Link)
Education	Knowledge of computer applications for education, e.g., online literature searches; PDA resources; patient education (Health Facts for You)	Computer skills for education, e.g., online literature searches; PDA resources; patient education (Health Facts for You)
Screening and Patient Monitoring	Knowledge of computer applications for screening and patient monitoring, e.g., automated BP, pulse oximetry, telemetry	Computer skills for screening and patient monitoring, e.g., automated BP, pulse oximetry, telemetry

## RESULTS

*Student characteristics*

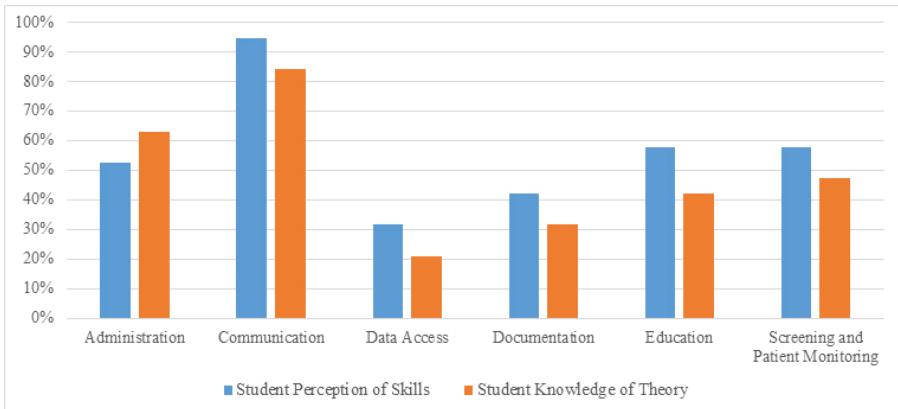
A total of 19 students participated in the post-activity survey. The mean age of the study population was 21.2 ( $SD=0.98$ ). The study population was mostly female (78.9%), which is in line with the student population within the Health Services major at the university. Informatics students were 78.9% of the sample.

*Student outcomes*

Data were analyzed to evaluate student outcomes in informatics and IPE competencies. Overall, students ranked their informatics competencies low (Figure 2), except Communication. It was expected that students’ understanding of theory would exceed their perceived skills at this point in their career, yet the students ranked their knowledge of theory lower than skills for every competency except for the Administration section. The results of the survey represent an opportunity to focus more class time on informatics theory and expertise.

Figure 2

Student Knowledge and Perception of Skills (Knowledgeable or Very Knowledgeable)

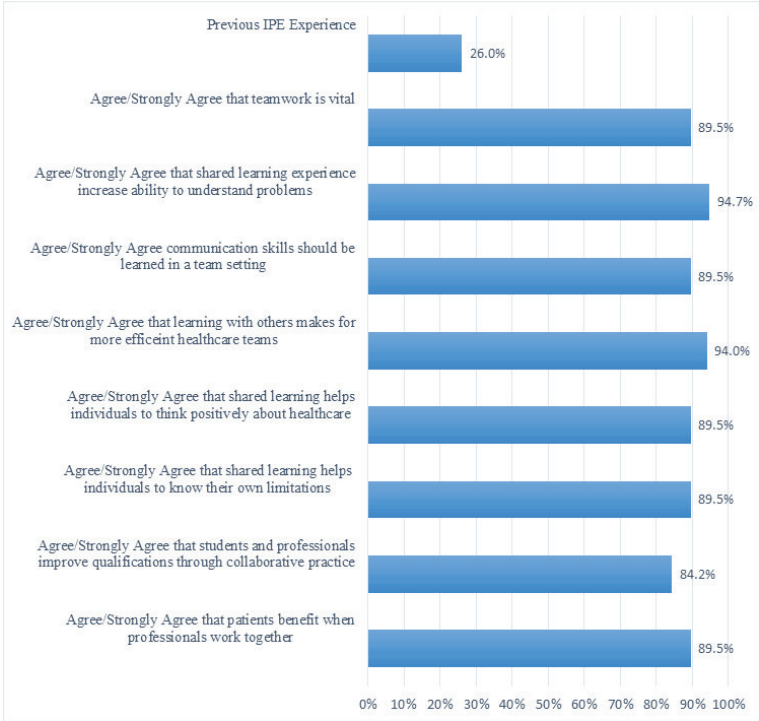


*Post-activity*

The IPE competencies are shown in Figure 3. Only 26% of the students surveyed had a previous IPE experience. Following the IPE experience of the wellness fair, students were strongly supportive of the concept that IPE improves their abilities to provide excellent healthcare.

Figure 3

IPE competencies post-activity



DISCUSSION

The goal of health professions educators is to provide students with a forum to explore the characteristics and implications of collaborative practice around one or more cross-cutting healthcare challenges while learning more about themselves as team members. This can be attained unequivocally through IPE, which involves more than merely having students from various disciplines taking classes together; it promotes understanding, appreciation, and application of the roles, talents, and responsibilities of the members of the healthcare team.

IPE is often a matter of putting the pieces together to create a whole puzzle, and planning an IPE activity can take time and effort, with compromise from those collaborating. Each piece of the project must connect to the next to achieve success. Without patience and persistence, the IPE puzzle may seem to be too



much work. This is undoubtedly one of the reasons why faculty members are reluctant to engage in such activities, the main concern being their ability to manage multiple demands and successfully progress in the promotion and tenure process. New faculty may be reluctant to transform their educational practice to incorporate interprofessional teaching methods if the promotion and tenure process do not reward such collaborative activities.

The IPE experience described herein has led to better insight regarding students' perceptions on teamwork for health assessment development, technology, data collection, and data analysis. Compared to a Danish study, our students agreed/strongly agreed to the importance of teamwork and collaboration at similar or even higher rates (Nørgaard, Draborg, & Sørensen, 2016). Students enjoyed the opportunity to work interprofessionally and were able to improve communication skills, although there remains the need to grow the informatics competencies. Nevertheless, informatics competencies have become crucial due to the increasing number of technologies present in the workforce environment. An effective health informatics professional is required to understand the relationship between information technology, people, health, and the healthcare system. They must be able to communicate efficiently with practitioners, administrators, and IT professionals, and understand the needs and restrictions of all stakeholders. The IPE competencies showed that students have a better understanding of how the interaction and contribution of other healthcare professionals can impact quality patient care.

The foundation of interprofessional education is that no one healthcare professional has the single answer to complex questions in healthcare. Every professional on the team has an essential collaborative contribution to make. Our role as educators is to nurture the next generation of professionals prepared to tackle the complexities of population health in a digital age.

The students participating in this activity had access to a vendor-developed software program to collect real-time information at the wellness fair. This activity would be possible with alternative tools (hardware and software) depending on the availability. Many types of data collection software are available at a variety of price points and will differ from university to university.

## CONCLUSION

It is important for students to participate in IPE team-based projects to broaden their own knowledge and skills, and build awareness of how the roles each member of the team can build toward the final project goal. It is also beneficial for students to work in real-life situations that show the impact their work will have on population health. Using epidemiologic tools to learn how to measure health characteristics, and interpret those outcomes and how they

might translate into public health policy to improve population health, is necessary for students who will be working in the health fields. Wellness fairs are an excellent opportunity for students to test out what they are learning in the classroom and appreciate the power of technology. Evaluating these activities is an important aspect of continual improvement of students' inter-professional and health informatics competencies via technology-driven and project-based learning activities.

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