BACKGROUND: Extensive evaluative efforts are underway to explore nuances of interprofessional education (IPE). Few studies, however, have utilized methodology that includes multiple interviews with students of various health disciplines, thereby potentially concealing factors that may be impacting students' attitudes and perceptions of IPE. By focusing on the students' perspectives, this case study explores potential barriers and facilitators to students' engagement with their IPE program.

period (typically at the end of the program, thereby eliminating opportunities to explore potential shifts in attitudes and perceptions). These approaches, although certainly yielding valuable insights, may conceal the intricacy of factors that may impact students' attitudes and perceptions of IPE.

This case study addresses these gaps by focusing specifically on a mandatory 2-year IPE program and assessing the attitudes and perceptions of students from six different health disciplines involved in the IPE program. By gathering data through one-on-one in-depth interviews from the same students at multiple points during their IPE training, and by sampling from different health professions, we intend to shed new light on students' perceptions of their IPE program and IPE in general, as well as what factors may impact students' willingness to engage in IPE program goals and aims.

Methods

Description of Study Setting

Thomas Jefferson University (TJU) was founded in 1824 as the Jefferson Medical College, now the Sidney Kimmel Medical College, and also includes the Jefferson Colleges of Biomedical Sciences, Health Professions, Nursing, Pharmacy, and Population Health. The Jefferson Center for Interprofessional Education (JCIPE) at TJU was founded in 2007 and is dedicated to improving interprofessional care. The JCIPE offers robust training programs such as the Jefferson Health Mentors Program (JHMP) to help support emerging priorities in healthcare.

The JHMP is a 2-year IPE program that is mandatory for all students entering each of the six healthcare disciplines: couple and family therapy (CFT), medicine, nursing, occupation therapy (OT), pharmacy, physical therapy (PT).

Health profession students are split into groups where all attempts are made to have each discipline represented in each group,* and each group is assigned a health mentor—an individual from the local community currently navigating the healthcare system with one or more chronic conditions. During the 2 years, groups meet two to four times each year, and the capstone of the program is a group visit to the mentor's own home to further understand the entirety of mentor's illness experience as well as expand on treatment and care options. The health mentor is the group / discussion leader and facilitator. During the meetings, health mentors guide students through their own personal health and healthcare history, as a patient and as a person.

The JHMP faculty are coaches who aid in the debriefing of the health mentor experience and represent all health disciplines at TJU. Recently, Jefferson system clinicians and students who have completed the JHMP have been co facilitating the debriefing sessions, and students seem to respond favorably to this addition. The explicit goals / objectives of the JHMP are: a) students will understand the roles of their colleagues and be prepared to function as members of effective health care teams, and b) students will understand the point of view of individuals with chronic conditions and be prepared to provide patient- and family-centered care.

Study Design & Data Collection

This case study presents an intense exploration of students' attitudes and perceptions of one IPE program. A case study is a suitable approach as this type of research explores a particular phenomenon *within its context*, often utilizing a variety of data sources.[40] Whereas the focus of the study is clearly on the perceptions of students, these perceptions cannot properly be explored without considering the *context* (where the perceptions are cultivated and applied), the IPE program (JHMP) and the health education institution itself (TJU), including the various settings in which the IPE-related meetings took place.

Participants were health profession students (who entered in 2011) enrolled in the JHMP at TJU. Twenty students were randomly selected from six health disciplines (CFT, medicine, nursing, OT, pharmacy, PT) to partake in in-depth semi-structured interviews at the end of year 1 (T1, spring 2012) and then again at the end of year 2 (T2, spring 2013) of the JHMP. A stratified random sample was selected based on the distribution of students in each discipline. Although this was achieved with medicine and nursing students, OT and PT students were slightly over-sampled, and pharmacy and CFT students were slightly under-sampled in relation to total enrollments. Students were randomly sampled by selecting every *n*th student within each disciplines enrollment roster (e.g., from the list all students enrolled in the med-

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respond to numerous interview requests. Students who declined to be interviewed cited hectic schedules and / or lack of time as their primary reasons. No student stated that they did not want to be interviewed because they disagreed with the study itself or found the questions to

offered below. Data from the interviews are presented to provide evidence for (and to elaborate on) each model. Using the categorical models as codes themselves, it was found that the JHMP must balance the a) informal and formal nature of the program, and b) "teaching" / nurturing discipline-specific role specificity and team-oriented role blurring, which is discussed below.

General Perceptions of Program

When asked what particular aspects of the JHMP they found worthwhile to their professional development and learning, participants expressed a high level of satisfaction and enjoyment in working with the health mentor, the individual living with a chronic condition who was the subject of focus during their interactions. Students felt that this was a first look at the "real world" of patient care and learned a great deal in working with this community and patient representative. Many participants also expressed how much they enjoyed the opportunity to meet with and socialize (informally) with students from other disciplines. The participants noted that JHMP provided them with rare opportunities to interact with other students and learn more about their professions. When discussing how they found these opportunities beneficial, students consistently categorized them as being informal.

> *And we had an awesome health mentor. She's a really interesting person in her own right. So we enjoyed . . . when we had these meetings, we looked forward to kind of social hour with each other and our health mentor more than anything else.* (Medical Student)

> *Our health mentor is great, she's a really awesome person. I feel like I've learned a lot from her . . . about life. And I like getting to interact with different people that I wouldn't get to interact with otherwise.* (Nursing Student)

From the students' perspective, the health mentor, as well as the opportunities to connect with students from other disciplines, represented key positive elements of the JHMP. However, participants also discussed a number of issues that they felt negatively impacted their perceptions of JHMP specifically and of IPE in general.

Prominent Factors Internal to JHMP

we just were doing different parts on a project. So we weren't really talking about the interprofessional stuff, and I don't think getting out of it what they wanted us to. (OT Student)

As noted earlier, these categorical models were then used as codes to identify broader theme(s) regarding the

ized, and the impact regarding the context, intensity, or frequency of contact between IPE students has yet to be fully dissected. Findings from this study suggest that the informal, perhaps organic, interactions are perceived by students as particularly beneficial. Similarly, participants stated that even though scheduling meetings with group members and health mentors was frustrating and often difficult, they wanted more JHMP-related meetings throughout the 2 years of the program, as well as more institution-sponsored, informal, multidiscipline social get-togethers throughout their training.

Somewhat related to these requests, participants also expressed the desire to witness and interact with professional members of their own and other disciplines in actual care delivery settings. Students felt they would learn a great deal from observing healthcare practitioners in action, which would aid in their professional identity development and the comprehension of their roles and the roles of other health professions. Although students did prioritize their own discipline-specific training and professionalization, it is clear that they were also very interested in learning more about the roles and responsibilities of other health professions.

Barriers to IPE Goals

The findings suggest that the JHMP must negotiate a delicate balance between informal opportunities for students to interact and formal elements requiring students to engage with each other. Furthermore, the students' accounts highlight the difficulty for the JHMP to teach students the roles of various health professions within a classroom setting. Without observing how the assorted roles actually work together, complement each other, or overlap to effectively deliver care to patients, students felt somewhat stunted in their ability to apply what they were being taught through the IPE program.

Similarly, participants discussed how their lack of professional identity and general understanding of the role(s) associated with their own profession severely hindered their ability and willingness to learn about the role(s) associated with other health professions, a key goal of IPE. This conflict is a principle topic within the ongoing "when to offer IPE" debate. Within this particular literature, some argue that IPE should come early in students' training before students are too locked into the specific perceptions, discourse, values, norms, and general culture associated with their future profession.[45–48] A primary concern of this IPE-early camp is that siloed learning and discipline-specific socialization and professionalization can create and sustain barriers between disciplines that can lead to distrust and disrespect and thus negatively impact students' willingness to learn and understand the roles of other occupations.[12,48–50] Proponents of this perspective appear to suggest that students can and will simultaneously learn and internalize the various intricacies related to their occupation-specific roles as well as learn, understand, and respect the roles associated with other occupations and how these roles coincide with their own.

Counter-arguments of the IPE-early perspective question how students can be expected to learn and respect the roles of other health professions, or learn how their own future profession can work with other professions, when they have yet to be exposed to the roles associated with their own future profession.[51,52] Those who advocate for security in ones' own profession-specific roles before being exposed to IPE and team-based teachings argue that students need to gain at least a fundamental comprehension of the expectations associated with the roles of their profession.[53,54] From this perspective, only students who come to IPE after participating in their profession in action can share with students from other disciplines what their profession brings to care delivery, where it may intersect with other professions, and feel confident and therefore open to understanding and respecting professions other than their own.

The "when to offer IPE" dispute reflects not only the struggle students feel in attempting to cultivate and adopt both uni-professional and inter-professional identities, but also spotlights the power of discipline-specific, siloed learning and socialization, along with the influence and command of anticipatory socialization, the attitudes and stereotypes students bring with them when they enter their training. Shields[55] referred to anticipatory socialization as "prior knowledge of cultural aspects of colleges and universities and the student role" and suggested that not only parental and sibling experiences, but also the student's own life experiences before starting college, could have an impact on preparing them for university life.

Although Shields was examining the influence of anticipatory socialization among university students, it is not difficult to see how anticipatory socialization could affect health profession students entering their training, especially in terms of how they view other health professions.[20] The role and impact of anticipatory socialization are evident in the students' accounts presented in this specific study. Participants explicitly acknowledged that they came to their training with ideas and beliefs regarding the care delivery capabilities and levels of health knowledge associated with their own and other health professions, and that these stereotypes were reinforced and perpetuated in the school/training setting. These preconceived notions and buttressed stereotypes hinder if and how students interact with one another as well as their willingness to engage with IPE goals. In this sense, IPE programs face an enduring battle to dispel negative stereotypes and

encourage respect and understanding of other health professions, addressing negative perceptions held by entering students but also constantly counteracting uni-professional ideologies and stereotypes.

Those factors that were categorized as external to the JHMP (i.e., *identity formation* and *anticipatory socialization*) clearly impact students' perceptions of their IPE program and, in turn, their willingness to engage with IPE. *Identity formation* and *anticipatory socialization* are indeed challenging factors for IPE faculty and administrators to address and/or attempt to control. Aside from influencing how their own and other health professions are presented and perceived at the societal level, there is very little IPE faculty and staff can do to curtail or curb if and how incoming students "learn" about health professions. Furthermore, given the ongoing "when to offer IPE" debate, it would appear that there is not an ideal time to offer IPE so that students are guaranteed to assume both a uni- and inter-professional identity. Therefore, perhaps it would be more fruitful and effective for IPE developers to address the more internal factors spotlighted in this study.

Participants offered their frustrations with the lack of accountability associated with JHMP, specifically in regards to grading, feedback, and the general method of performance evaluation. The perceived lack of a more formal structure of assessment left the students unwilling to spend much time or energy on their IPE assignments, exasperated with IPE-related tasks, and apathetic toward program-related goals. This suggests that enhancing student "buy-in" regarding IPE may be a worthwhile and effective means of altering students' attitudes toward their IPE program and instilling IPE goals and aims. This could be done through more formal evaluation techniques, such implementing a letter-grade basis for assessment, providing extensive and constructive feedback on IPE-related assignments, and even testing on IPE-related material. Heightening the "seriousness" of the program, the impact the program would have on students' academic progress and standing, and the faculty presence may positively impact students' attitudes toward the IPE program and, in turn, amplify their willingness to engage with IPE goals.

Testing on material improves learning and retention of that particular material; this is the fundamental axiom of the Testing Effect.[56] ''The direct effect of testing is based on research showing that when students are tested on material, they remember that material much better than when they are not tested on the material. This is called the testing effect."[57] Many educators and researchers attest to the notion that testing on subject matter motivates students to learn that material.[58,59] The testing effect supports the popular belief that assessment drives learning. Health profession students are formally tested on a wide range of concepts and principles such as microbiology, immunology, pathology, pathophysiology, anatomy, and others throughout their training to promote subsequent learning of these materials for their qualifying exams. From this perspective, it is recommended that IPE programs interested in cultivating and enhancing interprofessional qualities and attributes among their students increase the frequency of formal examinations of aspects of other health professions as well as tenets associated with interprofessional collaboration and team-based care. Although students could be tested on a variety of material related to other health professions (e.g., history of the profession, tasks and responsibilities related to delivery of care, etc.), it is understood that interprofessional team-based care, like "empathy" and "professionalism," is more of something you exhibit, rather than something you can recite for an exam.

In this sense, interprofessional team-based care could be tested through various standardized patient exercises for IPE students and having these exercises/tests formally graded in the areas of communication, interpersonally connectivity, and other IPC-related skills. Standardized patient exercises are considered effective ways to evaluate and educate medical students' history-taking and physical exam skills,[60] but researchers also argue that these simulations provide valuable opportunities for educators to assess students' humanistic attitudes[61] as well as degree of empathy[62] toward their patient. Previous research has shown the value in utilizing simulated patient, and simulated team, exercises within IPE programs,[63,64] but there has been minimal discussion on if/how these simulated patient exercises specific to IPE are evaluated or formally graded.

Frequent formally graded standardized patient exercises for IPE groups that are woven throughout the IPE program may also, to some extent, appease students' desire for more interactions with students of other health disciplines and more "real life" experiences in care delivery. Although standardized patients are certainly not "real life," it does provide students opportunities to engage in IPE and interprofessional collaboration goals and aims in a care delivery setting of sorts, allowing them to practice their professional roles and learn more about the roles of other health professions in action. In turn, such experiences could also promote professional identity and inter-professional identity formation.

A number of the findings from this study echo those from previous qualitatively-oriented research on students' attitudes and perceptions to their IPE program and IPE in general. In their examination of students' perceptions of an IPE event, Rosenfield, Oandasan, and Reeves[25] found that although students had generally positive perceptions of IPE, they had negative perceptions regarding particular aspects of their IPE program, notably the size of the event and the fashion/manner in which interprofessonalism and team-based

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