



Student readiness for interprofessional learning at a local university in South Africa

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ABSTRACT

Working effectively with other disciplines has become an important competency as a graduate attribute in higher education institutions. Educational experiences should begin to foster the prerequisite competencies needed to collaborate successfully with other healthcare professionals. The purpose of this study was to determine how ready first year students are for interprofessional learning, and whether this readiness improves along the continuum of learning into their final year of undergraduate studies. First year undergraduate students from ten disciplines completed the Readiness for Interprofessional Learning Scale prior to participating in a compulsory interprofessional module, and the results were compared with that of senior students who completed the same questionnaire. Results for the study show that there were significant differences between first and senior-year level students on the subscales of negative professional identity ($0.02 < 0.05$); positive professional identity ($0.00 < 0.05$); and teamwork and collaboration ($0.00 < 0.05$). There was no significant difference found on the subscale roles and responsibilities ($0.54 > 0.05$). The results clearly show that senior students are more ready for learning interprofessionally compared to first year students. It is recommended that a scaffolded approach to learning be adopted, to ensure that students attain competence in all Interprofessional Education (IPE) core competencies when reaching their final year of study. This type of curriculum, with its specific activities and assessment methods, should be packaged in the form of an IPE model to create a clear understanding of the type of health profession graduate that will be produced.

1. Introduction

Interprofessional education and practice is key to health professions education, and has become the basis for the restructuring of the curricula of various health professions education programs. Interprofessional Education is defined by the Centre for the Advancement for Interprofessional Education (CAIPE, 2016, para. 1) as “occasions when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services”, which will be used in the context of this article.

Qualitative research studies have featured the significance of interprofessional practice and education (Furness et al., 2012; Honan et al., 2015), and based on the core competencies of interprofessional practice, research has highlighted how important enhancing these competencies can be in contributing to the improvement of patient outcomes (Puntillo and McAdam, 2006). Thistlethwaite (2012) states that part of the

motivation for an IPE approach during tertiary education is to prepare students to be able to work with other professionals, to understand roles within their respective health systems, and to be grounded in team-based care delivery before they graduate, rather than expecting them to steer through this complexity once they are clinicians.

According to Furness et al. (2012), improving communication and the understanding of professional roles amongst health professionals can result in fewer errors in patient care. The authors further highlight that positive team experiences can minimise destructive stereotyping, facilitate understanding of roles and responsibilities, and increase confidence in one's own ability to function as a team member. Traditionally there appears to be an implied expectation that health professional students will automatically work together successfully as team members once they are part of the workforce. If the expectation of students is to learn about teamwork and professional roles, and to be prepared for collaborative practice, it would appear both logically and educationally

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compulsory, that teamwork is included in health professional curricula, and also to explore critically the most effective method of delivering learning activities to promote future collaboration (Thistlethwaite, 2012). Consequently the need to integrate IPE into training curricula has become widely accepted by Higher Education Institutions (HEIs). However, currently the prospects for learning with and about other healthcare professions is absent in many HEIs training programmes, and the integration of effective IPE into curricula has much room for improvement (Greer et al., 2014). Although we understand the importance of interprofessional education in driving health professions education, and the value it provides when students learn with, from and about each others' professions, the successful implementation of such programmes is dependent on the key stakeholders, namely the students, being ready to engage. In a study by Lestari et al. (2016), it was reported that medical students in Indonesia did not want to share knowledge with other health professionals and thus opposed the concept of IPE. However, Al-Eisa et al. (2016) indicated in their study the readiness of undergraduate healthcare students for IPE, and emphasised the need to implement shared learning. In a study conducted in the United States of America, it was found that, although healthcare professional students demonstrated a readiness for interprofessional learning, there were differences in the baseline readiness of the students, and this could influence the implementation of programmes (Talwalkar et al., 2016). All of these recent studies indicate the need to identify student-readiness for interprofessional education, as it could influence the programmes and activities designed (Al-Eisa et al., 2016; Lestari et al., 2016; Talwalkar et al., 2016).

This study differs from previous studies as it aims to assess students in their first year of study, prior to exposure to interprofessional learning opportunities in their course of study, as well as final year students who have been exposed to interprofessional learning opportunities (Ethics Registration no: 14/9/25). The adapted RIPLS excluded elements around patient centredness as this study did not require interaction with live patients/clients but rather focus on the IPE curriculum at a tertiary level. Furthermore, first year students would not have had contact with patients/clients during their first year of study. Coster et al. (2008) supports the idea that IPE should be introduced from the start of the students' professional education to take advantage of students' readiness for interprofessional learning and professional identities.

2. Methodology

2.1. Context of IPE at the University of the Western Cape (UWC)

Teaching modules in the Faculty of Community and Health Sciences (FCHS) at UWC, as well as in other health sciences faculties, have a tendency to be discipline specific, and therefore taught in isolation from other related departments. This has resulted in health professionals having little knowledge of the role of other disciplines. More than two decades ago, UWC made a conscious decision to identify interprofessional modules that health professionals could take, and has been building on this over the years. It therefore became essential for different professionals to understand what each team member could do, so that they could work together effectively. This led to the introduction of first-year interprofessional modules, which aimed at providing students with a solid foundation in the interprofessional approach. All students entering the FCHS and Dentistry Faculty undertook common first-year courses that highlighted interprofessionalism. The first-year courses equip students for active roles as members of the health team. As students move into the more discipline-focused years of training, their interprofessional community-based practice experience becomes one of sharing sites for interprofessional team activities. The emphasis and philosophy of the community-based learning process at all year levels, including at secondary and tertiary levels, is rooted in the Primary Health Care Approach. These courses have been planned jointly by staff from a number of health and welfare-related departments at UWC in the

FCHS and Dentistry Faculty. The courses are compulsory for all health science students, and serve as a foundation for all other interprofessional courses which are offered in the second, third and fourth year of training (Filies and Waggie, 2016).

2.2. Study population and sample

The study population consisted of first and senior year level students registered for the 2015 and 2016 academic years. The study included all first-year students registered for a Primary Health Care module from the disciplines of Dentistry, Dietetics, Natural Medicine, Nursing, Occupational Therapy, Oral Health, Pharmacy, Physiotherapy, Social Work and Sports Sciences. The total population of first year students was 798. Disciplines pursued by the senior students included Nursing, Occupational Therapy, Pharmacy, Physiotherapy, Social Work and Sports Sciences.

Although all first-year students enrolled for the Primary Health Care module were approached to participate in the study, they were not forced to participate in the study and were ensured that there would be no negative consequences should they choose not to participate. Students were not required to enter their names or student numbers on the forms to ensure their anonymity in the study. Each form was assigned a participant number for the researcher to keep track of the data while entering it into the database for analysis purposes. The researcher negotiated with individual departments to access the senior students who were also ensured of anonymity should they volunteer to participate in the study. The students were given time at the end of their lectures to participate in the study and those who chose not to participate could leave the classroom. This ensured voluntary participation in the study.

Convenient sampling was used for students participating in the study, resulting in 295 first year students and 281 senior students completing the questionnaire, and thus comprising the study sample of 576. The response rate for first year students was 37% (74% females and 26% males), while the response rate for senior students was 100% (71% females and 29% males).

2.3. Design

A quantitative survey design was used for this study. It is a method for quickly gaining some general details about one's population of interest to help prepare for a more focused, in-depth study (Aliaga and Gunderson, 2002).

2.4. Data collection tools

A 15-item Likert scale, Readiness for Interprofessional Learning Scale (RIPLS) adapted from Parsell and Bligh (1999) was used in this study to assess attitudes towards interprofessional education (Curran et al., 2008). Reid et al. (2006) has confirmed validity and reliability of the research instrument (RIPLS) which was ensured through scrutiny and testing by an interprofessional group of health care experts. Components of the questionnaire include teamwork and collaboration, professional identity and roles and responsibilities which were better suited to first year students. The original RIPLS (Parsell and Bligh, 1999) included a patient-centredness component in the questionnaire was not applicable to first-year students and therefore the adapted version of RIPLS was used.

2.5. Data collection process

The research instrument was piloted with one of the 13 classes participating in the interprofessional module. The pilot study was necessary as the researcher needed to ascertain whether the students understood the statements in the RIPLS, and if they could rank the statements accordingly using the given Likert scale. During the pilot

study it was found that students had minor difficulty with the negatively loaded statements, but with some explanation by the researcher, the students were able to complete the survey. The researcher also found that it was important to stress to students that they complete the demographic section of the survey, as some of the students skipped parts of this section, which would make it difficult during the analysis of the survey. With some explanation before administering the survey, these two issues were resolved. Since there were no other major difficulties encountered during the pilot study, and because no changes were further necessary to the questionnaire itself, these questionnaires were included in the main study.

The researcher met with all facilitators of the interprofessional module during their weekly meeting, to explain the nature of the research study and to request a timeslot during their next class to administer the survey questionnaire to all students. Facilitators also then had the opportunity to discuss or ask questions about the research study. Following the training session, information sheets, consent forms and survey sheets were given to all the facilitators, in order for them to administer the forms in their next class. In addition, the researcher explained the study and the need for participation to the module coordinator, departmental representatives and heads of department beforehand. The questionnaires were then administered during the next interprofessional class by those facilitators who were trained in the administration of the survey. The researcher was available during this process in the event of any queries or problems which might arise.

2.6. Analysis

Data from the RIPLS was captured and analysed by Statistical Package for the Social Sciences (SPSS) software. The RIPLS questionnaire in this research study was further analysed by exploratory and inferential data analyses. Within exploratory data analysis descriptive statistics was included to further clarify the findings. With regards to inferential analysis of the RIPLS questionnaire, the *t*-test was used, which is appropriate as it compares the means of two sample groups, in this case, first year and senior-level student groups.

3. Results

3.1. Demographic information

The mean age of the students in the first year group was 21.22 years while the mean age for the senior students was 23.46 years. The gender composition was unequal, with female students comprising 74% ($n = 216$) and male students 26% ($n = 74$) of the first-year student sample group. The senior student population comprised 71% ($n = 198$) female students and 29% ($n = 83$) male students.

3.2. Results of the Readiness for Interprofessional Learning Survey (RIPLS)

Two variables were used to determine significance in the RIPL survey, namely gender and disciplines. Readiness for interprofessional learning scores indicated that students were definitely more responsive at the senior level, as compared to the first-year level. RIPLS scores were statistically greater in senior male students ($F = 1.74, p = 0.01$) for the subscale of teamwork and collaboration, indicating more readiness for shared learning. For senior female students there was statistical significance in the subscales of positive professional identity ($F = 0.002, p = 0.02$) and teamwork and collaboration ($F = 0.006, p = 0.02$). [Table 1](#) below indicates that both student groups understood the importance of developing a positive professional identity within the context of a team approach to health care. No significant impact was noted for the subscales of negative professional identity and roles and responsibilities with regard to gender differences from first to senior-level students.

With regard to significant differences in specific disciplines from first

Table 1
RIPL subscales and scores.

Teamwork and collaboration					
Participants	N	Minimum	Maximum	Mean	Std. deviation
First year level	287	2.33	5.00	4.3546	0.41907
Senior year level	277	2.89	5.00	4.5086	0.39281
Negative and positive professional identity					
Negative first- year level identity	288	1.00	5.00	3.8472	0.74497
Positive first year level identity	290	1.00	5.00	3.9460	0.65778
Negative senior year level identity	280	1.00	5.00	3.9952	0.73322
Positive senior year level identity	277	2.00	5.00	4.1432	0.61968
Roles and responsibilities					
First year level	287	1.00	4.67	3.1626	0.56432
Senior year level	281	1.33	5.00	3.1922	0.58507

to senior-level students, scores again indicated that students were more ready at a senior-level for interprofessional learning. RIPL scores indicated no significant differences between first and senior students in the following disciplines: Dietetics, Occupational Therapy, Pharmacy, Physiotherapy, Social Work, Dentistry, Oral Health, Natural Medicine and Sports Sciences. The only significant difference was noted in the Nursing discipline for the subscale of teamwork and collaboration ($F = 2.812, p = 0.003$).

When comparing significance between first and senior-level students, it is useful to refer to [Table 2](#) below. For negative professional identity, the hypothesis was rejected, and it can be concluded that there is a significant difference between first and senior-year level students ($0.02 < 0.05$). The hypothesis for positive professional identity was rejected, and it can be concluded that there is a significant difference between first and senior-year level students ($0.00 < 0.05$). With regard to teamwork and collaboration, the hypothesis was rejected, and it can be concluded that there is a significant difference between first and senior-year level students ($0.00 < 0.05$). In the last category, roles and responsibilities, the hypothesis was not rejected, which indicates no significant difference between first and senior-year level students ($0.54 > 0.05$). The results show that senior students are more ready for learning interprofessionally compared to first year students.

4. Discussion

Based on the findings of this study, various key results emerged, which focused on a willingness to collaborate, the year level, and the influence of gender and exposure to IPE activities. Findings from the current study showed that the students valued collaborative learning with other healthcare professional students, as well as sharing experiences with them. Numerous studies have observed that health science students are inclined to report positive attitudes towards interprofessional education in general ([Pollard et al., 2004](#); [Tunstall-Pedoe et al., 2003](#)). There are many definitions of the term 'attitude', but in general it is defined by [Muslim et al. \(2020\)](#): 2) as "the tendency of the mind to act in a certain way based on experience and behaviour". It is usually understood that an attitude includes three distinct components: cognitive, affective and behavioural ([Svenningsson et al., 2021](#)). This is important to know in curriculum development, because cognitively students learn, read, see and hear about the positive aspects and importance of interprofessional collaboration (IPC) during related courses. Furthermore, they experience IPE and IPC in a manner that results in a positive affect through a process whereby students collaborate interprofessionally on a task that allows them to experience positive emotions. Although studies suggest that this positive attitude towards IPE diminishes over time, early IPE experiences can have a positive impact on students'

Table 2

Comparison of readiness for interprofessional learning from first year students and senior level students.

Scales	Total sample		First year students		Senior students		t	p
	Mean	SD	Mean	SD	Mean	SD		
Negative professional identity	3.920	0.742	3.847	0.745	3.995	0.733	-2.386	0.017
Positive professional identity	4.042	0.646	3.946	0.658	4.143	0.620	-3.676	0.000
Teamwork and collaboration	4.430	0.413	4.355	0.419	4.509	0.393	-4.504	0.000
Roles and responsibilities	3.177	0.574	3.163	0.564	3.192	0.585	-0.613	0.540

willingness to continue learning together throughout their professional training (Anderson and Thorpe, 2008; Horsburgh et al., 2001). It is therefore important when designing IPE curricula to include a range of teaching and learning activities along the continuum of learning, so as to maintain this positive attitude towards IPE. Studies indicate that students whose undergraduate training included an interprofessional curriculum, tended to be more confident as graduates about their skills in communication, interprofessional relationships and professional engagement with others (Anderson and Thorpe, 2008). Considering the significance of attitudes towards learning and the resulting behaviours, critical learning outcomes should be geared towards the understanding of student perceptions and attitudes regarding interprofessional learning, teamwork and collaboration with other health professionals (Pollard et al., 2004). Therefore, when designing the interprofessional model, a baseline needs to be established whereby measuring points are clearly determined for each IPE programme at all year levels.

Another significant subgroup finding was the relationship between the students' year level and all subscales in RIPLS. Senior students scored higher than the younger students, meaning that they agreed more often with items in the survey, stressing the values of teamwork and collaboration, professional identity, and roles and responsibilities. This indicates that students had become more ready for IPE learning from their first year of study progressively into their senior years. Al-Eisa et al. (2016) claims that the difference between the two student groups could be due to senior students having had the experience of health-care services and having learned about interprofessional work during clinical practice, unlike first-year students. There is an expectation that first year students would have no background knowledge or readiness towards IPE. Curran et al. (2008) state that health professional students should be exposed to positive role modelling throughout their education, which in turn develops values for interprofessional collaboration. For curriculum development, exposure and immersion in experiences and practice placements that promote these values should be included throughout the learning continuum. Another mechanism is to incorporate in the development of an IPE model the creation of opportunities whereby senior students can interact with junior students, through various activities that will allow them to share experiences, and hopefully become positive role models. Interprofessional collaboration is touted as a significant strategy for improving and renewing health systems, and, as such, it has become critical for students to develop competencies which will enable them to become highly effective team members (Curran et al., 2008). Furthermore, since first year students are still developing a professional identity, it would possibly make sense to focus on generic teamwork competencies without consideration of the different roles of each professional group (Horsburgh et al., 2001). Weller et al. (2014) supports this initial focus on teamwork, and reports that barriers to teamwork include a lack of knowledge about the roles and perspectives of different health professionals. Horsburgh et al. (2001), on the other hand, state that literature is not clear on when the introduction to different professional roles would be most useful. El-Awaisi et al. (2016) provides guidance by stating that the learning should fit with the students' capacity and stage of learning to permit students to develop a sense of their own professional identity, as well as an understanding of what it means to be a competent collaborator.

Gender seemed to influence the scores in this study, with females valuing professional identity, teamwork and collaboration. Many

studies have found that females tend to have a more positive attitude to interprofessional learning than their male counterparts. Coster et al. (2008) suggest that the differences in learning styles between the genders can be explained through females being more receptive to IPE. In particular, women tend to accentuate listening, understanding and trusting the views of others while learning. This should be viewed as a positive aspect during curriculum design and, although it is a global phenomenon, that there are more female health professions students than male students, interprofessional groups should include both genders as far as possible (Coster et al., 2008). According to Karell (2017), women tend to view communication as a path to create friendships and build relationships, while men tend to communicate to negotiate for power, seek wins, avoid failure and offer advice. As far as possible, interprofessional learning groups should not be exclusively one gender. However, further study is still needed to comprehend the impact gender has on readiness for IPE and how to apply this information to the design of IPE curricula.

The final significant subgroup finding was that the discipline which had the least exposure to the current IPE activities in the faculty and had a significant lower score on the teamwork and collaboration subscale was nursing. Hertweck et al. (2012) offer an explanation for this finding by stating that these students are educated in the medical model. They further explain that some students possibly work closer with the physician who influences their opinion on the value of working with other health care professions' students in a team. In addition, Tanaka and Yokode (2005) found that medical students were significantly less positive towards IPE than other health care professions' students. In this study, a possible reason for this finding is that the nursing discipline does not form part of the second year level IPE curriculum, which impacts on the students' attainment of all core competencies, in comparison to students from other disciplines who are participating in IPE activities at each year level. This means that those students with more exposure to all the current IPE activities agreed more often with statements about the value of working with other health care students. This may indicate that students participating in all IPE activities viewed and experienced interprofessional interactions more often and had a better opportunity to attain IPE core competencies. In terms of curriculum design, it would be necessary to design additional learning opportunities for nursing students to foster a more positive attitude to teamwork and collaboration. It is also important for the nursing students to participate in all IPE activities under the guidance of the IPE model suggested in this study.

Hertweck et al. (2012) state that the RIPLS scale seems to measure attitudes rather than behaviour, and is by no means a measure of interprofessional practice, and thus determining the effect of a long-term interprofessional curriculum on both attitudes and behaviours could be advantageous. The findings from this study have provided evidence that, over time, students' readiness for learning interprofessionally increases with regard to professional identity, teamwork and collaboration. The research findings showed no significance with regard to roles and responsibilities in both student groups. There was a consistency across three subscales for the two groups of students, in that they recognise the benefits of shared learning and that the attainment of team-working skills is beneficial in becoming health professionals. Furthermore both groups also felt it could be beneficial to patient care and possibly could enhance working relationships.

5. Conclusion

It is evident from the analysis above that four key findings emerged and that these included the influence of gender, year level, exposure to IPE activities, and willingness to collaborate. It is important to note that interprofessional learning, and the learning outcomes to be achieved at any stage of a curriculum, are factors that need to be considered when designing an IPE model. The scaffolding approach (Frantz and Rhoda, 2017) to interprofessional learning is therefore a vital consideration in determining the correct timing to learn about the different professional roles. Other authors agree and advise that learning experiences about different professional roles can be structured along an IPE continuum of exposure, immersion and mastery (El-Awaisi et al., 2016).

Although undergraduate interprofessional learning is qualitatively different to postgraduate level, opportunities can be created for undergraduate students to consider the various professional roles. This can be done through small-group work or problem-based case studies with an interprofessional focus during curriculum design. Based on the findings of this study, it is therefore essential that academics in the FCHS have a broad understanding of the IPE curriculum, as students will attain different competencies at each year-level aligned to specific content. This scaffolded approach to learning cannot be left to chance, and needs careful design to ensure that students attain competence in all IPE core competencies when reaching their final year of study. These competencies need to be aligned to the appropriate selection of activities that will demonstrate the level of competence which needs to be assessed through suitable methods. This type of curriculum, with its specific activities and assessment methods, should be packaged in the form of an IPE model, to create a clear understanding of the type of health profession graduate that will be produced.

6. Implications for practice

IPE has long been suggested as a way to meet the demand for effective collaboration in practice, with a view to improving health outcomes for patients/clients/families/communities. To optimise the health professions' contribution to healthcare, a more strategic approach is required in partnership with education, along with research into the effectiveness of IPE. The findings of this study fill the gap in the literature by identifying the potential for interprofessional collaboration, through preparing graduates adequately to work interprofessionally. It provides important evidence for health educators and health professional policy makers to understand how interprofessional education and collaboration results in a more comprehensive approach to improving health outcomes, which in turn can inform national and regional policy and practice.

7. Limitations

The aim of this study was to determine how ready first-year students were for interprofessional learning, and whether this readiness improves along the continuum of learning into their final year of undergraduate studies. A major limitation of the study was to track this readiness along the continuum of learning in order to identify the learning and teaching activities that contribute towards this readiness for IPE. Future studies could look at these activities from first-year to final-year of studies and identify the IPE core competencies that are instilled in students to make them ready for collaborative practice as future health professionals.

CRedit authorship contribution statement

Gérard Filies and José Frantz: Conceptualization Ideas, Methodology, Validation, Formal analysis, investigation, resources, Data Curation, Writing - Original Draft, Visualization. **José Frantz:** Supervision. **Gérard Filies:** Project administration

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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