

**Development of an Interprofessional Education Model that Aims to Instil
the Core Competencies of Interprofessional Collaborative Practice in
Allied Health Students Curriculum**

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Supervisor:

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“Knowing is not enough, we must apply. Willing is not enough, we must do.”

(Goethe)



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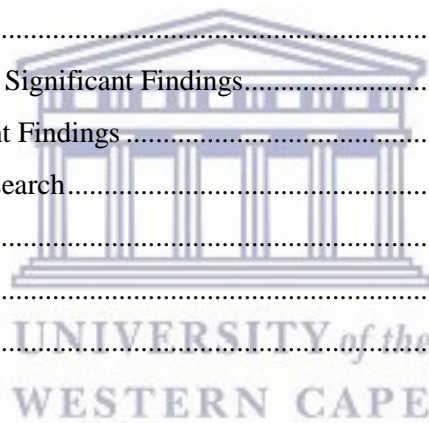
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Abstract

Health Professions Education has not prepared graduates to address the health challenges of the twenty first century, largely due to fragmented, outdated and static curricula. Interprofessional education (IPE) is a leading approach to facilitate student learning for future interprofessional teams in addressing the complex health needs of the community. To achieve this outcome, different core competencies need to be developed, including 1) interprofessional communication; 2) patient/client/family/community-centred care; 3) role clarification; 4) team functioning; 5) collaborative leadership and 6) interprofessional conflict resolution. This study aims to design an interprofessional education model that endeavours to instil the core competencies of interprofessional collaborative practice in allied health students. This study makes use of a mixed methods approach and included a systematic review; a readiness for interprofessional education survey; a Delphi study; curriculum mapping and model design aspects.. The data collection methods used included both quantitative and qualitative methods. The study population for the implementation phase incorporates students from the disciplines of Nursing, Physiotherapy, Occupational Therapy, Natural Medicine and Social Work registered for the 2015/2016 academic year. The methodological framework for this study was Designed Based Research (DBR).

Major findings in the research study are: the systematic review revealed that there are no South African studies currently in the literature that provide evidence of IPE core competency development in curriculum design; findings in this research reveal that the readiness for interprofessional learning increases along the continuum of learning at UWC and that the curriculum must be scaffolded and strengthened to further develop competencies; the preferred activities that are common across all the core competencies are case studies, joint clinical placements, simulations, role plays and workshops/discussions; the preferred assessments for each of the above activities that related to each of the core competencies are portfolios, reflection and the use of rubrics; and there appear to be similarities between graduate attributes and IPE core competencies, but much-needed further discussions are also required to discuss the items where no similarities are found.

Embedding competencies along the continuum of learning with appropriate activities and assessment methods is a step in the right direction towards producing T-shaped graduates that are able to work collaboratively to solve complex problems. An important limitation of this thesis is that it presents only the design of the IPE model and not the implementation and

evaluation aspects of the study. In general, it is recommended that the barriers to full participation encountered by all departments be addressed in terms of administrative support, programme infrastructure, attraction of committed and experienced staff, and that all student efforts should be acknowledged. While the model is not new, it has expanded existing theoretical frameworks to provide a structure for new and existing activities in the Faculty of Community and Health Sciences.



Keywords

Interprofessional education

Interprofessional collaborative practice

Core competencies

Interprofessional teamwork

Interprofessional roles and responsibilities

Interprofessional communication

Teams and teamwork



Declaration

I declare that developing an interprofessional education model that aims to instil the core competencies of interprofessional collaborative practice in allied health students is my own work, that it has not been submitted for any degree or examination to any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Name: Gérard Charl Filies

Date: December 2017

Signed: 

Prof. J Frantz (Supervisor)



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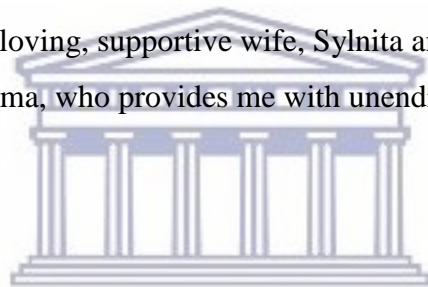
To Victoria for always standing to help and making our lives a little easier everyday. To Aunty Koewa, thank you for watching us over from above and being a guardian angel, you are deeply missed.

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Dedication

I dedicate this thesis to my loving, supportive wife, Sylvania and two wonderful children, Arian and Gemma, who provides me with unending inspiration.



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Abbreviations

AfriMEDS	African Medical Education Directions for Specialists
AfriPEN	African Interprofessional Education Network
CIHC	Canadian Interprofessional Health Collaborative
CP	Collaborative Practice
DBR	Design Based Research
FCHS	Faculty of Community and Health Sciences
GAs	Graduate Attributes
GCs	Generic Competencies
HEIs	Higher Education Institutions
HPCSA	Health Professions Council of South Africa
HPE	Health Professions Education
ICF	International Classification of Functioning, Disability and Health
IECEP	Interprofessional Education Collaborative Expert Panel
IPCP	Interprofessional Collaborative Practice
IPE	Interprofessional Education
IPEC	Interprofessional Education and Collaboration
IPEU	Interprofessional Education Unit
IPL	Interprofessional Learning
RIPLS	Readiness for Interprofessional Learning Survey
UWC	University of the Western Cape
WHO	World Health Organization

CHAPTER 1

1 BACKGROUND TO AND ORIENTATION OF THE RESEARCH

1.1 Introduction

In the first chapter of this study the background supporting the need for the study is outlined. It highlights the processes undertaken in developing an interprofessional education model that aims to instil the core competencies of interprofessional collaborative practice in allied health students. The overall aim of the study is given and the specific objectives are outlined. The significance of the study is the development of an interprofessional education model that could guide the Faculty of Community and Health Sciences (FCHS) to deliver successful IPE curricula for all students. Finally, the terms of reference are highlighted in this thesis and outlined at the start of each chapter.

In order to outline the context of this research study, the following sections will be elaborated on; defining the terminology of the study, followed by the shift in health professions' education to an interprofessional approach are discussed to highlight the importance of interprofessional education (IPE) and practice. After this anticipated shift in health professions' education is made, the next subsection unpacks the development of an IPE model within Higher Education. In order to understand how IPE was implemented at various institutions, the next two subsections highlight the Global Forum Partnership Initiative and the African Interprofessional Education Network as initiatives in this regard. Lastly, the development of IPE core competencies will be discussed in this chapter and will be linked to the research setting, the FCHS.

1.2 Defining Interprofessional Education, Learning and Practice

Students usually start their undergraduate training with prior labels of their own professional identity and stereotypes of others (Tunstall-Pedoe, Rink & Hilton, 2003). Educators/mentors, who serve as role models to these students (Gill & Ling, 1995; Parsell & Bligh, 1998; Waugaman, 1994), can often shape this assumed identity. The professional views and attitudes of educators with respect to collaborative practice thus play a critical role in student training. Students, in turn, also influence educators, and in this way, a mutual association can take

place over time and across age groups. D'Amour and Oandasan (2005) indicate that educators can either be enablers or barriers to students' opportunities to gain collaborative competencies.

Over the years IPE curricula has gained popularity through outcomes-led curricula. This outcomes-led curricula often has itemised collaborative competences (Barr 1998) and has proved helpful in aligning professional and interprofessional objectives where the professional programmes are also competency-based. Competence or capability-based outcomes help in setting provisional objectives for undergraduate training in IPE. Preparedness for interprofessional practice should be followed up in a collaborative environment, which includes clinical practice or fieldwork settings where interprofessional learning can occur.

Interprofessional Education (IPE) is most commonly used by universities when referring to undergraduate training and achieving graduate attributes in those completing their degrees (Stone, 2009). IPE can best be defined as "Interprofessional education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care" (Centre for the Advancement of Interprofessional Education, CAIPE, 2002). This definition by CAIPE is applicable to both students and qualified health professionals working in the field. The term "professional" includes support workers or assistants such as allied health and nursing assistants.

It can however also be incorporated into teaching and learning opportunities for qualified health professionals in the field as part of interprofessional learning (IPL). IPL is a "philosophical standpoint that embraces adult learning principles, life-long learning and a continuous learning process between various health care professionals and cultures" (Mulholland, Barnett & Spencer, 2014, p. 2). IPE is thus a leading approach to facilitate student learning for future interprofessional teams in addressing the complex health needs of the community. Students familiar with this approach as part of their education are more likely to become collaborative interprofessional team members who show respect and positive attitudes towards fellow colleagues (Bridges, Davidson, Odegard, Maki & Tomkowiak, 2011).

Stone (1999) explains that the World Health Organisation (WHO) approves of the term Interprofessional Collaborative Practice (IPCP), as a concept which includes the preferred behaviour resulting from IPE and IPL. IPCP therefore refers to the exchanges between various disciplines in a team (Atwal & Caldwell, 2006).

IPE can therefore, be seen as developing a continuum of learning together with the ultimate progression towards collaborative practice.

1.3 The Shift in Health Professions' Education to Interprofessional Education and Practice

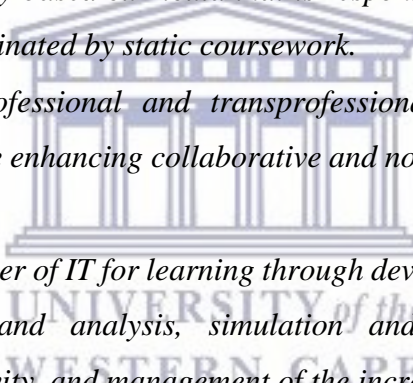
Health professions' education (HPE) training programs has the responsibility of providing education that benefits both the specific professions as well as the community at large. More than two decades ago, Shugars et al. (1991) highlighted the need for HPE "to be a part of the solution to the problems facing health care" (p. 282). The World Health Organisation (WHO) in the African region highlighted that HPE was in need of immediate attention. They emphasised the need to ensure the relevance of education and training of health professionals to the health needs of the population served.

In addition, almost 20 years later a commissioned report published in *The Lancet* in 2010 presented the results of a comprehensive investigation into the current global status of HPE, highlighting the range of challenges that have emerged as a result of the increasing complexity of healthcare systems (Frenk et al., 2010). The authors of this report identified two key issues with regard to HPE in the 21st century: (1) the need for transformative learning to graduate leaders and change agents, and (2) recognition of the interdependence of role players involved in healthcare and HPE. Although these issues were identified as relevant, the challenge that remained were identifying relevant strategies that would assist health professional educators to instil these core competencies in our graduates.

Freeth (2001) emphasises that it is widely acknowledged that meeting the needs of individuals/groups/communities are far beyond the expertise of any single profession, and that genuine service delivery requires interprofessional collaborative care. IPE was seen as a vehicle for change as it was noticed that it could contribute one of the vital strategies that higher education programmes can employ to prepare health care providers to contribute to a new, more collaborative, future health care workforce.

The Lancet Commission, submitted by twenty diverse professionals and academic leaders recently reported that globally HPE has not prepared graduates to address the health challenges

of the twenty first century; and this is attributed largely to fragmented, outdated and static curricula (Frenk et al., 2010). The commission presented a vision for HPE that emphasised that all health professionals globally should be educated to mobilise knowledge, engage in critical reasoning and ethical conduct in order to produce a health workforce that is locally responsive and globally connected. In order to achieve this vision, the commission recommended a series of institutional and instructional reforms within the health professions' educations realm that would ultimately produce health graduates that are change agents, and a health education system that underscores local and global collaborative networks and engages with all stakeholders and communities. In alignment with the Lancet Commission, this research study focuses specifically on contributing to the instructional reforms within health professional education at the University of the Western Cape (UWC). The Lancet Commission recommended the following instructional reforms, according to Frenk et al. (2010):

- 
- *Adoption of competency-based curricula that is responsive to rapidly changing needs rather than being dominated by static coursework.*
 - *Promotion of interprofessional and transprofessional education that overcomes professional silos while enhancing collaborative and non-hierarchical relationships in effective teams.*
 - *Exploitation of the power of IT for learning through development of evidence, capacity for data collection and analysis, simulation and testing, distance learning, collaborative connectivity, and management of the increase in knowledge.*
 - *Adaptation locally but harnessing of resources globally in a way that confers capacity to flexibly address local challenges while using global knowledge, experience, and shared resources, including faculty, curriculum, didactic materials, and by students linked internationally through exchange programmes.*
 - *Strengthening of educational resources, since faculty, syllabuses, didactic materials, and infrastructure are necessary instruments to achieve competencies.*
 - *Promote a new professionalism that uses competencies as the objective criterion for the classification of health professionals, transforming present conventional silos.*

Following the Lancet Commission's recommendations, the transformation of HPE was seen as a priority by many higher education institutions across the world. It is foreseen that this transformation could prepare health professions' students for working collaboratively in teams

with the common goal of building a safer and better person-centred and community/population-oriented health care system (Interprofessional Education Collaborative Expert Panel, 2011). In South Africa, promising developments towards transforming health professions' education have been taking place (Mpofu, 2012). These developments include the following changes: Moving away from discipline-specific faculties to health sciences' faculties that include a combination of three or more of the following disciplines, viz. medicine, dentistry, pharmacy, nursing, public health, physiotherapy, occupational therapy, nutrition and dietetics, speech therapy and audiology. Integration of interprofessional/multidisciplinary core courses in the undergraduate health professions' curricula, which are commonly developed around health, primary health care, health promotion and ethics. Moving away from the teaching hospital to the teaching platform which includes hospitals, clinics and communities; in other words to all levels of care; and extended collaboration among faculties in the provinces where clinical platforms are shared with provincial health authorities. The WHO (2010, p. 18) reports that after almost 50 years of investigation, the implications of these developments are "optimised health services; reinforced health systems and improved health outcomes".

1.4 From a Traditional Model of Education to an Interprofessional Model

In 1988, the World Federation of Medical Education (WFME) acknowledged IPE by making a global call for all doctors to be trained with other health professions. As this was reinforced over the years (WFME, 1994), the president of the WFME claimed that the philosophy of teamwork had been established through IPE. This was emphasised by Walton (1995) who stated that a more cost-effective doctor was being produced who would be able to work as part of a team for the benefit of clients/patients and communities.

In 2006, WHO agreed to convene a study group in partnership with the International Association for Interprofessional Education and Collaborative Practice (InterEd) which had recently been launched, as IPE had been absent from any WHO publication for about 20 years (Barr, 2015). A request was made by WHO to the study group to interact with strategic policy makers both nationally and internationally to address prevailing healthcare difficulties. This group had to convince the WHO through demonstration how IPE and collaborative practice could relieve the global workforce crisis in health care (WHO, 2006). The group developed a frame of reference to assist stakeholders in IPE to test the appeal and the viability of a package of interprofessional proposals in the context of national and international needs, priorities,

resources and opportunities (WHO, 2010). WHO (2010) stated that the only shortcoming of the study group were that they did not report on the impact of IPE on the workforce crisis. Shortly after this the WHO published the report without recommending it. Following this report, the Health Professions' Networks nevertheless followed up on the report together with the newly established Health Professions' Global Network (HPGN) and discussed IPE as part of a series of two-week web-based discussions (WHO, 2010). This initiative resulted in 1 000 participants from 100 countries signing up, of whom 293 were from 44 African countries. The countries who contributed to the discussions were mainly from developing countries. These countries tended to specifically focus on interprofessional collaboration in education and practice with an emphasis on primary health care. These participants globally supported the incorporation of IPE into undergraduate programmes, providing early exposure for students to IPE, linking theory and practice, together with positive interprofessional role models (Wistow, Usher-Patel, Fusco et al., 2010). Eventually the opportunity to build on this significant initiative was lost but many other initiatives developed over time, including the Global Forum Partnership Initiative and the African Interprofessional Education and Collaborative Practice Network (AfrIPEN), which is elaborated below.

1.4.1 The Global Forum Partnership Initiative

In a response to The Lancet Commission's findings mentioned above, the Institute of Medicine (IOM) of the United States National Academy of Sciences established the *IOM Global Forum on Innovation in Health Professional Education* in 2011. This forum not only convened stakeholders to highlight contemporary issues in health professional education, but also supported an ongoing, innovative mechanism to incubate and evaluate new ideas. This incubator mechanism or “innovation collaborative” was multifocal, interprofessional and global. The IOM, through the Global Forum and affiliated innovation collaboratives, in a sense supported a global sharing of perspectives, as well as a largely self-sustained global collaboration mechanism. The Global Forum was tasked with applying an on-going, multi-national, interprofessional approach to illuminate promising innovations for achieving reforms in the instructional and institutional spheres. Four university-based innovation collaboratives, one in the US or Canada, one in Latin America or the Caribbean, one in Africa, and one in Asia, were identified through a competitive application process. These proposals were based on a two-year programme of innovative curricular and institutional development in response to one of the recommendations in the Lancet Commission's report. These innovation

collaboratives each represented formal partnerships between at least three complementary academic institutions. Stellenbosch University, in collaboration with UWC and the University of the Free State, was selected as the African innovation collaborative (Negandhi et al., 2015).

Negandhi et al. (2015) goes on to explain that the main aims of this group were to promote interprofessional core competencies (associated to graduate attributes). Also, to apply WHO's International Classification of Functioning, Disability and Health (ICF) as an interprofessional care framework for individuals, communities and health systems, and to build the capacity of all facilitators of learning (academic staff and health professionals) to become role models for interprofessional practice and collaboration.

1.4.2 African Interprofessional Education and Collaborative Practice Network (AfrIPEN):

In 2015, a newly established IPE network was established to represent South Africa in the global arena (AfrIPEN, 2016). AfrIPEN is crucial in recognising the need for IPE in HEIs and provides the platform to share learning experiences, engage in joint research projects and present emerging work at national and internal conferences. The representatives have met on two occasions at local conferences and are in the process of formalising this body. The objectives of the network are to:

- i) Recruit and mobilise policy makers, professional bodies, institutional leadership, faculties, service providers, funders and other champions to advance IPE in Africa.
- ii) Collaborate in identifying, developing, adapting and sharing IPE resources for the African context.
- iii) Utilise relevant global, regional and national networks and platforms to create an awareness of and mobilisation of IPE.
- iv) Advocate for and facilitate the inclusion of interprofessional collaborative practice (IPCP) into the scope of practice of all members of the health workforce.
- v) Advocate for and facilitate the integration of interprofessional collaborative competencies into health workforce curricula offered by education and training institutions in Africa.
- vi) Advocate for, promote and facilitate the cultivation of IPE values and competencies among faculties, preceptors and health practitioners in Africa.

- vii) Participate in international networks informing best practice models including, but not limited to, the WHO Global Research Interprofessional Network (GRIN), All Together Better Health (ATBH), Best Evidence Medical Education (BEME), and WHO Collaborating Centres (WCCs).
- viii) Conduct collaborative research to inform IPE in Africa. (AfrIPEN, 2016, p. 4)

AfrIPEN continues to play a crucial role in Sub-Saharan Africa in terms of developing and promoting IPE and collaborative practice in the form of teaching and learning practices and joint research. Reeves et al. (2016) report that national and international policy makers have repeatedly called for the use of IPE to better prepare health and social care learners to enter the workplace as an effective collaborator (Frenk et al., 2010; WHO, 2010; Institute of Medicine 2015). As a result, IPE is gradually being offered across health and social care sectors to an array of students (pre-qualification, post-qualification, continuing education) based in classrooms, simulation laboratories, clinical settings and increasingly through online (virtual) environments (e.g. Luke et al., 2010; Bridges et al., 2011; Palaganas et al., 2014). From this growing amount of empirical work, it is possible to see that IPE can have a beneficial impact on students' attitudes, knowledge, skills, and behaviours – also termed as collaborative competencies (Abu-Rish et al., 2012; Makino et al., 2013). In addition, evidence is growing which suggests that IPE can also positively affect professional practice as well as improving clinical outcomes (Kent & Keating, 2013; Reeves et al., 2013).

1.5 Interprofessional Education Core Competencies

Thistlethwaithe et al. (2014) explain that the shift in the use of the terms “learning objectives” to “competencies” can be linked to the movement in the 1960s and 1970s to define behavioural and observable objectives. For health professional students to be considered “competent,” they have to demonstrate that they have grasped a set of competencies. There appears to be a lack of consensus in the literature about the meaning of competency and capability and, as a result, it is used interchangeably. Bainbridge, Nasmith, Orchard and Wood (2010) state that IPE statements about competence recognise specific knowledge, skills, attitudes, values and judgments that are active, evolving and evolutionary. Capabilities on the other hand are considered by some educators to reflect more optimally the compulsion by which students and professionals respond and adapt to health care and systems changes on an ongoing basis (Walsh, Gordon, Marshall, Wilson, & Hunt, 2005).

For the purposes of this research study, the term competency will be used. Barr (1998) distinguishes and defines three types of competencies. Common competencies which are believed to be common to all professions. Complementary competencies which highlight one profession and complements those which distinguish other professions and thirdly, collaborative competencies encompassing proportions of competence which every profession needs to collaborate within its own statuses with other disciplines, including non-professionals, within community organisations, between organisations, with clients and their caregivers, with volunteers and community-based groups.

Barr (1998) was the first author to develop a set of core competencies for collaborative practice among health and welfare practitioners. These collaborative competencies included the following:

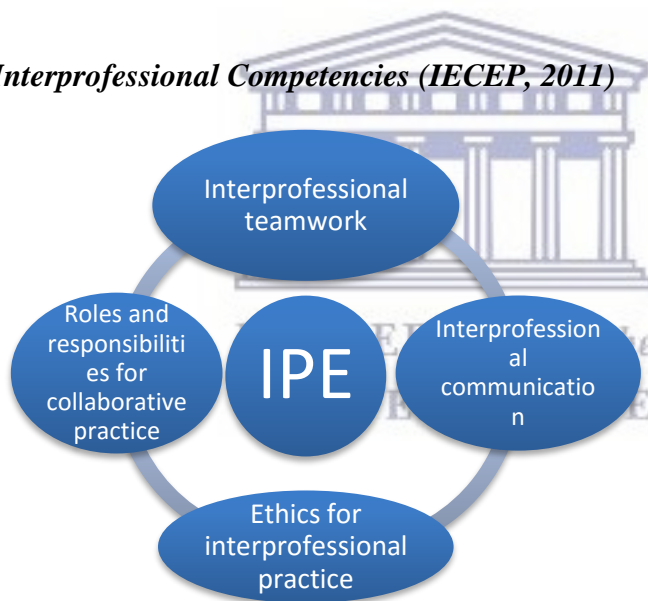
- i) the ability to describe an individual's role and responsibilities clearly to other professionals, together with the ability to make successful explanations to others;
- ii) the ability to recognise and observe the constraints of one's own discipline with the ability to identify needs in a broader context;
- iii) being able to recognise and show respect for others' roles, responsibilities, competence and constraints in relation to one's own profession but knowing when to involve others through preferred channels;
- iv) being able to evaluate services, effect changes, improve standards, problem-solve and resolve conflict during various interventions;
- v) the ability to assess, plan, provide and evaluate care with fellow professionals for individuals and caregivers;
- vi) being able to endure limitations, differences, ambiguities, misinterpretations and autonomous changes in fellow professionals;
- vii) the ability to enter into interdependent relationships, teaching and support of other disciplines, learning and being sustained by them; and
- viii) being able to facilitate interprofessional case conferences, meetings, team-working and networking.

Following Barr (1998), the Canadian Interprofessional Health Collaborative (CIHC) published a National Interprofessional Competency Framework in 2010. This framework is unique in that it relies on the ability of students and qualified healthcare professionals to integrate knowledge, skills, attitudes and values in arriving at certain judgments. Interprofessional competencies are

developed from these judgments to help achieve interprofessional collaboration. The six competency domains that the CIHC highlights are: i) interprofessional communication; ii) patient/client/family/community-centred care; iii) role clarification; iv) team functioning; v) collaborative leadership; and vi) interprofessional conflict resolution. The CIHC (2010) claim that there are two competency domains that are key in supporting the other four domains, and that they are interprofessional communication and patient/family/community-centred care.

Another set of interprofessional competencies was later developed by the Interprofessional Education Collaborative Expert Panel [IECEP] (2011) who identified a competency framework which mentions four core competency domains for interprofessional collaborative practice, viz: (i) interprofessional teamwork and team-based practice; (ii) interprofessional communication practices; (iii) values/ethics for interprofessional practice; and (vi) roles and responsibilities for collaborative practice.

Figure 1.1: Interprofessional Competencies (IECEP, 2011)



When facilitating interprofessional collaborative practice it is important to identify the core competencies that students need to develop or adhere to when working in interprofessional teams. The expert panel on “Core Competencies for Interprofessional Collaborative” reported on the need for core competencies in order to ensure that essential content is embedded in all health professions’ education curricula, guide curricula development to achieve outcomes and provide the foundation for a continuum of learning in interprofessional competency development. Furthermore, the IOM has identified four competencies for interprofessional teamwork. These are: (i) provision of patient-centred care; (ii) use of informatics; (iii)

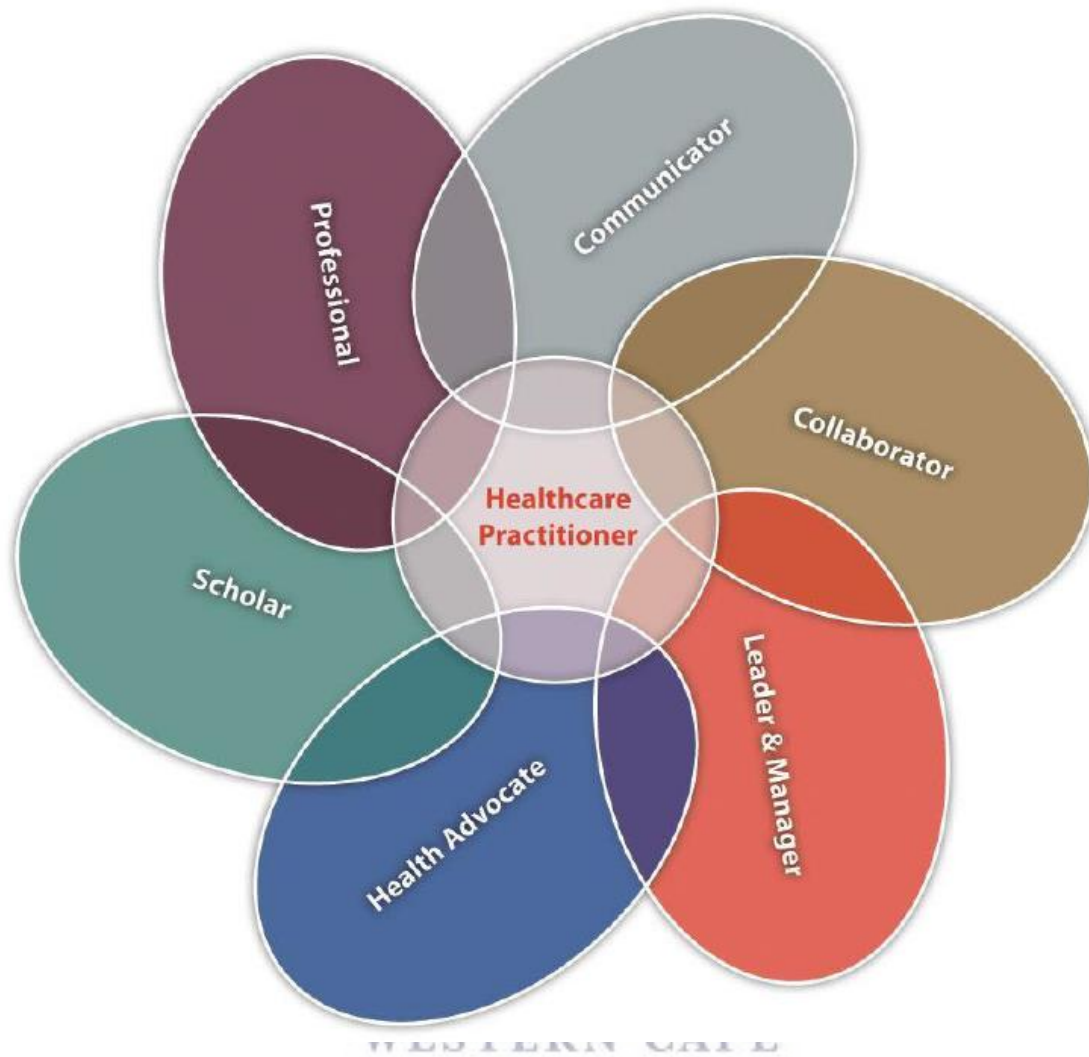
employment of evidence-based practice; and (iv) application of quality improvement measures. These competencies are based within the aforementioned four domains of the core competencies for interprofessional collaborative practice.

Figure 1.2: Competencies for Interprofessional Teamwork (IOM, 2011)



The Under Graduate Training Committee (UET) of the Medical and Dental Board of the Health Professions Council of South Africa (HPCSA) recently adopted a set of core competencies for medical, dental and clinical associate students. It is envisaged that these competencies, which are based on the CANMeds model of the Royal College of Physicians and Surgeons of Canada (Frank & Snell, 2014), will be accepted by all professional boards of the HPCSA and will form part of the council's accreditation criteria. The UET identified key and enabling competencies for seven different roles that an effective health professional should fulfil, which include being a health practitioner, communicator, collaborator, scholar, manager/leader, and professional and health advocate. In South Africa this document was adapted with the permission of the Royal College of Physicians and Surgeons of Canada, the Undergraduate Education and Training Subcommittee of the Medical and Dental Professions Board in collaboration with training institutions and the South African Committee of Medical and Dental Deans. This was described in an African Medical Education Directions for Specialists (AfriMEDS) document entitled Core competencies for undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa (HPCSA 2014:2-14). These adapted competencies are highlighted in Figure 3 below:

Figure 1.3: AfriMEDS Core Competencies.



In a study done by Mostert-Wentzel, Frantz and van Rooijen (2013), core competencies for community physiotherapy (PT) students, were identified through PT panelists with a specific background in clinical work, education and research. The roles and attributes that healthcare practitioners have to be competent in were: clinical practitioner, professionalism, effectiveness as a communicator and collaborator, experience as an evidence-based practitioner, ability to incorporate clinical prevention/health promotion, population health, community aspects of practice and health systems and health policy. It is evident that core competencies have been identified theoretically but how do we instil these competencies practically and evaluate whether we have instilled them in our students?

Brewer (2013) from the Curtin University introduced the IPE community to the Curtin Interprofessional Capability Framework in 2011. This framework highlights five capabilities

(which the writer refers to as competencies) which are required to interact with each other in order to achieve client-centred service; client safety and quality and collaborative practice. The capabilities are listed as: 1) communication, 2) team function, 3) role clarification, 4) conflict resolution, and 5) reflection. The additional competency not listed by the previous authors (Barr, 1998; CIHC, 2010; IECEP, 2011; Mostert-Wentzel, Frantz, & van Rooijen, 2013) is reflection (Brewer & Jones, 2011). Reflection is described as the ability to employ insightful processes in order to work in partnership with clients/family/community and others to warrant safe and effective services/care. It is also the ability to recognise and address personal learning needs with the aim of ensuring optimal service/care delivery by the team. Brewer (2013) further remarks that a student's capacity to demonstrate interprofessional competence in various settings will be determined by their comfort level, familiarity and skill-set within any given context.

Figure 1.4: Curtin Interprofessional Capability Framework (Brewer & Jones, 2011)



In 2016, the Interprofessional Education Collaborative [IEC] (2016) published an update on the core competencies for collaborative practice. The update reiterates the value and influence of the core competencies and sub-competencies as disseminated under the umbrella term, Interprofessional Education and Collaboration (IPEC). Secondly, the IEC proposes that the competencies (values and ethics, roles and responsibilities, interprofessional communication and teams and teamwork) now be grouped within a single domain called Interprofessional

Collaboration. Initially these four competencies were proposed as domains by the IEC within IPE (IECEP, 2011). The authors further state that since their initial publication it has emerged that interprofessional collaboration is a domain on its own. In addition, creating this shared classification could aid in streamlining and getting co-operation in educational activities and related assessment and evaluation processes among health professionals. The third leg of the update by the IEC (2016) was to expand the interprofessional competencies to better attain the Triple Aim (improve the patient experience of care, improve the health of populations, and reduce the per capita cost of health care), with specific focus on population health.



Table 1.1: Summary of IPE Core Competencies to highlight overlaps

Barr (1998)	CIHC (2010)	IECEP (2011)	IOM (2011)	AfriMed (2013)	Brewer (2013)	IEC (2016)
Describe roles and responsibilities; recognise and observe the constraints of own discipline; show respect for others; being able to evaluate services, effect changes, improve standards, problem solve and resolve conflict ; the ability to assess, plan, provide and evaluate care with others; ability to endure limitations, differences, ambiguities, misinterpretations and autonomous changes in others; ability to build relationships; and IP facilitation skills .	Interprofessional communication ; patient / client / family / community-centred care; role clarification ; team functioning ; collaborative leadership ; and interprofessional conflict resolution .	Interprofessional teamwork and team-based practice; interprofessional communication practices; values/ethics for interprofessional practice; and roles and responsibilities for collaborative practice .	Provision of patient-centred care ; use of informatics; employment of evidence-based practice; and application of quality improvement measures.	Health Practitioner, Communicator , Collaborator, Scholar, Manager/Leader , Professional and Health Advocate	communication , team function , role clarification , conflict resolution , and reflection.	Interprofessional Collaboration (values and ethics, roles and responsibilities , interprofessional communication , and teams and teamwork)

Table 1.1 illustrated the IPE core competencies and the colour coding gives an indication of the similarities between different authors and timeframes. The Canadian Interprofessional Health Collaborative (CIHC, 2010) was found, during a faculty focus group, to be the most comprehensive and most common set across all the literature, according to an IPE task team at UWC (Appendix C). Therefore, for the purposes of this research study, the researcher will refer to the Canadian Interprofessional Health Collaborative's (2010) six competency domains; i) interprofessional communication; ii) patient/client/family/community-centred care; iii) role clarification; iv) team functioning; v) collaborative leadership; and vi) interprofessional conflict resolution.

1.6 Current Status of Interprofessional Education in the Faculty of Community and Health Sciences

The interprofessional education programme in the Faculty of Community and Health Sciences (FCHS) started with the embedding of core modules into the curriculum offered to first, second and third-year students. These modules included “Health, Development and Primary Health Care”, “Interdisciplinary Health Promotion” and “Measurement of Health and Disease” respectively (Waggie & Laattoe, 2014). These core modules were considered fundamental in preparing students for the final and fourth-year level of interprofessional practice. Over the years several IPE and practice exemplars have been developed and offered to these final year students from the disciplines of Occupational Therapy; Physiotherapy; Nursing; Social Work; Dietetics, Natural Medicine; and Sports Science. Waggie and Laattoe (2014) highlight examples of these interprofessional exemplars which include the Interdisciplinary Community-based Practice Module that uses service-learning as the pedagogical approach. This module is carried out in a community setting whereby students practice in a structured collaborative manner. The second exemplar programme, Interprofessional Community-based Practice, is based on the core principles for interprofessional collaborative practice (Interprofessional Education Collaborative, 2011). Activities for the programme were diverse and included small group discussions, didactic input, video clips, role-play and case studies. The third exemplar programme described by Waggie and Laattoe (2014), the Interprofessional World Café, provides an opportunity for students to engage in discussion around the core interprofessional competency domains (Interprofessional Education Collaborative, 2011). The Interprofessional World Café programme began with didactic input based on current trends in the South African

healthcare context and the need for healthcare professionals to be trained to address complex healthcare issues globally as well as contextually.

Through these exemplars the FCHS at the University of the Western Cape has developed a scaffolded approach, where IPE and collaborative practice (CP) teaching and learning activities are offered in the curriculum, as well as co-curricular activities from first to final year (Rhoda, 2016). A number of developmental activities were offered to academics, clinical supervisors and clinical co-ordinators to equip them with the necessary knowledge and skills to act as facilitators in IPE and CP student activities (McClean, Cilliers & van Wyk, 2008). An interdisciplinary, community-engaged research project by faculty, was also embarked upon through a successful grant application to the National Research Foundation.

The FCHS is one of a few faculties in the country promoting both urban and rural based IPE experiences for its students. Since the inception of the Interprofessional Education Unit (IPEU), it has successfully integrated IPE and IPP into its undergraduate curricula across all disciplines in the faculty, extending opportunities across the Faculties of Dentistry and Science to pharmacy, dentistry and oral hygiene students. The IPEU was established to co-ordinate and to provide interprofessional opportunities for students and staff in order to enhance the IPE & IPP experience in the faculty. IPE is endorsed across the three programmatic areas of teaching and learning, research and community engagement at UWC. Strategic IPE aims and objectives are currently refined for each of the three areas:

- a) Teaching and Learning includes:
 - i) Interprofessional core curricula which are embedded in the syllabus of all professional programmes. At first-year level all students need to register for a Primary Health Care module, at second-year level in an Interdisciplinary Health Promotion module and at third-year some departments offer the Measurement of Health Disease module which is a qualitative research module.
 - ii) Interprofessional practice takes place during fieldwork placement at third- and fourth-year levels. Where two or more disciplines are placed concurrently, students are expected to either engage in a joint project or meet one afternoon during the week to discuss a particular case of interest which is common to most disciplines.
 - iii) Interprofessional World Café is an event that takes place once per term whereby all disciplines are invited to participate in a one-day workshop to interact with students from other disciplines.

- iv) Faculty developments are opportunities for staff to be familiarised with the latest developments in IPE and to participate in shaping the vision for faculty in advancing the agenda for IPE.

- b) Research
 - i) Setting a collaborative research agenda in the faculty whereby all disciplines can work on joint niche areas and publish.
 - ii) IPE postgraduate courses and programmes still need to be developed.

- c) Community Engagement
 - i) IPE service-learning is important in establishing specific sites for students to work collaboratively as clients/groups/projects
 - ii) IPE community development initiatives are important in building partnerships with communities for student placement that will contribute to community development.
 - iii) Local and international networks for IPE established to draw both on expertise and to promote the local IPE advancements globally.

It is thus evident that the FCHS has a long long history of innovative activities, curricula and research promoting IPE opportunities at UWC and with various stakeholders in the community. The foundation of the success in this emerging area can be attributed to the establishment of the Interprofessional Education Unit (IPEU) in 1998. The IPEU then conceptualised the idea that learning together could ultimately promote collaborative practice. As such, IPE has been conceptualised at UWC but the activities and opportunities that currently exist do not take place within a structured framework. Charles, Bainbridge and Gilbert (2010) explain that such a framework in the form of a model can give clear guidance to future emerging IPE curricula, academic activities and research to ensure that IPE core competency development is instilled in students. Currently students are only being exposed and immersed in IPE, but mastery is dependent on that specific point which a student has attained in his/her professional training. As educators we need to be cognisant of the fact that students and practitioners have different levels of readiness as well as different learning needs at different times in the learning process (Cone & Harris, 1996). The development of this model can be seen as a tool to manage learning (De Weerd et al., 2002), which in turn will help us to be sensitive to the learning needs of students and practitioners. This model will provide a framework for understanding and

developing IPE experiences, bearing in mind the distinct needs of students and practitioners at various points in their under/postgraduate training and professional careers.

1.7 Aim of this Study

To develop an interprofessional education model that aims to instil the core competencies of interprofessional collaborative practice in allied health students (change of title - Appendix E).

1.8 Research Questions

1. What are the findings of previous research studies instilling interprofessional core competencies in higher education programmes?
2. What specific interprofessional core competencies are most commonly used and how are they instilled in students?
3. Which interprofessional core competency framework is most preferred by higher education institutions on a global level?
4. What activities are best suited to instil each interprofessional core competency in a scaffolded curriculum?
5. What assessment practices can be used to evaluate interprofessional core competency development within students?
6. How ready are students to engage in interprofessional learning activities at various year levels?
7. How can interprofessional core competencies be incorporated successfully into a comprehensive curriculum for allied health students?

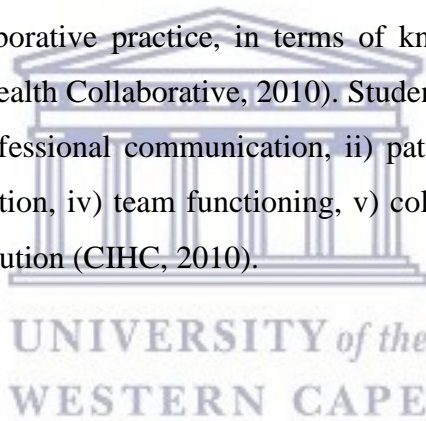
1.9 Objectives

- a) To assess the current intervention strategies used to evaluate interprofessional core competencies in students.
- b) To determine and compare the readiness of first and senior-level students for interprofessional learning.
- c) To describe activities and evaluation strategies that could be used to develop core competencies through a Delphi study.
- d) To identify the occurrence of IPE core competencies in curricula and to understand the similarities of IPE core competencies and graduate attributes.

- e) To develop an IPE model that incorporates the core competencies of IPCC as an outcome for the University of the Western Cape
- f) To position the current IPE programme within a proposed model.

1.10 Significance of the Study

The ultimate aim of IPE and collaborative practice is to provide patients/clients/families/communities with better-quality health outcomes. This can only occur in an environment whereby students/practitioners, patients/clients/families and communities are enabled to develop and maintain good interprofessional working relationships (Canadian Interprofessional Health Collaborative, 2010). The significance of this study, therefore, will assist the FCHS at UWC to implement an interprofessional curriculum embedded in all programmes across the faculty. The proposed model will provide guidelines to instil interprofessional competencies in students that could enable them to make appropriate judgments essential for collaborative practice, in terms of knowledge, skills and attitudes (Canadian Interprofessional Health Collaborative, 2010). Students should be competent in the following spheres: i) interprofessional communication, ii) patient/client/family/community-centred care, iii) role clarification, iv) team functioning, v) collaborative leadership, and vi) interprofessional conflict resolution (CIHC, 2010).



1.11 Definition of Terms

Interprofessional education: "...when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes" (CAIPE, 2002).

Interprofessional collaborative practice: "When multiple health workers from different professional backgrounds work together with patients, families, carers [sic], and communities to deliver the highest quality of care" (WHO, 2010, p. 7).

Core competencies: "Dimensions of competence which every profession needs to collaborate within its own ranks, with other professions, with non-professionals, within organisations, between organisations, with patients and their carers, with volunteers and with community groups." (Barr, 1998, p. 184).

Interprofessional Teamwork: “The levels of cooperation, coordination and collaboration characterising the relationships between professions in delivering patient-centred care” (Interprofessional Education Collaborative Expert Panel, 2011, p. 2).

Interprofessional roles and responsibilities: “Use the knowledge of one’s own role and those of other professions to appropriately assess and address the health care needs of patients and to promote and advance the health of populations” (Interprofessional Health Collaborative, 2016, p. 10).

Interprofessional communication: “Communicate with patients, families, communities, and professionals in health and other fields in a responsive manner that supports a team approach to the promotion and maintenance of health and the prevention and treatment of disease” (Interprofessional Health Collaborative, 2016, p. 10).

Teams and teamwork: “Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan, deliver and evaluate patient/population/population-centred care and population health programmes and policies that are safe, timely, efficient, effective and equitable” (Interprofessional Health Collaborative, 2016, p. 10).



1.12 Thesis Layout

Chapter One

The first chapter of the study introduces the reader to the field of interprofessional education and the progression of the development of core competencies. The collaborative practice competency domain is explored together with its accompanying values: i) interprofessional communication, ii) patient/client/family/community-centred care, iii) role clarification, iv) team functioning, v) collaborative leadership, and vi) interprofessional conflict resolution (CIHC, 2010).

Chapter Two

This chapter introduces the mixed methodology that was used in the study as well as explaining the different processes that were followed at the different stages. This chapter provides an

overview of the steps followed, and the in-depth detail is specified in each chapter to avoid duplication.

Chapter Three

Chapter Three highlights the systematic review that was conducted to determine the amount of higher education programmes being implemented that instil interprofessional core competencies into their curricula. Of these programmes, the study elaborates on the understanding of the main competencies being used by universities and the strategies that support the implementation thereof. This initial stage of the study provides a further rationale for the study, since there were only seven studies found that met the criteria and, of these studies, none emanated from South Africa.

Chapter Four

Chapter Four reflects a further stage in the study by conducting a survey, Readiness for Interprofessional Learning, to determine how prepared students are to engage in interprofessional learning. The study was conducted with first year and senior-level students and the results for each group compared to understand if there are different levels of preparedness in relation to the interprofessional activities they are exposed to over the duration of their studies.



Chapter Five

In Chapter Five a Delphi Study was conducted with a panel of international experts to determine what activities could be used effectively for each interprofessional core competency, what assessment practices would be appropriate, any additional competencies that could be added to the existing list and guiding principles for integrating interprofessional education into curriculum. A total of 18 experts were recruited and only two rounds were necessary to reach consensus among the panel over a period of 12 months.

Chapter Six

Chapter Six includes a curriculum-mapping exercise whereby graduate attributes were analysed with IPE core competencies to determine the overlap with the intention of developing an integrated document that faculty could infuse into their curricula.

Chapter Seven

Chapter Seven describes the interprofessional education model that developed which incorporates all elements of the research study as a whole.

Chapter Eight

Is a general discussion and includes an overview, summary of significant findings, implications of the research, recommendations and final conclusions for future studies, as each chapter represents a different stage in the study with its specific conclusions for that section.



CHAPTER 2

2 METHODOLOGY

2.1 Introduction

Chapter One provided the background to the study as well as the aims and objectives of the study. The objectives of the study are to develop an interprofessional education model that aims to instil the core competencies of interprofessional collaborative practice into allied health students' curricula. This chapter provides an overview of the methodological framework of the study. To achieve this aim, the study employed a mixed method sequential exploratory approach, using i) a systematic review, ii) Delphi study, iii) a quantitative questionnaire data set, and iv) curriculum mapping.

2.2 Mixed Methodology

The term mixed method research is described as the combination of quantitative and qualitative research methods (Hanson, Creswell, Plano Clark, Petska & Creswell, 2005). The authors believe that when the two research methods merge, the researcher's findings are likely to be enhanced. Creswell, Klassen, Clark, and Smith (2011) define mixed methods research as a research approach or methodology concentrating on research questions that call for real-life circumstantial understanding. They offer multi-level perspectives and cultural influences; using rigorous quantitative research to assess the extent and frequency of constructs. It includes rigorous qualitative research to examine the significance and understanding of constructs; employing multiple methods (e.g.; intervention trials and in-depth interviews); purposely integrating or linking these methods to draw on the strengths of each; and framing the research within philosophical and theoretical positions.

Mixed methods researchers use, and often clarify, varied philosophical positions. These positions are usually stated as dialectal stances that link post-positivist and social-constructivist worldviews, pragmatic perspectives and transformative perspectives (Greene, 2007). For example, researchers who embrace different philosophical positions may find mixed methods research to be perplexing because of the tensions created by their diverse beliefs (Greene, 2007). However, mixed methods research can represent the prospect of transforming these tensions into new knowledge through a dialectical discovery of information. A practical

perspective draws on engaging “what works,” using diverse approaches, giving priority to the importance of the research problem and questions, and evaluating both objective and subjective understanding (Morgan, 2007). A transformative viewpoint suggests an orienting framework for a mixed methods study based on creating a more just and autonomous society that saturates the entire research process, from the problem to the conclusions, and the use of results (Mertens, 2009).

In mixed methods studies, investigators purposefully integrate or combine quantitative and qualitative data rather than keeping them separate. The basic perception is that the combination of quantitative and qualitative data maximises the strengths and minimises the weaknesses of each type of data. This idea of combining the two methods separates current views of mixed methods from older perspectives in which researchers collected both forms of data, but kept them separate or arbitrarily combined them, rather than using systematic integrative procedures. One of the most difficult challenges is how to incorporate different forms of data. Three approaches are discussed in the literature (Creswell et al., 2011) as merging data, connecting data and embedding data.

Creswell et al. (2011) claim that the research methods in a study must fit the research problem or question. Research studies most suitable for mixed methods are those in which the quantitative approach or the qualitative approach by itself is insufficient to develop numerous perspectives and a complete understanding of a research problem or question. For example, quantitative outcome measures may be understandable using qualitative data. Alternatively, qualitative studies may usefully occur prior to the development of a suitable instrument for measurement. By including qualitative research in mixed methods, health science researchers can study new questions and initiatives, multifaceted phenomena, hard-to-measure constructs and interactions in specific everyday contexts in addition to experimental settings.

The advantages of using mixed method research are that it affords strengths that balance the weaknesses of both quantitative and qualitative research. For example, quantitative research is weak in understanding the context or setting in which people behave, which aspect is addressed by qualitative research. In contrast, qualitative research is seen as lacking because of the potential for biased understanding made by the researcher and the difficulty in generalising findings to a large group of people. Quantitative research does not have these shortcomings. By using both types of research, the strengths of each method can balance the weaknesses of

the other. It also provides a more widespread and complete understanding of the research problem that neither quantitative nor qualitative approaches can solely provide. Mixed method provides an opportunity for developing better, more context-specific research tools (for example, by using qualitative research it is more likely to gather information about a certain topic or idea in order to develop an instrument with greater construct validity) and, finally, it can help to explain results or how causal processes work (FRRC, 2016).

The FRRC (2016) point out some of the disadvantages and limitations of mixed method research are that the research design can be very intricate; it is more time-consuming and resource-intensive to plan. To implement this type of research; it may be challenging to plan and implement one method by drawing on the findings of another; and it may be inconclusive in the resolution of inconsistencies that arise in the interpretation of the research findings. Some of these challenges are highlighted below, together with the approaches that the researcher took to overcome them.

2.3 Research Setting

This research study was conducted in the Faculty of Community and Health Sciences (FCHS) at the University of the Western Cape (UWC), Cape Town, South Africa. UWC is a public university situated in Bellville, Cape Town, South Africa, established in 1960 under the apartheid government as a higher education institution for the training of non-white students for lower and middle civil service positions. In 1982, the institution opened its doors to all South Africans and, through its mission statement, made a public statement that it rejected the notion of segregated education.

The institutional report of the Higher Education Quality Committee (2008) audit of UWC, highlighted a limitation in the Institutional Operating Plan of UWC (2004-2009), in that the characteristics of a UWC graduate were not embedded within programmes, and were therefore not included as educational outcomes and assessed accordingly. In addition, it was necessary that the six Interprofessional Core Competencies adopted by the FCHS (2016) needed to be embedded into the learning outcomes across all academic programmes in the faculty. As a response to the above audit report, UWC developed the Charter of Graduate Attributes, which is based on a commonly used framework (Barrie, 2004), highlighting what it is, in addition to discipline-specific outcomes, that distinguishes a UWC graduate from other graduates.

However, since the charter is a relatively new document, only a few departments at UWC have gone further than incorporating the attributes into their administrative documents, while others are in the process of writing the attributes into their curricula. If the implementation and assessment of graduate attributes and IPE core competencies are to advance the institution in terms of producing twenty-first century graduates, we need better to understand how we can change teaching and learning methods that would facilitate the development of these attributes and core competencies in students at UWC.

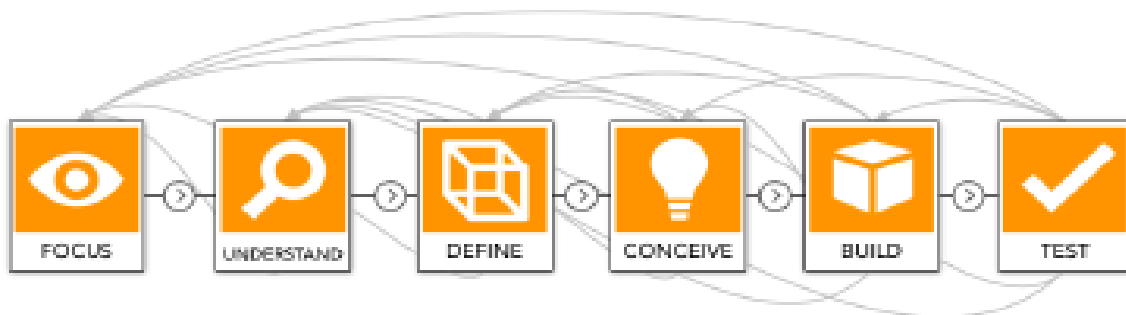
This research study arose out of a need for departments to incorporate graduate attributes into the learning outcomes of all modules. Instilling interprofessional core competencies was recognised by faculty as a need to improve teaching and learning strategies, thereby preparing a graduate who is able to work collaboratively with other health professionals in the field. It makes sense at a faculty level to combine graduate attributes and interprofessional core competencies so as not to confuse students and departments. These competencies will be introduced through a scaffolding design, which would allow for increased complexity at different year levels through a variety of instructional techniques (Frantz & Rhoda, 2017).

2.4 Research Design

McKenney and Reeves (2012) state that design research has been shown to be an effective method for conducting research in higher education. It is noted that assessing these research projects can be challenging because there is no recognised method for this approach. There are, however, features shared with other methodologies that can assist in the development of sound design research projects. Design-based research was best suited for this research study as the rationale behind the use of the design-based research is that it focuses on using design in the service of developing broad models of how individuals think, know, act and learn. It is a critical element of design-based research in that the design is conceived not just to meet local needs but to advance a theoretical agenda, and to discover, explore, and confirm theoretical associations (Barab & Squire, 2004). Easterday, Lewis and Gerber (2014) describe design-based research (DBR) as a method that combines design and scientific methodology, allowing researchers to produce useful tools and effective theory for solving specific (individual and/or collective) problems in education. The design and DBR processes comprise six iterative phases in which researchers focus the problem, understand the problem, define goals, conceive the

outline of a solution, build the solution and test the solution (Figure 2.1). The design-based research process for this study is described below according to the six phases

Figure 2.1: DBR process



2.4.1 Focus

The importance of this phase is that it sets the direction of the research project. A specific design is meant to accomplish an envisioned goal that exists because of an opportunity to address a problem and ensure that there is something worth designing and that the researcher has the capability to succeed. In the focus phase the researcher conducted a systematic review to determine the need for the research study in the South African context. The research topic and focus developed from the systematic review, as it specified the general problem that the aim of the study would be addressing and how it had developed. The scope of the study specified the limitations and the scale of the research project.

2.4.1.1 Systematic review

Uman (2011) explains that systematic reviews, as the name implies, classically involve a detailed and comprehensive plan and search strategy with the objective of reducing preference by identifying, appraising, and synthesising all applicable studies on a specific topic. According to Cochrane Collaboration (2012, p. 1), “a systematic review is a high-level overview of primary research on a particular question that tries to identify, select, synthesise and appraise all high quality research evidence relevant to the question in order to answer it.” Thus it would be an appropriate way to focus this study. A systematic review typically has five steps, which include framing the question, identifying relevant work, assessing quality of studies, summarising the evidence and interpreting the findings (Khan, Kunz, Kleijnen & Antes, 2003).

i. Formulate the review question

The first stage involves developing the review question. The question should include the group of interest, the intervention being investigated, the control or comparison group and the outcomes of interest (Uman, 2011); thus we look at the PICO or PIO. The review question for this systematic review was: How do professional programmes incorporate Interprofessional Core Competencies in their interprofessional curricula and on which competencies are they focused?

ii. Identifying relevant work

At this stage of the review, it is important to identify the sources to be searched and the selection criteria, in order that inclusion criteria and exclusion criteria are identified. The Cochrane Collaboration acronym PICO (or PICOC), which stands for population, intervention, comparison, outcomes (and context) can be beneficial in guaranteeing that researchers decide on all key components prior to starting the review. It is also essential to describe operationally the types of studies to include and exclude, (e.g., randomised controlled trials (RCTs) only, RCTs and quasi-experimental designs, qualitative research or quantitative research studies), the minimum total of participants in each group, published versus unpublished research studies, and language boundaries. Uman (2011) advises that at this stage it could be extremely helpful to approach a reference librarian to assist in developing and running electronic searches on the topic/title. It is important to establish a widespread list of key terms (i.e., “MeSH” terms) associated with each component of PICOC to be able to identify all applicable research in a given area. The search terms are constructed after a review of relevant literature and included terms such as core competencies for interprofessional collaborative practice (used as a search item phrase, because many reviews have been done on IPE but not on IPE core competencies). The second term was interprofessional collaboration, as well as undergraduate health sciences students (such as Dietetics, Occupational Therapy, Physiotherapy, Social Work, Natural Medicine, Sports Science, Nursing, Pharmacy, Dentistry and Oral Health).

A comprehensive search was conducted in databases and specific journals such as Ebscohost (Academic Search Complete, ERIC), Directory of Open Access Journals (DOAJ), PubMed, PubMed Central, BioMed Central Journal, ScienceDirect and Journal of Interprofessional Care for the period of 2005-2015. The researchers selected these sources as they were found to be the most comprehensive source of references to interprofessional education at the time of the

review. Manual searching of reference lists was undertaken and articles referred to the author by experts in the field were included.

Criteria for inclusion into the study were: (i) publications in the English language; (ii) publication dates between 2005 and 2015; (iii) qualitative studies; (iv) quantitative studies. Studies, which generally focused on Interprofessional Education programmes, were considered but if they did not have development of core competencies as an outcome, they were excluded from this study.

iii. Assessing quality of studies

When a comprehensive number of abstracts have been saved and studied, all studies appearing to meet inclusion criteria are retrieved and reviewed in full. This step in the review is normally completed by at least two reviewers to establish inter-rater reliability (Uman, 2011). It is strongly suggested that both authors keep a record of all reviewed articles, together with their reasons for inclusion or exclusion, and it may be required to contact study authors to obtain omitted information needed for data pooling, (e.g., means, standard deviations). The authors may also need to determine if translations will be required. Khan et al. (2003) indicate that studies should be subjected to thorough methodological assessment as this can assist in deciding whether to include the studies into the review, as well as exploring the heterogeneity of the articles. The quality assessment of the articles was done using the data extraction and quality assessment form (Glasgow, McKay, Piette & Reynolds, 2001 & Blackman, Zoellner, Berrey, Alexander, Fanning, Hill, & Estabrooks, 2013). Each article was allocated a percentage out of 100. The rating score had three levels: weak ($\leq 30\%$); moderate (30-70%) and strong ($>70\%$) – Table 2. Studies were excluded if one component of the assessment was weak ($<30\%$) and if one of the interprofessional core competencies was not used as an outcome of the intervention. A narrative synthesis of the included studies was carried out.

iv. Extract data and summarise the evidence

Data extraction by at least two reviewers is vital for establishing inter-rater reliability and evading data entry inaccuracies. A simple data extraction form or table can be very helpful in organising the information extracted from each reviewed study (e.g., authors, publication year, number of participants, age range, study design, outcomes, included/excluded) according to Uman (2011). In this study, a self-developed data extraction form was used to extract the data from the studies, using criteria that were determined prior to the data extraction phase. The data

extraction form was designed to extract information such as author, country, population, health education topic, intervention aims for participants, outcomes and implications for peer education programmes (Table 3). Reviewers compared opinions and reached consensus on the final articles to be included in the review.

v. Analyse and interpret results

A number of statistical programmes are available to calculate effects sizes for meta-analyses, such as the Review Manager (RevMan) programme endorsed by the Cochrane Collaboration, among others. The effect sizes are indicated together with a 95 % confidence interval (CI) range, and presented in both quantitative format and graphical representation (e.g., forest plots). Forest plots are ideal to visually depict each trial as a horizontal diamond shape with the interior representing the effect size (e.g., SMD) and the end-points representing both ends of the CI. These diamonds are presented on a graph with a middle line signifying the zero mark. In addition, most programmes are able to determine a heterogeneity value to indicate whether the individual studies are comparable enough to associate. As with all papers, the final step in the writing process comprises a summary of the findings and providing recommendations for clinical work and research material for further research.

2.4.2 Understand:

The understand phase explores the research problem through empirical methods and secondary sources, and combines that knowledge into a form that can be easily used later in the research process. Empirical methods includes techniques related to human beings that can be performed quickly, such as observation, interviewing, surveys, data analytics, etc. During this phase curriculum mapping was done and a survey carried out amongst students to gain a better understanding of the research problem.

2.4.2.1 Survey research (Readiness for Interprofessional Learning Survey)

According to Isaac and Michael (1997: 136) survey research is used “to answer questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met. Also to establish baselines against which future comparisons can be made, to analyse trends across time, and to describe in general what exists, in what amount and in what context”. Kraemer (1991) identifies three distinguishing features of survey research, namely: it is used to describe quantitatively

particular characteristics of a given population (normally investigating the relationships among variables). Secondly, the data collected are usually from people and are, therefore, subjective; and, thirdly, survey research uses a designated percentage of the population from which the findings can later be generalised back to the population as a whole.

Survey research is an especially useful approach when a researcher aims to describe, explain or compare features of a very large group or groups. In this case, the researcher used the Readiness for Interprofessional Learning Survey (RIPLS – Appendix G) to determine the readiness (feature) of first year students to engage in interprofessional learning and to compare this result to senior students' interprofessional learning to ascertain whether readiness has increased over the duration of student training.

2.4.2.1.1 Population and sampling

Population

The population for this study included first year students from the following disciplines: Dentistry, Dietetics, Natural Medicine, Nursing, Occupational Therapy, Oral Health, Pharmacy, Physiotherapy, Social Work, and Sports Sciences registered for the Primary Health Care (PHC) interdisciplinary module in the 2015 and 2016 academic year. In addition, final year students in the following disciplines: Nursing, Occupational Therapy, Pharmacy, Physiotherapy, Social Work, and Sports Sciences were also targeted for this aspect of the study. These two groups of students were selected as the participants of the study as it allowed the researcher to determine if there was any progression in the levels of readiness along the continuum of learning in undergraduate studies.

Sampling

Convenience sampling was used where students from the abovementioned disciplines were invited to participate in the study from the PHC classes. A total of 798 first-year students was targeted and 295 completed the questionnaires, yielding a response rate of 37%. In addition, a total of 281 senior students was approached and was available to participate in the study, yielding a response rate of 100%.

2.4.2.1.2 Data collection methods and tools

A 19-item Likert scale, Readiness for Interprofessional Learning Scale (RIPLS) (see Appendix A), adapted from Parsell and Bligh (1999) (1, strongly disagree to 5, strongly agree) was used

in this study to assess attitudes towards interprofessional education. Parsell and Bligh (1999) divided the survey into three main areas namely *team-work and collaboration*, *professional identity* and *roles and responsibilities*, each having nine, seven and three items respectively. 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. Parsell and Bligh (1999) confirmed this questionnaire to be a valid research tool. Test-retest was performed, and Cronbach's alpha coefficient was applied to assess reliability and internal consistency of the instrument. The Cronbach's alpha's cut-off point was 0.7 and the author's confirmed face and content validity of the questionnaire confirmed, as it was internally consistent. The Cronbach's alpha was 0.92. The intra-class correlation (ICC) was above 0.7 in each subscale. The RIPLS questionnaire was confirmed by others to be valid and reliable and could be used to assess interprofessional readiness (Carpenter, 1995; Hind, Norman, Cooper, Gill, Hilton, Judd & Jones, 2003; Horsburgh, Lamdin, & Williamson, 2001; Morrison, Boohan, Moutray, & Jenkins, 2004). The extended version of the RIPLS tool had 29 statements and did not include demographic factors.

2.4.2.1.3 Data collection procedure

A pilot study was conducted with one of the thirteen classes participating in the interdisciplinary module. The researcher met with all the facilitators of the module to explain the nature of the pilot study and asked them to engage with their students to attract an eagerness to participate in this process of the research. Facilitators gave feedback to the researcher and the class who showed the most interest was chosen to conduct the pilot study with. The researcher had an information session with the students, obtained written consent and administered the questionnaire to the participants at a convenient date and time. Students were asked to participate voluntarily in the pilot prior to the start of the module since the researcher wanted to administer the questionnaire to the rest of the classes at the first official lecture. 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. It also allowed the researcher to establish the time it would take to complete the survey, which would be important in negotiating slots in the other classes. During the pilot study it was found that students had minor difficulty with the negatively-loaded statements, but after some explanation from the researcher, the students were able to complete the survey. The researcher also found that it was important to emphasise to students the completion of the

demographic section of the survey, as some students failed to fill in parts of this section which could cause difficulties during the analysis of the survey. With some explanation before administering the survey, these two findings were satisfactorily dealt with. Since no major difficulties were encountered during the pilot study and because no further changes were necessary to the questionnaire, the questionnaires were included in the main study.

The researcher met with all the facilitators of the interdisciplinary modules during their weekly meeting to explain the nature of the research study and to request an available timeslot during their next class to administer the survey to all students. It was decided that the researcher would meet with all facilitators in their next weekly meeting before the start of class hours in order to train the facilitators on how to administer the questionnaire and to become familiar with the instrument. Facilitators would also have 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 be administered 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 interdisciplinary class by these facilitators who had been 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.

2.4.2.1.4 Data analysis

Data from the RIPLS were captured and analysed by Statistical Package for the Social Sciences (SPSS) software. According to Muijs (2004) SPSS is, in all probability, the most common statistical data analysis software package used in educational research and is available at most higher education institutions. It is fairly user-friendly and extremely flexible in terms of the desired results required of an assortment of research studies. This does not necessarily mean that it is the best or the only software package, but SPSS is by far the most commonly used statistical data analysis software. It is a Windows-based programme, and shares many features with other Windows-based software. Applicable items on the Negative Professional Identity and Roles/Responsibilities subscales were reverse-coded prior to analysis in SPSS (McFadyen, Webster, Strachan, Figgins, Brown, & McKechnie, 2005). Mean scores on the RIPLS and its four subscales were compared by dichotomised demographic variables, including gender, age, discipline and year level, through Levene's test in SPSS for homogeneity of variance through a *t* test. Where significant levels were less than 0.05, the two groups were not equal in terms of

variances and therefore the assumption of homogeneity of variance was violated and the Equal Variances Not Assumed statistic was used. If the significant level was more than 0.05, the two groups were then equal in terms of variances and the assumption of homogeneity of variance was therefore met and the Equal Variances Assumed statistic in Levene's Test was used (Garson, 2012). In addition, descriptive statistics (frequency distribution) and percentages, were used to summarise demographic information and attitudes towards interprofessional learning.

2.4.2.2 Curriculum Mapping

Harden (2001) detailed two main purposes of curriculum maps in medical education. These were included to make the curriculum more apparent to all the stakeholders and to show the links between the various aspects of the curricula. Curriculum maps can aid in three primary ways according to Harden (2001):

- 1) ascertain whether the proposed material is actually being taught and what students actually learn;
- 2) demonstrate the associations among the different key components of the curriculum: learning outcomes, learning opportunities, content and assessment; and
- 3) examine specific aspects of the curriculum, such as learning location, learning resources and timetables, in addition to examining the curricula from multiple viewpoints.

Kelley, McAuley, Wallace and Frank (2008) define curriculum as the educational blueprint of any institution, school, college, department, programme or course. There are four different notions that form a curricula chain of connectedness which is embedded within this broad definition of curriculum (Porter & Smithson, 2001). The first notion is the intended curriculum, which is the planned curriculum found in course outlines or promotional material. This intended curriculum is usually approved by regulatory agencies such as the Department of Higher Education and/or the Health Professions Council of South Africa. By mapping this curriculum, the accrediting agencies can confirm that what they have defined as the required elements of a specific degree or diploma is, in fact, being delivered. The second notion is the enacted curriculum or what actually happens in the classroom (characterised by course outline). The third notion is the learned curriculum or, in other words, what students actually experience. The final notion is the assessed curriculum on which students are actually assessed, with regard to competence in the curriculum. Kelley, McAuley, Wallace and Frank (2008) suggest that by

viewing curriculum through these four lenses, a comprehensive picture can be formulated that comprises elements of design, delivery, and verification. It is based on this methodology that Chapter six will highlight the University of the Western Cape's Graduate Attributes (GA) and Interprofessional Core Competency documents to report on the overlap and determine the gaps between the two documents in the process of developing an IPE model. Curriculum mapping is defined as a method of plotting a programme to detect and highlight gaps in academia, redundancies and misalignments for purposes of refining the overall coherence of a process or set of outcomes (Abbott, 2014). Plaza, Draugalis, Slack, Skrepnek and Sauer (2006) explain that curriculum mapping demonstrates the links among the different key components of the curriculum and examining it from various perspectives. It is a reflection of when, how, and what is imparted, as well as the assessment measures utilised to explain the success of expected student learning outcomes (Harden, 2001).

The development of IPE core competencies is often seen as embedded in the hidden curriculum. Hafferty and O'Donnell (2014) best positions the hidden curriculum by highlighting four types or levels of the curriculum. The first level is the official curriculum which is normally approved by a recognised committee and endorsed by the tertiary institution. The second level is the informal curriculum which refers to the questions or discussions that students have outside of the lecture rooms with other students or the lecturer. The third level is the hidden curriculum which can generally be considered as what the university teaches students without them generally being aware that it is being taught. This curriculum is at the level of the institution's culture and context that shapes the way students make sense of their learning environments. The final level is the null curriculum, 'which are lessons that are noticeable by their absence. For example, if nothing is said about group dynamics within the formal curriculum, then students may conclude that these are insignificant content.

2.4.3 Define

According to Buchanan (1992), defining means converting an uncertain problem, which has no current solution, into a certain problem that can be unravelled. There are many ways to structure a research problem. The author provides the following example to demonstrate his point. If a researcher discovers that the participants are from immigrant communities, the researcher might want to improve these participants' performance on common core literacy and civic education standards. If there are gaps in research literature about how to influence learners' cultural resources, then the research problem could be stated in a number of ways.

The question could be asked, “how might we engage students in debates about legal status?” An alternative questions might be, “how might we teach students to construct video documentaries about immigration policy?” or “how might we teach students to analyse the political values in English/Spanish-language youth media?” By simply stating the phrase “How might we...?” the researcher changes the goal from the infinite and unknown number of goals that could be defined to a suggested or considered solution. It is essential that researchers define a specific goal which can be efficiently solved, bearing in mind the importance of that goal to the stakeholders. Only after the goal has been clarified, can design-based research be said to be successful or not successful. It is said that a novel problem-definition can be the central innovation that can lead to completely new kinds of solutions (Buchanan, 1992). In the define phase of this study , the researcher asked the question: how might we establish appropriate activities, evaluation strategies, additional core competencies and guiding principles for the implementation of IPE through a Delphi study?

2.4.3.1 Delphi technique

Theoretically, the Delphi process can be repeated continuously until consensus is reached. In most instances three rounds are claimed to be sufficient in collecting the required information from participants (Cyphert & Gant, 1971; Brooks, 1979; Ludwig, 1994, 1997; Custer, Scarcella & Stewart, 1999). Typically, in the first round of the Delphi process, open-ended questions are asked which serve as the foundation in lobbying for specific information about a content area from experts in that knowledge area (Custer, Scarcella & Stewart, 1999). Once the information is received from participants, the researcher/s need to convert this into a suitable questionnaire, which will serve as the survey instrument for the second round of data collection in the Delphi process. After conducting a literature review, it is also an accepted practice to use a structured questionnaire in round one of the Delphi process if basic information concerning the specific issue is available and usable (Kerlinger, 1973).

Hsu and Sanford (2007) go on to explain, in the second round of the Delphi process, that a second questionnaire be sent out to participants who are asked to give further input on the items summarised by the researcher/s, based on the data given during the first round. Participants may be required to rank or rate items in order to establish priorities amongst previous data given. In this critical round, any discrepancies or agreements will be identified (Ludwig, 1994, p. 54-55). Where disagreements may occur, participants may be asked to justify

their rating priorities in the data set (Jacobs, 1996). If there are no disagreements, then consensus can be reached and the actual outcomes can be presented to participants (Jacobs, 1996).

Should the need arise for the Delphi process to progress to the third round, then each participant will receive a questionnaire, which includes all data with ratings summarised by the researcher/s. Participants are then asked to review input given previously and, where necessary, to provide reasons for any statements that differs from what was agreed upon (Pfeiffer, 1968, p. 152). Compared to round two, one can only expect a minimal increase in the degree of consensus from participants (Weaver, 1971; Dalkey & Rourke, 1972; Anglin, 1991; Jacobs, 1996). In this research study a Delphi study was selected as the most appropriate technique to gather the opinions of experts on designing a model for IPE curricula. The researcher saw the Delphi technique as a group communication method which aims to achieve agreement on appropriate activities and assessment practices for IPE core competencies embedded in curricula. The Delphi technique was therefore ideal as a method for reaching consensus through a series of questionnaires administered through multiple iterations to accumulate data from a global panel of selected experts.

2.4.3.1.1 Population and sampling

Selection of the appropriate participants is regarded as one of the most important phases in the entire Delphi process as it directly impacts on the quality of the results produced (Judd, 1972; Taylor & Judd, 1989; Jacobs, 1996). Since the Delphi technique concentrates on prompting expert views over a short period of time, the selection of participants is usually reliant on the disciplinary areas of knowledge and skills required by the specific issue at hand (Hsu & Sandford, 2007). As interprofessional education is a relatively new development area in South Africa, it was initially difficult to identify local experts in the field. The researcher had to identify between fifteen and twenty participants, and names were garnered from the initial experts identified to include a diverse group of experts as far as was possible. Following this process, the participants made up a group of 29 participants. The experts in this group came from various organisations such as the Centre for the Advancement of Interprofessional Education (CAIPE) in the United Kingdom; the University of Missouri; Stellenbosch University (SU); the University of the Western Cape (UWC); the University of Cape Town (UCT); the University of Pretoria; the University of Sudan; the Suez Canal University; the University of Cairo; the University of North Carolina; the University of North Texas; the

University of Kwazulu Natal; the University for Development Studies; the University of the Free State; Curtin University; and an organisation called Psych Care.

2.4.3.1.2 Research design

The Delphi design falls under the broad classification of “consensus development techniques,” which in turn is under the general grouping of action research methods (Vernon, 2009). Avella (2016) reports that consensus techniques are normally applicable when there is limited evidence or when the existing evidence conflicts with the specific topic of interest. Delphi itself is uniquely relevant in areas where there is little previous research or where advantages could be beneficial in the collective subjective judgment of experts in a particular field (Hejblum et al., 2008). This technique has also been applied in large, multifaceted problems which were vague and plagued by a lack of clarity, and in situations where causation could not be established (Yang, Zeng, & Zhang, 2012). Delphi is largely qualitative in nature, but it can have a quantitative element depending on the specific application.

The basic design of this method involves gathering groups of experts without concern for geography, and who are asked, by means of a number of “rounds”, to respond to a specific question or questions through e-mail or other online tools (eg. Google forms) according to Linstone and Turoff (2002). After each round of the Delphi, participants receive feedback on the group response, which characteristically uses the method of highlighting points of agreement listed in order of most to least often mentioned.

Avella (2016) explains that the Delphi method historically falls into one of three types which differ by their purpose. A “Policy” Delphi is used when there is a need to formulate an approach to address a particular problem; a “Classical” Delphi is used to predict the future; and a “Decision-Making” Delphi is used to attain better decision-making. While these design types may differ in purpose, the carrying out of the design can take many different forms, regardless of the purpose.

The rounds process repeats itself with the goal of decreasing the number of responses until “consensus” is reached among participants (Linstone & Turoff, 2002). With each round of the Delphi, specific reactions receive increasing or decreasing comments, eventually resulting in a conclusion acceptable to all. Avella (2016) states that consensus does not mean 100% agreement, as it can be exceedingly difficult to get participants representing different

organisations/institutions with varying perspectives and priorities, to reach agreement. Vernon (2009) points out that a Delphi consensus typically ranges from 55 to 100% agreement, with 70% considered the standard. Usually it seems that early responses from participants exhibit wide ranges of options, but are quickly condensed after very few iterations (Fischer, 1978). It was therefore decided to adhere to the standard 70% on reaching consensus from participants in this study.

Researchers highlight two typical Delphi designs in the literature, “Delphi” or “Modified Delphi.” Delphi (often referred to as “Conventional Delphi”) is defined as the process wherein panel experts initiate the options in response to the researcher’s question(s). A modified Delphi, on the other hand, indicates the method whereby the initial options in response to the researcher’s questions are carefully selected before being provided to the panel (Custer, Scarcella, & Stewart, 1999). In this study a modified Delphi method was selected as the options given by the panel of experts had to be carefully chosen as they needed to link to specific IPE core competencies before being presented back to the panel to research consensus.

2.4.3.1.3 Data collection methods and tools

Once all the consent forms were received, the participants were sent a link to begin the Delphi process by completing an online questionnaire in Google Forms. Google Forms is a free, reliable online survey tool that is portable and responses can be downloaded into a Google spreadsheet or Comma Separated Values (CSV) file for further analysis of the participants’ responses (Young, 2017). CSV files are traditionally text files that contain information separated by commas (hence the name) that can be saved in a table-structured format. The first section of the questionnaire included a demographic aspect whereby participants had to indicate their discipline, years of experience in IPE, year level of student engagement in IPE and the average number of students engaged in IPE per annum. The Psychology Ethics Committee of the University of Aberdeen (PEC, 2014) posits that it is normal practice to assign a numerical reference to participants in research studies for the purposes of anonymity. It was particularly necessary in this study to track participants’ replies in order to verify their responses during the next round of the Delphi study.

2.4.3.1.4 Data collection procedure

The questionnaire was based on the six interprofessional core competencies identified by the Canadian Interprofessional Health Collaborative (CIHC, 2010), whereby participants were

asked to identify activities and methods of evaluation for each competency domain. After completing this task, participants were asked to identify any additional competencies that could be added to the list. The questionnaire was online which allowed participants to complete it at a time and space in which they were comfortable. The researcher enabled settings in Google Forms to be notified via email, and questionnaires were completed by participants according to their allocated participant number, which enabled the panel of experts to keep track of the total amount of completed questionnaires.

During round two, the researcher compiled a second questionnaire whereby participants had to rate the activities and assessment practices most favourable to instill IPE core competencies as presented in round one. The scale extended from 1-5, ranging from strongly agree to strongly disagree. The most common activity types and assessment methods were selected by the researcher from round one. Items were considered as 'common' where three or more participants made the same comment. The participants were given a space on the questionnaire to make any further comments should they feel that the items list was not appropriate or in alignment with comments they had made previously. Participants had to state whether they agreed with the listed assessments and activities by clearly stating "yes" or "no". Since there were no objections and no comments made indicating any inappropriateness of the listed items, the researcher concluded that consensus was reached at the completion of round two. This decision was communicated to all participants in addition to giving participants a final opportunity dispute the decision, to which there were no objections.

2.4.3.1.5 Data analysis

The questionnaires in the Delphi process included both qualitative and quantitative aspects. Hsu and Sandford (2007) emphasise that researchers need to find a suitable process to deal with the qualitative information collected. In this study the qualitative data in the form of comments was read together with suggested activities and assessment practices to further understand the reasons for listed items. Statistics used in Delphi studies can be interpreted by the use of a median score, which tends to be highly favoured when based on a Likert-type scale (Hill & Fowles, 1975; Eckman, 1983; Jacobs, 1996). Round two in this Delphi process incorporated a rating scale and the median scores for each core competency indicated consensus among the participants.

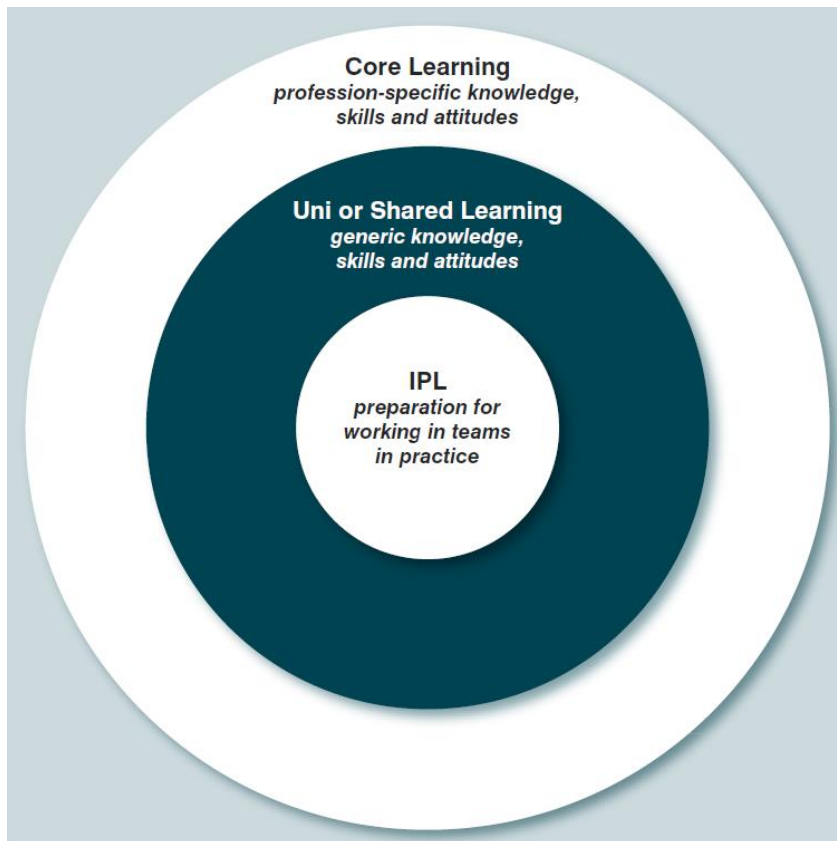
2.4.4 Conceive:

A plan for the solution to the research problem is normally drafted at this stage of the process. This involves visualising a solution and questioning whether it will be effective. The researcher has not committed to implementing the design during this phase, but rather creates a non-functional, symbolic or graphical representation that allows the researcher to analyse conceptually the solution by determining the components of the design and how they might work together. Researchers may also develop theoretical products (diSessa & Cobb, 2004) such as design arguments (Van den Akker, 1999), the underlying principles of which may be of different levels of complexity (Buchanan, 2001), and from communication to artifacts, services and systems (Penuel, Fishman, Haugan Cheng & Sabelli, 2011). The only difference between the conceive and build phase is between that of a conceptual plan inhibited only by the researcher's knowledge and that of a concrete prototype which is at least partially functional and controlled by a medium.

At this phase, the researcher has numerous tools for planning, sketching and modelling a research design. These tools allow researchers to test the research design against their own knowledge and theory, to identify problems and improve solutions before committing to implementation in a particular medium, which can be difficult, costly and time-consuming.

During this phase the IPE model was conceptualised. The Leicester Model of Interprofessional Education (IPE), outlined by Lennox and Anderson (2006), was used as a guideline for this study (Figure 2.2). This model is ideal as it shows the contextual setting within the overall health and social care curriculum in the Faculty of Community and Health Sciences (FCHS). The outer circle of the model represents profession-specific learning and the middle circle refers to the core competences shared with other professions, which can be learned as a shared learning experience or in uni-professional situations, for example, communication skills. The inner circle represents interprofessional learning in which students learn about, with and from one another to improve collaboration and the quality of care (CAIPE, 1997).

Figure 2.2: Leicester Model of Interprofessional Education (Lennox & Anderson, 2006)



The remaining two phases will not be part of this research study and are highlighted as a recommendation to be tested in the future. The phases are described below to highlight what they entail and to create a complete picture in the DBR process. The phases are:

2.4.5 Build

During this phase, researchers implement the solutions. Once the research design has been conceptualised, the researcher can implement the research design in a form that can be used. This implementation could be of lower or higher fidelity depending on the stage of the research project and the question that the research designer wants to exam, which may be about a specific aspect of the educational intervention, or whether the educational intervention as conceptualised can achieve the research aim. A specific research design must be employed to achieve an aim and, because a research design is never entirely completed, every implementation provides a model that can answer questions about whether the aim has been achieved.

2.4.6 Test

In the test phase, researchers evaluate the effectiveness of the solution. Iterative user-testing involves testing consecutive versions of the design at increasing levels of reliability. Early testing of the research plans produced in the conceive phase centres on questions of relevance and consistency and then on expected practicality, with expert criticisms and walk-throughs. Later testing on prototypes created in the build phase focus on questions of actual practicality and effectiveness, using 1-1, small group, field trials and their alternatives (Tessmer, 1993).

Testing often uses formative evaluation, which can quickly reject bad designs. This increases the probability of finding an effective research design that can be verified later through summative evaluation. Some researchers consider the margin between formative and summative evaluation the point at which design-based research ends, and the sciences of the artificial (Simon, 1996), or in this case, rigorous evaluation testing of strong causal claims of design principles, begins. Both forms are considered valid forms of testing in DBR. Testing provides the researcher with critical feedback about the success of the research design and the validity of the theoretical propositions. It tells the researcher whether the research design has achieved its practical and theoretical aims for a particular study.

2.5 Conclusion

This chapter has outlined the methodology that was employed in the research study, which was a mixed methods research approach. The specific research design was design-based research (DBR) as this was best suited to the aim of the study, which was to develop a model for IPE for the Faculty of Community and Health Sciences at UWC. The six iterative phases of DBR provided the structure for the study, which included phase one (Focus), a systematic review; phase two (Understand) a Readiness for Interprofessional Learning Survey (RIPLS) and a curriculum mapping exercise. Phase 3 (Define) included a Delphi study; phase four (Conceive) development of an IPE model; and phase five (Build) and phase six (Test) which did not form part of the study. In the next chapter, the process of the systematic review will be discussed.

CHAPTER 3

PHASE 1: FOCUS

3 SYSTEMATIC REVIEW

3.1 Introduction

In Chapter Three, the process of a systematic review is outlined. The purpose of conducting a systematic review is to determine how interprofessional interventions are used to develop core competencies amongst undergraduate allied health sciences' students. The search strategy, inclusion and exclusion criteria, methods of the review, appraisal tools, data extraction methods, results and discussion are outlined below.

3.2 Background

Interprofessional education (IPE) has been identified as a key aspect in transforming health professions' education to address the fragmented, outdated and static health professions curricula. The intention of an interprofessional approach to health and well-being is to provide optimum client care, diminish duplication of services, address the gaps in service delivery and to overcome adverse consequences to patients. For this reason an extensive interest has developed in IPE in undergraduate programmes globally. However, implementation of IPE programmes that equip students with core competencies, remains a challenge for higher education institutions, and obtaining an understanding of successful interventions would be helpful (Frenk et al., 2010).

Various reviews on IPE have been conducted previously. Reeves et al. (2016) recently published an update to a previous BEME review done in 2007. The aim of this update was to highlight the evolving nature of the IPE evidence through inclusion of 25 new IPE studies. The new studies were included with the original 21 studies from the earlier review to form a comprehensive data set of 46 high-quality IPE studies. In relation to Bigg's (1987) 3P model, the updated review found that many of the presage and process factors in the model, identified from the previous review, were reinforced in the newer studies. In regard to the products reported, the outcomes from the included studies are much more positive. The additional studies propose that students react well to IPE, their attitudes and perceptions of each other improve, and they indicate increases in collaborative knowledge and skills. Reeves et al. (2016)

further reported that a smaller degree of evidence shows changes in behaviour, organisational practice and benefits to patients/clients.

In another review conducted by Munro, Felton and McIntosh (2002), it was concluded that despite the fact that several studies have been published on interprofessional education, the methodological rigour of the studies did not allow the authors to accurately interpret the impact of IPE on professional practice. Mattick and Bligh (2003) conducted a systematic review focusing on interprofessional learning involving medical doctors and although methodological rigour was identified as a concern, the value of IPE and practice was still considered important to be an answer to improving health outcomes. Hammick, Freeth, Koppel, Reeves and Barr (2007) thus conducted a review that focused on identifying and reviewing the strongest studies that evaluated IPE in order to classify the outcomes and report the influence of context on them. It was reported by the authors that IPE initiatives are generally well received and enable improvement in knowledge and skills in the area of collaborative work. Most of the reviews conducted at this stage have a strong medical focus. Olson and Bialocerkowski (2013) conducted a review with a focus on allied health professionals. The authors reported that most of the studies reviewed focused on determining feasibility of IPE interventions and the extent to which interventions improved readiness for interprofessional practice. The authors also highlighted that transferability of interventions across professions, institutions and countries may not be as easy. Reeves, Zwarenstein, Goldman, Barr H, Freeth, Hammick & Koppel (2009) provided an update of Hammick et al. (2007) and reported that the more recent interprofessional studies indicated that learners still reacted positively to IPE with outcomes such as improved knowledge, attitudes and skills to collaborative practice. However, the effects of IPE on changes in behaviour, organisational practice, and benefits to patients/clients remained a challenge. The ongoing importance of the significance of IPE to collaborative practice and ultimately to healthcare processes and outcomes, cannot be overemphasised. These health outcomes can be achieved only if there is success in developing competencies in the graduates. Thus, when facilitating interprofessional collaborative practice it is important to identify the core competencies that students would need to develop or adhere to when working in interprofessional teams. The identified core competencies for IPE are combinations of skills, knowledge and values/attitudes that are required when working across professions. Barr (1998) defined eight competences required to work collaboratively (Table 3.1). These were later redefined by the Canadian Interprofessional Health Collaborative (CIHC, 2010) into six competency domains (Table 3.1), followed by the Interprofessional Education Collaborative

Expert Panel (IECEP, 2011) summarising these domains into four (Table 3.1). For the purposes of this systematic review, the core competencies described by the CIHC were found to be most extensive and were used during the literature searches. This current review aims to assess and describe the intervention strategies used to develop and evaluate interprofessional core competencies in students.

Table 3.1: Core competencies for IPE

Barr (1998)	CIHC (2010)	ICCEP (2011)
Roles and responsibilities	Interprofessional communication	Values/Ethics for Interprofessional Practice
Recognise and show respect for others' roles, responsibilities, competence and constraints	Patient/client/family/community-centred care	Roles/Responsibilities
Ability to recognise and observe the constraints of one's own discipline	Role clarification	Interprofessional Communication
Being able to evaluate services, effect changes, improve standards, problem solve and resolve conflict during various interventions	Team functioning	Teams and Teamwork
The ability to assess, plan, provide and evaluate care with fellow professionals for individuals, and caregivers	5. Collaborative leadership	
Being able to endure limitations, differences, ambiguities, misinterpretations and autonomous changes in fellow professionals	6. Interprofessional conflict resolution	
The ability to enter into interdependent relationships, teaching and supporting other disciplines, learning and being sustained by them		
Being able to facilitate interprofessional case conferences, meetings, team working and networking		

3.3 Methods

3.3.1 Review Question

A specific, targeted review question was formulated identifying the population, intervention and outcomes that the review would evaluate (Khan et al., 2001). The PICO (Population, Intervention, Control and Outcomes) format is a widely known strategy that breaks down a research question into four components, facilitating the identification of relevant information on a specific topic (Aslam & Emmanuel, 2010). It was necessary for the population to include undergraduate students from the allied health sciences. The intervention (I) needed to be in the form of an interprofessional programme delivered over a period of time as part of a particular curriculum. The outcomes (O) of the study needed to incorporate elements of the six interprofessional core competencies as highlighted by the Canadian Interprofessional Health Collaborative (2010). The review question was thus: how are interprofessional interventions used to develop the core competencies amongst undergraduate allied health sciences' students?

3.3.2 Search Strategy

A comprehensive search was conducted in databases and specific journals such as Ebscohost (Academic Search Complete, ERIC), Directory of Open Access Journals (DOAJ), PubMed, PubMed Central, BioMed Central Journal, Science Direct and Journal of Interprofessional Care for the period 2005-2015. These sources were selected by the researchers because they were found to have the most references to interprofessional education at the time of the review. Manual searching of reference lists was undertaken and articles referred to the author by experts in the field were included. Search terms were constructed after a review of relevant literature and included terms such as core competencies for interprofessional collaborative practice (this phrase was used as a search item because many reviews have been done on IPE but not on IPE core competencies). Other terms included, interprofessional collaboration, and undergraduate health sciences students (such as: Dietetics, Occupational Therapy, Physiotherapy, Social Work, Natural Medicine, Sports Science, Nursing, Pharmacy, Dentistry and Oral Health).

3.3.3 Inclusion Criteria

Criteria for inclusion into the study were: (i) publications in the English language; (ii) publication dates between 2005 and 2015; (iii) qualitative studies; (iv) quantitative studies. Studies, which generally focused on IPE programmes, were considered but if they did not have development of core competencies as an outcome, they were excluded from this study.

3.3.4 Methods of the Review

Initially the search was conducted by GCF and the abstracts and titles were screened by the same researcher. The initial search yielded 2 519 articles for interprofessional collaboration. The second search included interprofessional core competencies, which yielded a total of 916 articles, which were used as the sample. The next phase was to remove all duplications and irrelevant articles from the data and a final sample of 16 studies was retrieved. Additional articles were added from expert sources (n=6) which was inclusive of the 16 studies identified. The citations for the 16 articles were retrieved and were independently read by GCF and JMF to determine if they could be included in the systematic review. A further eight articles were sourced from the reference lists of the articles. The titles and abstracts of the identified literature were screened by two independent reviewers, using the inclusion criteria as indicated in the next section. The full text of all potentially relevant articles was retrieved by one reviewer (GCF) and then screened by another reviewer (EM), using the same criteria in order to determine the eligibility of the papers for inclusion in the review. The second reviewer was given all the articles and, through data extraction, was able to verify those which met the criteria for the review. Both reviewers independently identified seven articles that met the inclusion criteria of the review at this stage. Inclusion into the final systematic review was based on the methodological quality of the study.

3.3.5 Methodological Quality Appraisal

The quality assessment of the articles was carried out using the data extraction and quality assessment form [Appendix I] (Glasgow et al., 2001 & Blackman et al., 2013). Each article was allocated a percentage out of 100. The rating score had three levels: weak ($\leq 30\%$); moderate (30-70%) and strong ($>70\%$) – Table 3.2. Studies were excluded if one component of the assessment was weak ($<30\%$) and if one of the interprofessional core competencies was not used as an outcome of the intervention. A narrative synthesis of the included studies was drawn up.

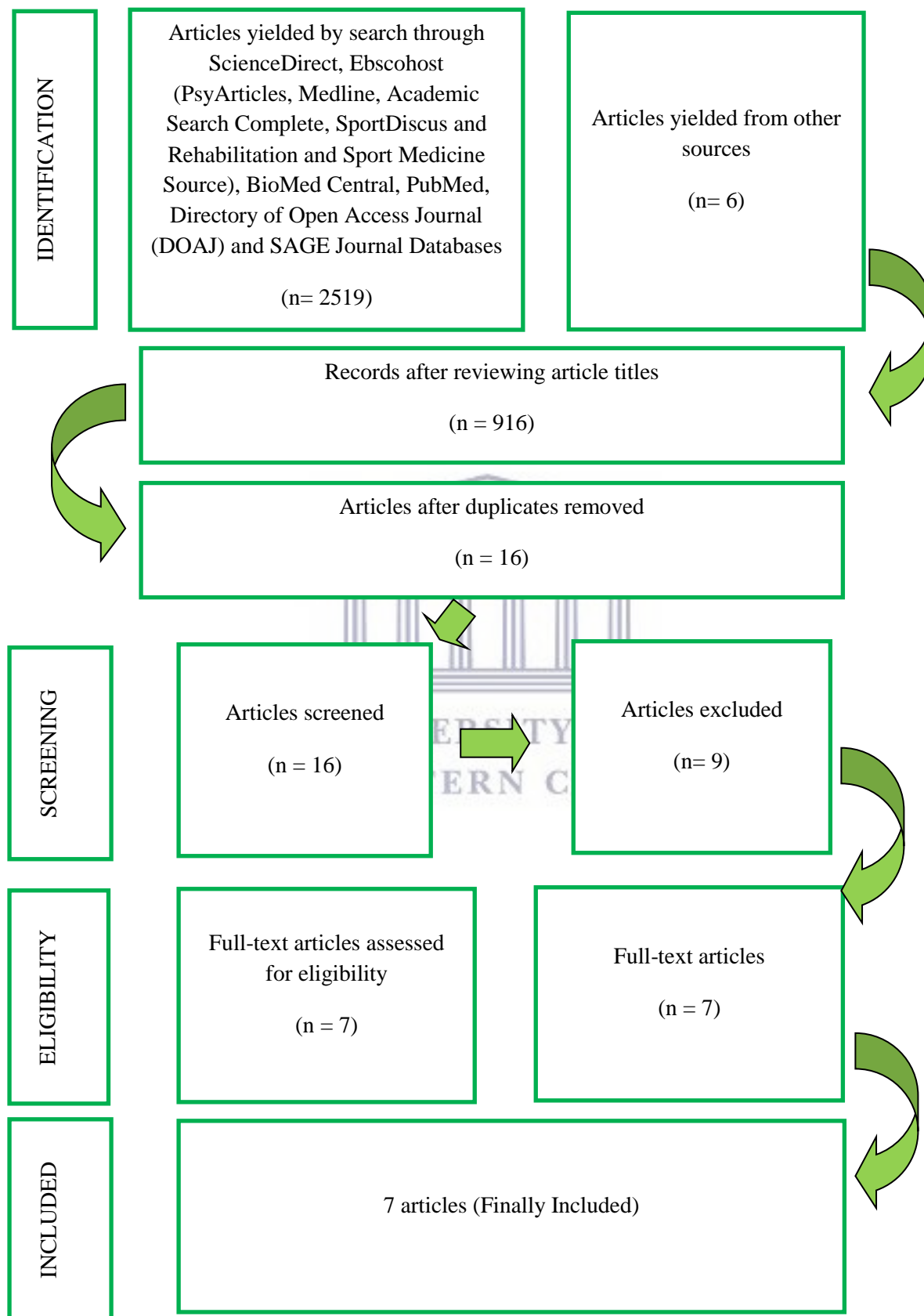
Table 3.2: Scoring sheet for the critical appraisal

Author	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Scoring
Bridges et al., 2011	1	1	0	1	0	1	0	1	0	1	1	1	0	1	0	60%
Van der Wielen et al., 2014	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	86%
Addy et al., 2015	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	80%
Irlich et al., 2015	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	80%
Huls et al., 2015	1	1	1	1	0	1	0	1	1	1	1	1	0	0	0	67%
Kim, 2015	1	0	1	1	1	1	1	0	1	1	0	0	0	0	0	53%
Nicely et al., 2015	1	0	0	1	0	1	0	1	0	1	0	1	1	0	0	47%

3.3.6 Data Extraction

A self-developed data extraction form was used to extract the data from the studies, using criteria that were determined prior to the data extraction phase (Appendix H). The data extraction form was designed to extract information such as author, country, population, health education topic, intervention aims for participants, outcomes and implications for peer education programmes (Table 3.3). Reviewers compared opinions and reached consensus on the final articles to be included in this review.

Figure 3.1: Review process





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Table 3.3: Data extraction form

Author	Country	Population	Health Education Topic	Intervention Aims For Participants	Outcomes	Implications For Peer Education Programs	Core Competencies
Bridges et al., 2011	United States of America	3 Universities: 480 first year students 3 500 students 2 300 students Disciplines: allopathic and podiatric medicine, clinical laboratory, medical radiation physic, nurse anaesthetists, pathologists' assistants, psychology, physician assistants, medicine, dentistry, pharmacy, nursing, physical therapy, clinical and health psychology, public health and health professions, nutrition graduate students, students of veterinary medicine	patient care, interpersonal and communication skills, and professional-ism, patient-centred care, with emphasis on team interaction, communication, service learning, evidence-based practice, and quality improvement Improve Health & Wellness among children	The 3 programmes have different components, ie. didactic sessions, service-learning & clinical components. The 3 components expect students to work collaboratively	The results show that students were able to work collaboratively on different tasks and at various levels.	The following aspects were highlighted for future programmes: administrative support, programmatic infrastructure, committed & experienced staff and acknowledgement of student effort.	Communication skills and team interaction

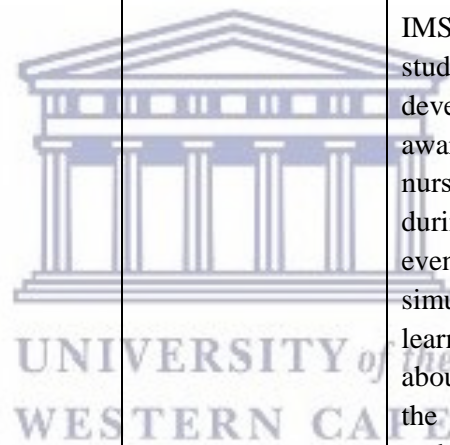
Van der Wielen et al., 2014	Virginia Commonwealth University, USA	8 health sciences students	A Case study by a student led group	To identify the understanding behind the motivation for developing a student group and the core benefits of group involvement.	Students can engage in interdisciplinary collaboration from a student-initiated approach and likely improve the care of future patients	Four core benefits of interdisciplinary collaboration and involvement developed: the development of knowledge and skills, interprofessional networks, professional competence, and role clarity.	Role clarification
Addy et al., 2015	Columbia	2013: 432 students & 32 staff members 2014: 504 students & 25 staff members	Social determinants of health and health disparities, health system improvement, patient safety, cultural competency, and ethics to address interprofessional education core competencies	Overarching goals of the course were to address the competency domains articulated by the IPE Collaborative: values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork	Improved understanding of public health and patient safety concepts and IPE competencies, as well as the importance of the social determinants of health and interprofessional collaboration.	Planning is underway to deliver an advanced IPE experience (including IPE simulation class opportunities, IPE internships, and enhanced IPE service learning opportunities) to students in the health professions.	Values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork
Irlich et al., 2015	Philadelphia	5 health professionals, 1 faculty member and 8-12 patients	Diabetes, hypertension, and dyslipidemia	Group medical hour-long visits with patients, Navigator-patient driven teams share	Through participation in the diabetes group medical visit (GMV), pharmacy	The GMV model is an -excellent method of delivering a collaborative healthcare experience to patients with a	

				challenges & successes & students	students have an opportunity to collaborate with an endocrinologist to create optimal therapeutic goals and treatment plans and participate in the facilitation of educational sessions with a behaviourist and an Advanced Practice Nurse. Students interact with other professions and engage interprofessional team members in shared patient-centred decision-making.	common chronic illness while providing self-management, education and peer motivation and support. Pharmacy student involvement in a GMV format as a component of pharmacy education, provides opportunities for collaboration among members of the healthcare team to improve patient outcomes. Interprofessional core competencies are incorporated in the Accreditation Council for Pharmacy Education (ACPE, 2016).	
Huls et al., 2015	Netherlands	68 students completed a worksheet and 19 students participated in a	Geriatric medicine in Nursing homes	How medical students perceived their learning in nursing homes and in-hospital geriatric service	According to the students, the nursing home differs from the hospital in three ways: (i)	Results suggest that geriatric medicine clerkships in nursing homes or in-hospital geriatric services might offer excellent opportunities for students to learn to care for older patients	Communication skills, role clarification

		focus group discussion			interprofessional collaboration is more prominent in the nursing home; (ii) low resources in nursing homes stimulate students to be creative, and (iii) students report that they are given more autonomy in nursing homes compared with the extensive educational guidance provided in hospitals.	and to develop general competencies, particularly regarding the roles that are less addressed in the traditional clinical clerkships, such as those of the communicator, the manager, the professional and the collaborator.	
Kim, 2015	Vancouver	Students	Student-run clinics deliver a combination of health promotion and social programmes, including harm reduction, counselling,	No specific topics but on a broad level, to provide services for marginalised and underserved populations	Student-run clinics offer an innovative IPE paradigm for development of interprofessional competencies.	Student-run clinics deliver an innovative education model and, provide a framework for developing IPE competencies. These clinics also increase social accountability by identifying the need for comprehensive health care in underserved communities facing	Team functioning, role clarity, interprofessional communication, and conflict resolution.

			childcare and literacy		Students who participate in running the clinics have the opportunity to utilise and improve their competencies in team functioning, role clarity, interprofessional communication, and conflict resolution.	significant barriers to health care access.	
Nicely et al., 2015	Ohio	Nursing students and students in the Department of Interactive Media Studies	Virtual reality simulation designed to reinforce concepts of disaster triage	Creation of a Virtual reality simulation enhanced student knowledge and skills in disaster nursing. This also affected students' attitudes about interprofessional communication and teamwork.	Collaborative development of the simulation resulted in a greater appreciation for interprofessional collaboration and communication, and working together fostered a sense of inquiry in both student groups. Nursing students gained a	This study is unique in that it reports not only on the impact of student interface within a virtual reality simulation, but discusses the learning acquired as a result of the simulation development process, also affecting student attitudes about interprofessional communication and teamwork.	interprofessional communication and teamwork

					<p>deeper appreciation of the technical skills involved in creating a virtual reality simulation as pieces of graphics, text, and audio sound bites were shared. The IMS students developed an awareness of the nurse's role during a disaster event, while simultaneously learning more about the steps of the triage process and disaster response.</p>		
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3.4 Results

Of the 16 articles, the reviewers identified seven articles that met the criteria for the review following methodological appraisal (Table 2). The excluded nine articles made no reference to interprofessional core competencies, did not focus on students and/or were reports that had no interventions attached to them. Articles included in the review included all information from the seven categories in the data extraction tool, which are author, country, population, health education topic, intervention aims for participants, outcomes and implications for peer education programmes.

When reflecting on the articles, the authors needed to consider the aims and objectives of the review, which were: To what extent do interprofessional programmes incorporate interprofessional core competencies as part of the outcomes among allied health students?

The article by Bridges, et al. (2011) describes three best practice models which were implemented for allied health students across different higher education institutions. The interprofessional competencies highlighted in these programmes were interprofessional communication; teamwork and identification of other health professions that could be of benefit to the client. Other competencies included, working with other health professionals to effect change in current practice; respect for the roles of others; collaboration with others to assess, plan, provide and review care; conflict-management skills; interprofessional leadership; identifying and overcoming barriers to interprofessional collaborative practice; and facilitation of interprofessional forums and seminars on topics of interest across professions (Bridges et al., 2011). Interprofessional core competencies were focussed on a collaborative approach to patient-centred care, with special emphasis on team interaction, communication, service learning, evidence-based practice, and quality improvement. The programme were based on three separate components, namely: a didactic component, a service-learning component, and a clinical component, through which competencies were instilled.

The van der Wielen, et al. (2014) article included students from health disciplines, including medicine, pharmacy and health services research, who formed the Inter Health Professionals Alliance (IHPA), an official student organisation to nurture interdisciplinary collaboration within their university. The ultimate goal of IHPA was to encourage collaboration among health professional students studying at Virginia Commonwealth University (VCU), with a specific focus on community engagement. The interprofessional core competencies highlighted

in this study were: the development of interprofessional knowledge and skills; the establishment of interprofessional networks; role clarity; and developing an appreciation and value of other health professional programmes in addition to an improved appreciation of communication, collaboration and teamwork to improve patient care (Van der Wielen et al., 2014). A student-led initiative by six health professional students led to the development of the Inter Health Professionals Alliance (IHPA) to address the gap in interdisciplinary training in their education. This forum identified four fundamental benefits of interdisciplinary collaboration, which included the development of knowledge and skills, professional networks, professional competence and role clarity. The main aim of IHPA was to encourage collaboration among health professional students with a focus on community engagement. Since this is a student initiative, there are no assessments attached to this initiative, which includes monthly outreach projects and discussions around topics.

The University of South Carolina implemented an introductory interprofessional course for more than 500 students from the disciplines of public health, social work, medicine, pharmacy and nursing. The course entailed three live class meetings and online coursework with a curriculum which entailed exploring concepts related to social determinants of health and health disparities, health system improvement, patient safety, cultural competency, and ethics to address interprofessional educational core competencies (Addy, Browne, Blake & Bailey, 2015). Although the core competencies by the IECCEP were adopted for this module, the competencies focussed on were: values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork. Students were required to complete an online end-of-course evaluation with items designed to address course objectives and specific course-content learning areas. This introductory course will continue, as there are plans to develop an advanced course as well at this institution. The long term effects of IPE were not reported on, although there were plans mentioned to develop advanced courses in IPE.

Irlich et al. (2015) highlight the Group Medical Visit (GMV) model from the Cooper University Hospital Urban Health Institute in Camden, New Jersey. The focus is on healthcare delivery to underserved patients with diabetes mellitus, whereby 8–12 patients are each scheduled for an hour-long visit. The healthcare team comprises an endocrinologist, a clinical pharmacy faculty member, an advanced practice nurse (APN), a licensed practical nurse (LPN), a medical assistant, and a behaviourist. These patients are then interviewed by an APN, an LPN, or a

clinical pharmacist (referred to as navigators) through a progression of questions relating to diabetes, hypertension, and dyslipidaemia which is captured within the electronic health record. Each member of the team has a specific role to play which is followed by the presentation of a health-related topic of a pre-planned curriculum of pharmacy students. Interprofessional core competency domains included in the curriculum are: values and ethics for interprofessional practice, to promote mutual respect and shared values, knowledge of one's own roles and responsibilities and those of other professions to appropriately address healthcare needs of patients, interprofessional communication, and teamwork (Irlich, Kaufman & Ganetsky, 2015). The programme is seen as effective in that it instills specific core competencies in the team. This initiative has since then been adopted by staff and the respective institutions and healthcare facilities. The programme will continue to be part of a module and will take place every year as part of student training. The long-term effects of the programmes on students were, however, not reported on. No assessment methods were mentioned.

Huls et al. (2015) describes a geriatric clerkship at the Radboud University Medical Centre in Nijmegen in the Netherlands. The authors argue that most learning takes place in clinical hospitals but at the same time nursing home environments can provide a suitable learning environment in which to gain competencies in geriatric medicine. The study reported that the nursing home differed from the hospital in three aspects: interprofessional learning and collaboration was more evident; the limited resources available in nursing homes stimulated students to be creative, and students reported having greater autonomy in nursing homes compared with hospitals, where more extensive educational supervision is provided (Huls, de Rooij, Diepstraten, Koopmans & Helmich, 2015). The study reached the intended target population, which were the students. It was effective in that it instilled specific core competencies (communication and role clarification) in students during a clerkship. This initiative has since then been adopted by staff, the respective institutions and placement site/s (hospital or nursing home). The programmes are part of the curriculum and take place during the students' sixth year of study where they have a mandatory geriatric placement. The study reports on perceived benefits and learning opportunities (specifically related to autonomy and social learning) through reflection with students. It is hoped that other learning institutions will adopt this approach throughout the Netherlands.

Kim (2015) states that interprofessional collaborative care has verified improved outcomes for patients, providers and the health care system in British Columbia, which indicates the need

for advancing interprofessional education. One such student-driven initiative for service-learning are student-run clinics (SRCs), the concept of which lends itself to developing specific interprofessional core competencies such as: team functioning, role clarity, interprofessional communication, and conflict resolution (Kim, 2015). The study reached the intended target population, which were the students. It was effective in that it instilled certain core competencies in students through student-run clinics (SRCs). These programmes have been adopted by staff and by their respective institutions, although the authors report that there is no evidence that SRCs effectively develop IPE competencies. The programmes are part of the curriculum and take place every year even though there are currently very few SRCs in Canada. The long-term effects of the programmes on students were, however, not reported but are definitely seen as a vehicle for meaningful IPE experiences for students.

Nicely and Fara (2015) report on senior level nursing students who collaborated with interactive media studies (IMS) students with the aim of designing a virtual reality simulation in a module for disaster management and triage techniques (Nicely & Fara, 2015). This module was carried out over a five-week period and students used Google Docs, Google Groups, and Google Hangouts to remain in contact with each other outside of classroom times. An open-ended survey questionnaire was administered at the end of the module and it was found that responses were strongly positive to interprofessional education, teamwork, and simulation as learning modalities. The study reached the intended target population which were the students. It was effective in that it instilled specific core competencies in students through virtual reality simulation (VRS). These programmes have been adopted by staff at their respective institutions and will continue to take place as part of their curriculum. The long-term effects of the programmes on students were not reported on as VRS is seen as an emerging teaching methodology.

3.5 Discussion

This review has systematically identified global interventions that specifically focus on instilling interprofessional core competencies. It is evident from the literature that several interprofessional interventions have been proposed but very few specifically focus on promoting interprofessional core competencies. The discussion will cover three key areas that emerged during the review below: the IPE context, core competencies addressed using various strategies and assessment strategies.

3.5.1 IPE Context

Bridges et al. (2015) describe the IPE and collaboration training curriculum of three universities, the Rosalind Franklin University of Medicine and Science, the University of Florida and the University of Washington. The proposed models have different aspects with respective learning outcomes. These components are: a didactic programme, a community-based experience and an interprofessional-simulation experience. The three institutions describe faculty-led initiatives that include common elements and the outcomes from these initiatives have led to successful IPE experiences for students. Lessons learnt from these IPE initiatives include opportunities for students to experience, share and practise elements of responsibility, accountability, coordination, communication, co-operation, assertiveness, autonomy and mutual trust and respect. In the second article, Virginia Commonwealth University describes a student-led initiative to address the gap in their training by forming the Inter-Health Professionals' Alliance (IHPA). The IHPA hosts community-based health outreach projects and campus-based activities that expose students to an assortment of issues related to the various health disciplines (van der Wielen et al., 2014). This can be advantageous as the initiative comes from the students in this instance, which is a reflection of their commitment to their learning needs. Students will automatically put in more effort if they are in control of their learning. Addy et al. (2015) describes another faculty-led initiative whereby the University of South Carolina (USC) established an interprofessional education committee. This committee was mandated to facilitate and provide IPE learning and service-learning opportunities to students from more than 20 schools and colleges. This top-down approach is another method of implementing IPE initiatives, ensuring maximum participation from all faculties, departments and schools. With a directive from a formalised body, in this case a committee, it leaves little room for non-participation from staff and students. The Cooper University Hospital Urban Health Institute in Camden, New Jersey, uses Group Medical Visits (GMVs), as another faculty-led initiative whereby a clinical team sees eight to twelve patients/clients for an hour-long visit to help them manage their diabetes mellitus. The team constitutes an endocrinologist, a clinical pharmacy faculty member, an advanced practice nurse (APN), a licensed practical nurse (LPN), a medical assistant, and a behaviourist (Irlich et al., 2015). This model is different to the above models whereby a university partners with service providers in the field for a collaborative practice experience. This experience can be seen as modelling the desired method of healthcare delivery in an interprofessional manner. Huls et al. (2015) describe one of the eight medical schools, viz. the Radboud University Medical Centre

Nijmegen, that offers a compulsory practical component in geriatric medicine. This geriatric practical component at the Radboud University Medical Centre Nijmegen is facilitated by fifteen diverse nursing homes and nine hospitals established in the southeast of the Netherlands, where another faculty-led initiative is described in a specific setting linked to a practical component of the curriculum. This IPE experience is incorporated into the learning outcomes of a specific curriculum which ensures 100% participation of students. The fifth example is a student-led initiative whereby students gain valuable skills in student-run clinics (SRCs) in British Columbia, providing ideal opportunities for IPE among health care professional students with a large percentage of ageing residents. These SRCs are based at community health centres and provide services for the underprivileged (Kim, 2015). It is not clear if the SRCs count towards clinical hours or learning outcomes but the actual opportunity provided is ideal for gaining practical skills in a real-life setting. It is also not clear what faculty involvement there is in these SRCs. Nicely and Fara (2015) reported on a faculty-led initiative where senior level nursing students collaborated with interactive media studies (IMS) students with the aim of designing a virtual reality simulation in a module for disaster management and triage techniques in Ohio. It is clear from the literature that both student-led and faculty-led initiatives for IPE learning experiences are advantageous to students. A variety of learning opportunities allows for more competencies to be instilled into students.

3.5.2 Core Competencies Addressed using Various Strategies

At the three universities that Bridges et al. (2015) highlight, the didactic programme has a specific focus on interprofessional team building skills, knowledge of professions, patient-centred care, service-learning, the influence of culture on healthcare delivery and an interprofessional clinical element. The second component, the community-based experience, validates how interprofessional collaborations afford service to patients and how the environment and availability of resources impact on one's health status. The interprofessional-simulation experience defines clinical team skills training in both formative and summative simulations used to cultivate skills in communication and leadership. The IHPA from the Virginia Commonwealth University identified four competency domains that were lacking from their current educational curriculum, including the development of knowledge and skills, professional networks, professional competence and role clarity (van der Wielen et al., 2014). Addy et al. (2015) describe the core competencies focussed on by USC: values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams

and teamwork. The clinical teams associated with the Cooper University Hospital Urban Health Institute in Camden, New Jersey, ascribe to the Core Competencies for Inter-professional Collaborative Practice, from the Interprofessional Education Collaborative, as cited in the Accreditation Council for Pharmacy Education (ACPE) standards. These domains are values and ethics for interprofessional practice to promote mutual respect and shared values, knowledge of one's own roles and responsibilities and those of other professions, to address healthcare needs of patients in the appropriate manner, interprofessional communication and teamwork (Irlich et al., 2015). Huls et al. (2015) mention two main competencies that were prominent in the geriatric practical aspect: viz. communication skills and interprofessional collaboration (teamwork) skills. Students participating in the SRCs have the opportunity to improve their competencies in team functioning, role clarity, interprofessional communication and conflict resolution, according to Kim (2015). Nicely and Fara (2015) report on the competency domains of interprofessional collaboration and communication which are fostered through didactic learning and clinical skills.

3.5.3 Assessment Strategies

Rosalind Franklin University of Medicine and Science's modules has two one credit, one hour pass/fail modules for their IPE programmes. The University of Florida's Interdisciplinary Family Health course is part of a bigger course in terms of grading and credits. In order to receive a pass score, students from the University of Washington participate in training simulations and demonstrate acceptable performance in the summative assessment simulation (Bridges, et al., 2011). The IPE initiatives at the Virginia Commonwealth University was student-driven to bridge the gap in their curriculum and therefore none of the activities had an assessment attached to it (van der Wielen et al., 2014). The University of South Carolina (USC) introduced a foundation IPE class as an elective module for students. No assessment strategies were mentioned in the research study, but students were asked to complete an online end-of-course evaluation in alignment with the course objectives and specific course content (Addy, et al., 2015). The Cooper University Hospital Urban Health Institute in Camden, New Jersey, makes use of Group Medical Visits (GMVs) whereby their students form part of medical teams to gain practical experience. No assessment strategies were discussed in this paper as the focus was on the structure of the IPE experience (Irlich et al., 2015). The geriatric practical component at the Radboud University Medical Centre Nijmegen study explores what students perceive as the main learning outcomes in a hospital or a nursing home, and explicitly addresses

factors that may stimulate or hamper the learning process. Therefore no assessment strategies were mentioned in this study as the focus was on the learning process (Huls et al., 2015). In British Columbia another student-driven community service initiative is emerging that enhances IPE. This initiative is student-run clinics under the supervision of health professionals providing health services to the underprivileged communities. The paper describes this initiative, and no assessment strategies were discussed (Kim, 2015). At two universities in Ohio, the nursing students and students in the Department of Interactive Media Studies collaborated on a joint module and made use of summative assessments and course examinations to assess comprehension of course content, as well as to enhance IPE core competencies (Nicely & Fara, 2015).

No studies have been done in South Africa. From the review it is clear that although the interventions were found to be methodologically rigorous, when they were systematically reviewed for their strengths and weaknesses they were found to have limitations. Some of the main limitations identified were that not all interprofessional core competencies described by the CIHC were incorporated into programmes. These core competencies have also not been widely accepted by the advocates of interprofessional education; not all the programmes implemented were credit bearing; there appeared to be a general lack of administrative support; widespread buy-in from academics across institutions; acknowledgement of student participation in new and innovative interprofessional programmes; a lack of committed staff and budgetary constraints.

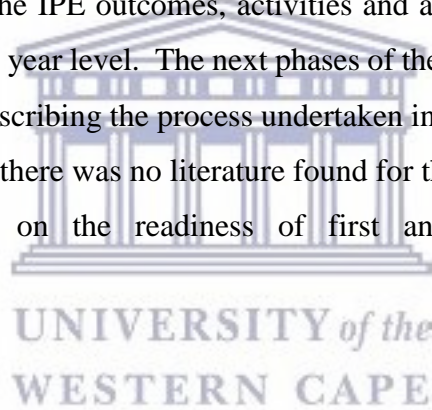
As this is a developing field in academia, when evaluating the effects of the intervention it is evident that there is a lack of studies in the literature. In addition, when reporting on the intervention, it is important that follow-up information is provided in order to be able to measure future adoption and maintenance of intervention programmes. This will assist future researchers in understanding whether interventions have impacted on behavioural change, which one should be able to see in practice, ultimately resulting in a transformation of the health system.

3.6 Conclusion and Implications for Practice

The aim of this review was to assess and describe the intervention strategies used to develop and evaluate interprofessional core competencies in students. Overall, the articles that formed

part of the review mention various types of activity to instill interprofessional core competencies. These activities include: IPE classroom simulations, IPE internships, service learning opportunities, student-run clinics and IPE clinical practice. The gaps in these articles reflect that these activities are not linked to a framework that would guide the understanding of IPE development over the continuum of learning, and that these activities appear to be initiatives from faculty champions. Only Irlich, Kaufman and Ganetsky (2015) use the term ‘model’ to describe the group medical visits as the framework for the IPE initiative.

In addition, most of the articles have no assessment strategies attached to their IPE initiatives and only two institutions made mention of obtaining a ‘pass’ through participation in training simulation through demonstration of acceptable performance in a summative assessment. Another institution included summative assessments and course examinations to assess comprehension of course content. This review emphasises the need for a clear curriculum framework which highlights the IPE outcomes, activities and assessments in alignment with IPE core competencies at each year level. The next phases of the study will attempt to address the gaps in the literature by describing the process undertaken in developing an IPE model for a South African university, as there was no literature found for this context. The next phase of the research study focuses on the readiness of first and senior-level students for interprofessional learning.



CHAPTER 4

PHASE 2: UNDERSTAND- SURVEY

4 READINESS FOR INTERPROFESSIONAL LEARNING

4.1 Introduction

During this phase of the study the researcher aimed to appraise the students' readiness for interprofessional learning. Chapter Four endeavours to determine the readiness of students for interprofessional learning, and describes the specific methodology that was followed in order to collect and analyse the data gathered, the results of the data collection and, finally, a discussion of the results.

4.2 Background

Many current qualitative research studies have featured the significance of interprofessional practice and education (Honan, Fahs, Talwalkar & Kayingo, 2015; Furness, Armitage & Pitt, 2012). Based on the core competencies of interprofessional practice, research has highlighted how enhancing these competencies can improve patient outcomes (Baggs, Schmitt, Mushlin, Mitchell, Eldredge, Oakes & Hutson, 1999; Puntillo & McAdam, 2006). According to Furness, Armitage and Pitt (2012), improving communication and understanding of professional roles can result in less errors in patient care (Furness, Armitage & Pitt, 2012). They 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.

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. 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 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). In light of its importance, 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 (Interprofessional Educational Collaborative, 2011; Greer, Clay, Blue, Evans & Garr, 2014).

Many barriers have been described in the literature that hinder the implementation of successful IPE programmes. They include structural and organisational conflicts related to programme length and size, institutional support, geographic separation, faculty expertise, scheduling conflicts and varied assessment methods and learning needs (Honan, Fahs, Talwalkar & Kayingo, 2015; Furness, Armitage & Pitt, 2012; Hammick, Freeth, Koppel, Reeves & Barr, 2007; Horsburgh, Lamdin & Williamson, 2001). On the other hand, discrepancies in student attitudes towards IPE may be the leading barrier. While a number of factors influence the effective implementation of IPE, baseline student attitudes are among the most significant factors influencing positive outcomes. These baseline attitudes can be grounded in an assortment of factors, including age, work experience and gender. Furness, Armitage and Pitt (2012) emphasise that merely bringing together students from diverse backgrounds and training programmes is insufficient to overcome pre-existing attitudinal barriers when considering the mixed success of past interventions. Parsell and Bligh (1999) emphasise that it is becoming more and more important for educators to have an understanding of student attitudes towards IPE prior to curricular design, and to take into account the differences in values and beliefs of students. Van der Wielen, Do, Diallo, LaCoe, Nguyen, Parikh et al. (2014) claim that very little is known about readiness for and attitudes towards IPE among healthcare professional students at the start of their training.

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, Stalmeijer, Widyandana and Scherpbier (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. Al-Eisa et al. (2016) indicate in their study the readiness of undergraduate healthcare students

for IPE and emphasise the need to implement shared learning. In a study conducted in 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. 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, and final year students who have been exposed to interprofessional learning opportunities.

4.3 Methodology

4.3.1 Context of IPE at UWC

Teaching modules in the Faculty of Community and Health Sciences at UWC, where health professionals are trained, tend to be discipline-specific and thus taught in isolation of each other. This has resulted in health professionals having little knowledge of the role of other disciplines. UWC then made a conscious decision in 1999 to embrace the ideology of the Primary Health Care approach that emphasises that a team of health workers and community members plan and carry out programmes together. 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 the first-year interdisciplinary modules, which aimed at providing students with a solid foundation in the interdisciplinary approach. All students entering the Faculties of Community and Health Sciences (FCHS) and Dentistry undertook common first-year courses that highlighted interdisciplinarity. The first year course now includes community-oriented learning from the start, with exposure of students to health and social problems of communities at the primary care level. 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 interdisciplinary community-based practice experience becomes one of sharing sites for multi-disciplinary 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 Faculties of Community and Health Sciences (FCHS) and Dentistry. The courses are compulsory for all health science students and serve as a foundation for all other

interdisciplinary courses which are offered in the second, third and fourth year of training (Filies & Waggie, 2016).

4.3.2 Study Population and Sample

Population

The study population consisted of first and senior year level students registered for the 2015 and 2016 academic year. 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.

Sampling

Convenient sampling was used for students' participating in this aspect of the study (Appendix D). The number of first year students (n=295) and senior students (n=281) who completed the questionnaire and made up the sample for the study, was 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).

4.3.3 Design

Survey research was selected as the most appropriate design for this part of the study, as outlined in Chapter 2, because it allows the researcher to describe or explain features of a very large group or groups. 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 using time-intensive methods such as in-depth interviews or field research (Aliaga & Gunderson, 2002).

4.3.4 Data collection tools

A 15-item Likert scale, Readiness for Interprofessional Learning Scale (RIPLS) (see Appendix G), adapted from Parsell and Bligh (1999) (1, strongly disagree to 5, strongly agree) was used in this study to assess attitudes towards interprofessional education. The RIPLS questionnaire was confirmed to be valid and reliable and able to be used to assess interprofessional readiness (Parsell & Bligh, 1999).

4.3.4.1 Description of the principal factors of the RIPLS questionnaire

a) Team-work and collaboration

The statements in this subscale signify a strong belief that learning together is valuable in a number of ways. Six of these items are concerned with the attainment and usefulness of team-working skills and three statements with the need for constructive relationships between professionals and other health care students. They can be grouped into two clusters: effective team-working and relationships with other professionals. The strongest statement in the group is 'Learning with other health care students will help me become a more effective member of a health care team'. The second strongest statement is 'Patients would ultimately benefit if health care students worked together to solve patient problems', followed by 'Shared learning with other health care students will increase my ability to understand clinical problems', and 'Communication skills should be learned with other health care students'. The fifth statement making up the subscale is 'Team-working skills are essential for all health care students to learn' followed by 'Shared learning will help me to understand my own limitations'. The second cluster's statements (Relationships with other professionals) in order of strength are 'Learning with health care students before qualification would improve relationships after qualification', 'Shared learning will help me to think positively about other professionals' and 'For small-group learning to be successful, students need to trust and respect each other'.

b) Professional identity

Seven statements contribute to the second subscale, which relate to both positive and negative features of professional identity. These can be clustered into two groups: negative professional identity and positive professional identity. The negative cluster is dominated by two items; the first is 'I don't want to waste my time learning with other health care students' and 'It is not necessary for undergraduate health care students to learn together'. The third item is 'Clinical problem-solving skills can only be learned with students from my own department'. The second cluster under this subscale is loaded with positive statements, which are 'Shared learning will help me communicate better with patients and other professionals', 'I would welcome the opportunity to work on small-group projects with other health care students'. 'Shared learning will help to clarify the nature of patient problems' and 'Shared learning before qualification will help me to become a better team-worker'.

c) Roles and responsibilities

There are three statements in this cluster. The first is 'The function of nurses and doctors is mainly to provide support for doctors'; this is followed by the negatively loaded statement 'I'm not sure what my professional role will be'. The last statement in this cluster is 'I have to acquire much more knowledge and skill than other health care students'.

4.3.5 Data Collection Process

4.3.5.1 Piloting

The research instrument (RIPLS) was piloted with one of the thirteen classes participating in the interdisciplinary module.

4.3.5.2 Administration process

The researcher met with all facilitators of the interdisciplinary 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 to all students. It was decided that the researcher would meet with all facilitators in their next weekly meeting before the start of their classes to train the facilitators on how to administer the questionnaire and to become familiar with the instrument. Facilitators would also have 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 interdisciplinary 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.

4.3.6 Analysis

Data from the RIPLS was captured and analysed by Statistical Package for the Social Sciences (SPSS) software. According to Muijs (2004), SPSS is, in all probability, the most common statistical data analysis software package used in educational research and is available at most higher education institutions. It is relatively user-friendly and extremely flexible in terms of the desired results required from an assortment of research studies. This does not necessarily

mean that it is the best or the only software package, but SPSS is by far the most commonly used statistical data analysis software. It is a Windows-based programme, and shares many features with other Windows-based software. The RIPLS questionnaire in this research study was further analysed by exploratory and inferential data analyses which will be explained below.

4.3.6.1 Exploratory data analysis

Cox (2017) claim that exploratory (descriptive) data analysis attempts to recognise the key features of a data set of interest and generates concepts for further study. When compared to confirmatory (inferential) data analysis, the focus is more on model specification, parameter estimation, hypothesis testing and firm decisions about the data set. Exploratory data analysis further attempts to examine and exhibit observed data in a fairly straight-forward manner, which does not require the obligation of a prior model or hypothesis. Tukey (1977) emphasises that a distinction between descriptive and inferential statistics is essential. The following components of exploratory data analysis were used:

- a) Descriptive statistics: Hebl (2014) explains descriptive statistics as numbers that are used to summarise and describe research information. The word "data" is used for this research information, which could have been collected from experiments, surveys, interviews, focus groups, historical records, etc.
- b) Data visualisation: Data was presented in a visual form (e.g., table form) to highlight and communicate the findings of the research.
- c) Central tendency: Within the table, the average or most typical values were indicated to show the distribution. The most common measures of central tendency were indicated through the median and the mode.

4.3.6.2 Inferential data analysis

Inferential data analyses are techniques for making generalisations about features of a population, based on a sample, e.g. Correlation, t-test, Chi square, ANOVA (Tukey, 1977). With regard to the 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. Within the T-test analysis, statistical significance is reported on as well as correlation:

- a) **Statistical significance:** Statistical significance signifies the results of some statistical test that is being executed. The statistical test varies depending on the levels of measurement of the variables, and the objective of the research or hypothesis. There are several different tests but they all have some similarities and contain the following: i) **One Null Hypothesis:** The null hypothesis typically states that there is no relationship between the variables being tested. The null hypothesis is already determined and grounded in the method being used. Most null hypotheses state that one statistic or number is equivalent to another statistic or number. ii) **One Alternative Hypothesis:** The alternative hypothesis usually states that two or more variables are somehow related. Like the null hypothesis, the alternative hypothesis has already been determined, based on the method being used. The alternative hypothesis is the opposite of the null hypothesis and usually states that one statistic or number is not equal to another statistic or number.
- b) **Correlation:** Correlations tell the researcher if the variables are connected and also the direction and strength of the association. Correlations only range from -1 to 1. A correlation of 0 implies that the variables are not related. A positive correlation specifies a positive association (an increase in one variable leads to an increase in another variable), while a negative correlation specifies a negative association (an increase in one variable leads to a decrease in another variable). The closer a correlation is to -1 or 1 the stronger is the association between the variables.

Table 4.3 shows descriptive statistics of the readiness for interprofessional learning for the total sample, first and senior-year level students. Levene's test was used to determine the homogeneity of variance in the analysis of the survey in the study. When significance levels were less than 0.05, the two groups were not equal in terms of variances and when the significance levels were more than 0.05, the two groups were considered equal in terms of variances. In a case where assumptions of homogeneity of variance were violated, it meant that there were unequal variances and the value used was for 'equal variances not assumed'. When assumptions of homogeneity of variance were met, there were equal variances and the value used was for 'equal variances assumed'. With regards to this research study, descriptive statistics (frequency distribution) and percentages were used to summarise demographic information and attitudes towards interprofessional learning.

4.4 Results

4.4.1 Demographic Information

The results in Table 4.1 show that 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.

Table 4.1: Demographic information of students

	No. of 1 st year students per discipline		No. of senior students per discipline		Gender distribution of participants			
	Frequency	Percent	Frequency	Percent	1 st year students		Senior students	
					Female	Male	Female	Male
Dent	32	10.8	-	-	27	5	-	-
Diet	8	2.7	40	14.2	6	2	33	7
Nurs	61	20.7	47	16.7	45	16	12	35
OccTh	17	5.8	56	19.9	15	2	53	3
OralH	10	3.4	-	-	8	2	-	-
Pharm	40	13.6	21	7.4	25	14	17	4
Physio	20	6.8	36	13.1	16	4	25	11
SoNM	14	4.7	-	-	4	10	-	-
SRES	15	5.1	27	9.6	10	5	13	14
SW	32	10.8	54	19.1	3	28	45	9
Total	295	100.0	281	100.0	216 (74%)	74 (26%)	198 (71%)	83 (29%)

4.4.2 Results of the Readiness for Interprofessional Learning Survey (RIPLS)

Two variables were used to determine significance in the RIPL survey - gender and disciplines. Readiness for Interprofessional Learning scores indicate that students are 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 4.2 below indicates that both student groups understand 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.

Table 4.2: RIPL subscales and scores

Teamwork and collaboration					
Participants	N	Minimum	Maximum	Mean	Std. Deviation
First year level	287	2.33	5.00	4.3546	.41907
Senior year level	277	2.89	5.00	4.5086	.39281
Negative and positive professional identity					
Negative first- year level identity	288	1.00	5.00	3.8472	.74497
Positive first-year level identity	290	1.00	5.00	3.9460	.65778
Negative senior-year level identity	280	1.00	5.00	3.9952	.73322
Positive senior- year level identity	277	2.00	5.00	4.1432	.61968
Roles and responsibilities					
First-year level	287	1.00	4.67	3.1626	.56432
Senior-year level	281	1.33	5.00	3.1922	.58507

With regard to significant differences in specific disciplines from first to senior-level students, scores again indicated that students are 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 4.3 below.

Table 4.3: Comparison of Readiness for Interprofessional Learning from First Year Students and Senior Level Students

Scales	Total Sample		1 st 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

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 was 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.

4.5 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 other them. . Numerous studies have observed that health science students are inclined to report positive attitudes towards interprofessional education in general (Tunstall-Pedoe et al., 2003; Pollard et al., 2004). There are many definitions of the term ‘attitude’ but in general it is defined by Eagly, Mladinic, and Otto (1994) as an overall evaluation towards a specific target. The target in this case is interprofessional learning. It is usually understood that an attitude includes three distinct

components: cognitive, affective and behavioural (Rosenberg & Hovland, 1960). 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 positive affect, having the 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' willingness to continue learning together throughout their professional training (Anderson & Thorpe, 2008; Horsburgh, Lamkin & Williamson, 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 & Thorpe, 2008). Considering the significance of attitudes toward 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 toward IPE. Curran, Sharpe, Forristall and Flynn (2008) state that health professional students should be exposed to positive role modelling throughout their education, which in turn develops values for interprofessional collaboration. In terms of 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, Lamdin & Williamson, 2001). Poldre (1998) supports this initial focus on teamwork and reports that barriers to teamwork include a lack of knowledge about the roles of different health professionals. Horsburgh, Lamdin and Williamson (2001), on the other hand, state that literature is not clear on when the introduction to different professional roles would be most useful. Harden (1998) provides some guidance by stating that an approach should be adopted which will be most appropriate for the stage of learning at which the students are.

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 and that interprofessional groups should include both genders. Another reason offered for the gender differences are that men appear to be socialized into being more technically competent, while women are socialized to be more respectful and humane (Kerssens, Bensing & Andela, 1997). 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 exclusive to 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 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. Hertweck, Hawkins, Bednarek, Goreczny, Schreiber and Sterrett (2012) offer an explanation for this finding by stating that these students are educated in the medical model. They further explain that possibly some students are attracted to the physician who influences their opinion on the value of working with other health care professions' students on a team. Tanaka and Yakode (2005), in addition, found that medical students were significantly less positive toward 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 relation 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 was necessary to design additional learning opportunities for nursing students to foster a more positive attitude to teamwork and collaboration. It was 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 attitude rather than behaviour, and is by no means a measure of interprofessional practice, and 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 show no significance with regard to roles and responsibilities in both student groups. There is 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, it is beneficial to patient care and possibly could enhance working relationships.

4.6 Conclusion

It is evident from the discoveries 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 & Rhoda, 2017) to interprofessional learning is therefore a vital consideration in determining the correct timing to learn about the different professional roles. Other authors advise that learning about different professional roles should be introduced only when students can participate in joint clinical practice or at a postgraduate level (Harden, 1998). 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. The next phase in the research study will describe the process undertaken to determine the most appropriate activities and assessment practices in this regard in consultation with a panel of experts.

CHAPTER 5

PHASE 3 – DEFINE

5 DELPHI STUDY

5.1 Introduction

Chapter Five outlines the defined phase of the study. During this phase a Delphi study was used to reach consensus on the most appropriate activities to use in an interprofessional curriculum that would assist in instilling interprofessional core competencies in allied health students, together with the applicable evaluation methods. The following sections will be discussed in this chapter: background to the study, methodology, results from round one and two, discussion of the findings and conclusions.

5.2 Background to the study

The overall objective of any health professional curriculum is to ensure that the knowledge, skills and attitudes of the students are influenced by the curriculum and to instil these attributes into the students to help them become capable, compassionate and inquisitive health professionals. McKean, Budnitz, Dressler, Amin and Pistoria (2006) highlight the need for medical educators to align their learning objectives with the core competencies if we are to ensure that the students achieve a degree of competency. Currently, in interprofessional education, it is not always clear which activities may be used to facilitate the development of interprofessional core competencies. However, it is our understanding that, if health professional students are exposed to the interprofessional core competencies effectively, it may result in health care professionals who have an improved understanding of interprofessional practice, thus improving practice within their specific disciplines.

Competencies are being used gradually by many professions to comprehensively describe ideas such as interprofessional collaboration (Wood, Flavell, Vanstolk, Bainbridge & Nasmith, 2009). A good example is the Royal College of Physicians and Surgeons' CanMEDS competency framework which has been embraced or modified by disciplines such as nurses, chiropractors, paramedics, physician assistants, family physicians and veterinarians. The College of Health Disciplines (CHD) at the University of British Columbia (UBC), identified a need for a commonly set of interprofessional competencies as a method to integrate IPE into

their present health professional curricula. The process that the CHD followed was to review the educational literature associated with competency-based education and existing competency frameworks. They then consulted with curriculum developers to identify a specific process as a method to comprehensively inform curricula on the integration of interprofessional education. Wood, Flavell, Vanstolk, Bainbridge and Nasmith (2009) state that the development of a comprehensively appropriate interprofessional competency framework is the first step in this process. Using this framework as a foundation, the CHD compared and contrasted current interprofessional, discipline-specific and core competency frameworks from across the world. Discussions with the curriculum and IPE experts resulted in the development of a final draft of a Competency Framework for Interprofessional Collaboration. This framework was designed to inform curriculum development at the University of British Columbia for health and human service professionals throughout the continuum of learning, from undergraduate level to continuing professional development. As related to this study, the panel of experts, through a Delphi study, assisted in the development of an IPE model which informed curriculum development at the University of the Western Cape.

In order to meet the needs identified in the curriculum development, this study used a Delphi approach to identify teaching strategies that aim to develop interprofessional competencies in undergraduate healthcare students. The study is significant in that it goes beyond not only identifying teaching strategies, but also looks at assessment strategies that could be used. These strategies could, in turn, form a crucial aspect in developing the IPE model.

5.3 Methodology

5.3.1 Research Design

The Delphi method is a research design that usually involves approximately three rounds of surveys that are distributed to a panel of experts, with each round being informed by responses to the previous one. The Delphi process can be continuously repeated until consensus is reached. In this study the Delphi method was used to reach consensus on the most appropriate activities and assessment methods to use in an interprofessional curriculum that would assist in instilling interprofessional core competencies in allied health students. The opportunity was also used to gain additional information from the panel of experts on guiding principles for IPE curriculum design, as well as their viewpoints on additional IPE core competencies as professed in the literature.

5.3.2 Panel Participants

Selection of the appropriate participants is regarded as one of the most important phases in the entire Delphi process as it directly impacts on the quality of the results produced (Judd, 1972; Taylor & Judd, 1989; Jacobs, 1996). Since the Delphi technique concentrates on prompting expert views over a short period of time, the selection of participants is usually reliant on the disciplinary areas of knowledge and skills required by the specific issue at hand (Hsu & Sandford, 2007). As interprofessional education is a relatively developing area in South Africa, it was initially difficult to identify local experts in the field. The researcher had to identify between 15 and 20 participants and names were garnered from the initial experts identified, so to include as diverse a group of experts as possible. Following this process, the participants made up the group of 29 participants. The experts in this group came from various organisations, both local and international. International organisations included: the Centre for the Advancement of Interprofessional Education (CAIPE) in the United Kingdom; the University of Missouri; the Suez Canal University; the University of Cairo; the University of North Carolina; the University of North Texas; Curtin University in Australia; the University for Development Studies in Ghana; and the University of Sudan. South African institutions included Stellenbosch University (SU); the University of the Western Cape (UWC); the University of Cape Town (UCT); the University of Pretoria; the University of Kwazulu Natal; the University of the Free State; and Psych Care in Pietermaritzburg.

5.3.3 Procedure

All the identified participants and experts in the field of Interprofessional Education (IPE) received an invitation letter via email containing information regarding the current Ph.D. study and a request for their assistance as an expert in the field of IPE (Appendix B). A consent form was attached to the email, which needed to be completed and returned to the researcher, should they agree to participate in the study. Once all the consent forms were received, the participants were sent a link to begin the Delphi process by completing an online questionnaire in Google Forms. The first section of the questionnaire included a demographic aspect whereby participants had to indicate their discipline, years of experience in IPE, year level of student engagement in IPE and the average number of students engaged in IPE per annum. The Psychology Ethics Committee of the University of Aberdeen (PEC, 2014) posits that it is normal practice to assign a numerical reference to participants in research studies for the purposes of anonymity. It was particularly necessary in this study to track participants' replies

in order to verify their responses during the next round of the Delphi study. The questionnaire was based on the six interprofessional core competencies identified by the Canadian Interprofessional Health Collaborative (CIHC, 2010) whereby participants were asked to identify activities and methods of evaluation for each competency domain. Participants were asked at the end of the questionnaire to identify any additional competencies that should be added to the list. The questionnaire was sent online, which allowed participants to complete it at a time and space in which they were comfortable. The researcher enabled settings in Google Forms to be notified via email when questionnaires were completed by participants according to their allocated participant number and, by this method, the panel of experts could keep track of the total number of completed questionnaires.

Prior to the Delphi Study, the researcher presented the two (CIHC, 2010 & Interprofessional Education Collaborative Expert Panel, 2011) competency documents to faculty who collectively decided to use the six competency domains outlined by CIHC (2010). The participants in the Delphi Study had to review the combined six competencies listed by CIHC (2010) and the two additional competencies suggested by an Interprofessional Education Collaborative Expert Panel (2011), and to list any other competencies as additional information for the researcher. For the purposes of this study, the focus is primarily on the six competencies listed by CIHC (2010), together with the additional core competencies of the Interprofessional Education Collaborative Expert Panel (2011), ie. Values/ethics for interprofessional practice and roles and responsibilities for the sake of comprehension. Round one required participants to list as many activities as possible to instil each of the eight core competencies into undergraduate students. While listing activities, they had to think of different assessments that could be used to evaluate the different competencies.

During round two, the researcher compiled a second questionnaire whereby participants had to rate the activities and assessment practices most favourable to instil IPE core competencies as presented in round one. The scale of reply extended from one to five, ranging from strongly agree to strongly disagree. The most common activity types and assessment methods were selected by the researcher from round one. Items were considered as 'common' where three or more participants made the same comment. The participants were given a space on the questionnaire to make any further comments should they feel that the items list was not appropriate or in alignment with comments they had made previously. Participants had to state whether they agreed with the listed assessments and activities by clearly stating "yes" or "no".

Since there were no objections and no comments made indicating inappropriateness of the listed items, the researcher concluded that consensus was reached at the completion of Round two. This decision was communicated to all participants, in addition to giving participants a final opportunity to dispute the decision, of which there were none.

5.3.4 Analysis

The questionnaires in the Delphi process included both qualitative and quantitative aspects. Hsu and Sandford (2007) emphasise that researchers need to find a suitable process to deal with the qualitative information collected. In this study the qualitative data in the form of comments was read together with suggested activities and assessment practices to further understand the reasons for listed items. Trustworthiness of the data was ensured by using Guba's (1981) four criteria of trustworthiness:

i) Credibility

The researcher adopted appropriate, well-recognised research methods, which were familiar to the culture of the participating institution and used random sampling of individuals serving as participants in the study; triangulation was done by the use of different methods, and different selected participants were used for different phases of the research study in varying contexts. Detailed descriptions were given of the background to the study and member-checks of data collected were done in the Delphi study by allocating numbers to participants and getting them to confirm data

ii) Transferability

The researcher provided background data in the study to establish the specific context and gave a detailed description of the phenomenon in question, to allow comparisons to be made with other/similar institutions.

iii) Dependability

Different methods used in this study allowed for overlap and integration in order for the development of an IPE model. In-depth methodological description was given in chapter two, which allows this study to be repeated.

iv) Confirmability

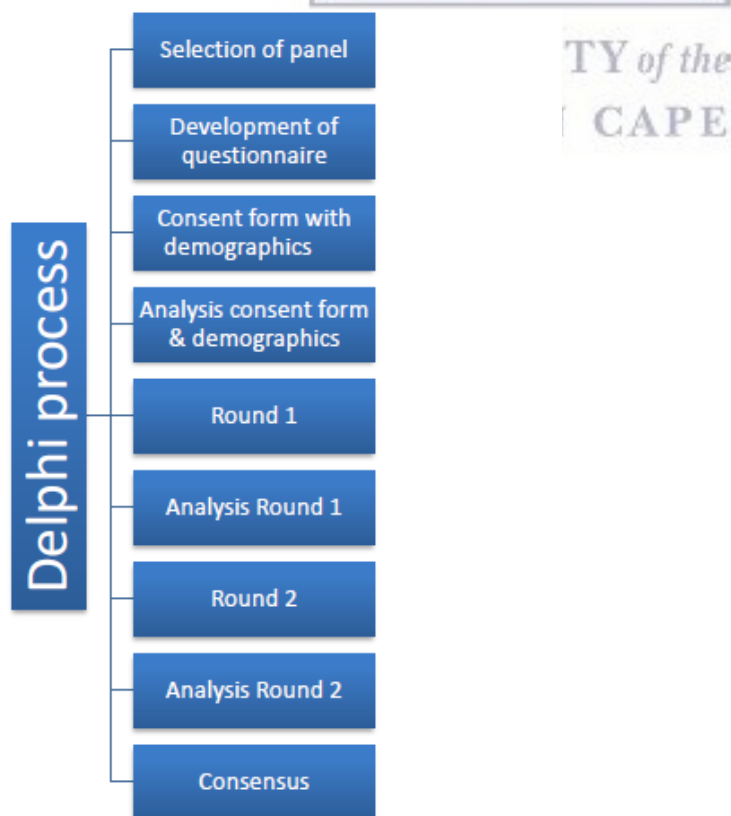
Researcher bias was reduced through triangulation of the data and all assumptions and beliefs of the researcher were outlined in each chapter; shortcomings in the methodology of the study and their likely effects are listed in the final chapter of the

study, as limitations and an in-depth methodological description is provided so as to allow integrity of research results which can be scrutinised by experts in the field.

Statistics used in Delphi studies can be interpreted by the use of a median score, which tends to be highly favoured when based on a Likert-type scale (Hill & Fowles, 1975; Eckman, 1983; Jacobs, 1996). Round two in this Delphi process incorporated a rating scale and the median scores for each core competency indicated consensus among the participants. Two nominal categories were formed to report the data from the Likert scale used by the researcher. Strongly Agreed and Agree were combined and Disagree and Strongly Disagree were combined for the purposes of reporting the findings. Green (1982) suggests that at least 70 percent of Delphi participants need to rate three points or higher on a four point Likert-type scale to reach consensus on subject matter.

Figure 5.1 provides an overview of the Delphi process in this study. This figure outlines the process from the recruitment of the participants (panel) up to the point where consensus was reached.

Figure 5.1: Process of the Delphi study



5.4 Results

During the first round of invitations, 29 participants were invited as experts in IPE to participate in the Delphi study and 11 consented to participate, yielding an initial response rate of 37.93%. As a result, the researcher had to expand the expert panel database and invite additional participants in order to have between 15 and 20 participants, as Ludwig (1997) indicates that “the majority of Delphi studies have used between 15 and 20 respondents”. The researcher was able to source the database of the newly formed African Interprofessional Network (AfrIPEN) and invited an additional forty potential participants. From the 40 potential participants, 20% agreed and gave consent to participate in the study (n=8).

From the two sets of invitations a total of 18 participants consented to engage in the Delphi study, thus yielding a response rate of 18/69 (26%). In round one, all 18 (100%) experts participated and in round two, 16 (88.88%) of the experts completed the questionnaires in the Delphi process. All 18 participants that had agreed to participate in the study, were invited to both rounds to provide feedback and comments. Participants were assured of anonymity and only by the use of a participant number could the researcher keep track of which participants completed their questionnaire. The participants who did not complete the process were encouraged to complete it by means of a courteous reminder through an email every second week.

5.4.1 Demographic details

The demographic profiles of the 17 participants are presented in Table 5.1. They comprise 47% females and 53% males and are from the following disciplines: nursing (n=4), physiotherapy (n=2), social work (n=1), medical doctors (n=5), occupational therapy (n=1), education (n=1), senior lecturers (n=2) and a Dean Emeritus (n=1). The minimum years of experience in IPE was three, and the maximum was 26 years. The year level of students participating in various IPE activities in which the participants were engaged included all year levels in both undergraduate and postgraduate programmes. The average number of students engaged in IPE activities by participants per annum ranged from 15 up to 2100. One of the participants with extensive experience, does not engage with students in his current role but has written extensively about IPE and is one of the pioneers in the field of IPE.

Table 5.1: Profile of participants

Gender	Profession	Years Of Experience	Year Level Of Student Involvement	Average Number Of Student Involvement Per Annum
Male	Social Work	26	n/a	n/a
Male	Dean Emeritus	20	Postgraduates	50
Female	Physiotherapy	20	3 rd and 4 th	25
Female	Occupational Therapy	5	1 st – 4 th	150
Female	Education	19	1 st and 4 th	>300 (1 st yr), 8 (4 th yr)
Male	Physiotherapy	5	1 st and 2 nd	100
Male	Medical doctor	23		2100
Female	General practitioner	20	n/a	n/a
Female	Medical practitioner	15	2 nd – 6 th	250
Female	Senior lecturer	20	1 st – final semester	300
Female	Nursing	8	Under and postgraduate	150 (u/g), 15-20 (p/g)
Female	Nursing	7	Under and postgraduate	25
Female	Nursing	3	4 th	300
Male	Medical practitioner	13	4 th – 6 th	23
Male	Surgeon	12	Under and postgraduate	400
Female	Senior lecturer	7	1 st – 3 rd	20
Female	Nursing	10	Postgraduate	90

5.4.2 Results of Delphi round 1

In the first round, 17 participants responded by giving input on the questionnaire circulated by the researcher. The respondents gave an extensive list of activities to instil interprofessional core competencies into students. The six core competencies identified by the Canadian Interprofessional Health Collaborative (CIHC, 2010) and an additional competency, Values/ethics for interprofessional practice (Interprofessional Education Collaborative Expert Panel, 2011) were used as the IPE core competency set for this study. These seven competencies were used as the framework in the Delphi study whereby participants could give input on each domain. For each competency, the participants had to give ideas of how to assess whether these competencies were attained by students and, lastly, input was given on additional competencies that could be added to the list for consideration by the researcher when designing the IPE model.

A summary of the IPE core competencies, with matching activities and the most appropriate assessment ideas presented by the participants, are listed below in Table 5.2.

Table 5.2: Activities and assessments to instil interprofessional core competencies

Ipe Core Competencies	Activities	Assessments
Interprofessional communication	Joint assignments, team building exercises, interprofessional team-based placements, interprofessional case presentations, shared theory classes, discussion groups on an e-learning system (blended learning), joint tutorials, developing a common language between professionals (e.g. ICF), workshops, various activities (games/role-plays/case studies) with a reflective component	Observations, group/team assignments, focus groups, interviews, peer assessments, questionnaires, portfolios, self-assessment (reflection)
Patient/client/family/community-centred care	Live/real case studies, interprofessional ward rounds,	Observation, feedback from patients/clients/family/communi

	involvement of actual clients/patients and family in discussions and planning, demonstrations by team to advocate for client/patient/family/community	ty, development of a rubric, portfolios, student teams working on real cases/scenarios
Role clarification	Case studies, joint projects, workshops/discussions, role plays, reflective journaling, simulations, observing other professionals	Use of rubric, reflection (case studies/reports/journals), portfolios, OSCE/OSPE, formative feedback, Self-evaluation (videos/questionnaires/feedback from clients, family & community), group assignments
Team functioning	Teambuilding exercises, workshops, group projects, formal team meetings, simulations, interprofessional mentoring, icebreakers	Assignments, interviews and focus groups, observe and document team behaviour, reflection, portfolios, simulated activities, use of rubrics
Collaborative leadership	Student-led teams/groups on campus and during placement, case discussions, problem-based assignments, role plays, videos and collaborative exercises, use of ICF as a framework, games and debriefing, service-learning or community projects, Development of a rotational schedule of leadership within team	Observation, peer review, reflections, portfolios, simulated activities, formative feedback, rubrics, collaborative assessment tool
Interprofessional conflict resolution	Case studies, role plays, YouTube clips for discussion, workshops, simulated environments, debriefing, team discussions	Observations and feedback, rubrics, questionnaires, written exam questions around scenarios, simulated role-plays, reflective journals, portfolios, collaborative assessment tool
Values/ethics for interprofessional practice	Simulation activities, role plays, case study discussions, games/exercises, small group discussions with reflection, collaborative assessments using the ICF framework,	Observations, facilitating discussions with students, essay questions, case study rubrics, simulated role plays, formative feedback/ debriefing of situations experienced,

	longitudinal portfolios, networking with other professionals, role-modelling within the IP lecture team, value clarification exercises among professionals	longitudinal portfolios, participation in scientific conferences, collaborative assessment tool, pre- and post-questionnaires, e-learning discussions
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Participants were asked two additional questions to assist the researcher further in designing an interprofessional programme for the faculty. The questions were:

- 1) What would some of the guiding principles be for integrating IPE and Interprofessional Practice (IPP) into a faculty curriculum from 1st to 4th year?
- 2) Are there any other interprofessional competencies that could be added to this list?

Guiding principles for implementation of an IPE programme and additional core competencies are listed in Table 5.3 and Table 5.4 below.

Table 5.3: Guiding principles for implementation of an IPE programme

Guiding Principles
<ul style="list-style-type: none"> • Parity as learners • Mutual respect • Valuing differences • Working towards common goals • Teamwork • Leadership • Shared decision-making • Timetable alignment • Shared assessment practices • Commitment from faculty • Change management and communication plan to promote IPECP • Support from an accredited professional body • Interprofessional supervision • IPE modules and integration into curriculum

- Training the teachers to use participatory learning methods
- Improve collaboration with training facilities
- Simulation activities to practice and develop IP skills
- Health promotion projects
- Collaborative practice outcomes to be integrated into curriculum
- Joint lectures

Table 5.4: Additional IP core competencies

Additional Ip Core Competencies
<ul style="list-style-type: none"> • Academic literacy • Life-long learning • Health advocacy • Constructively engage as change agents • Research • Graduate attributes • Understanding health systems, policy and determinants of health

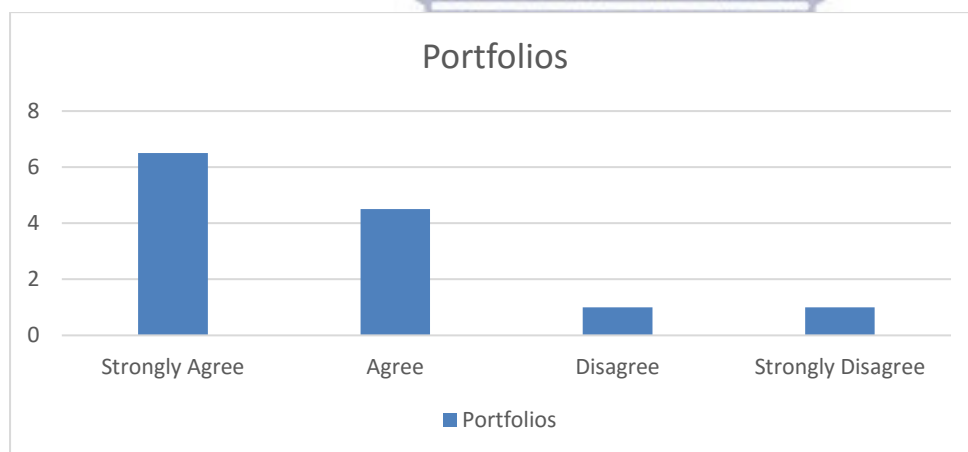
At the end of round one, participants had the opportunity to make overall comments for the researcher to consider about the process being undertaken. Out of the 17 participants, there were only a few comments to consider, while the other participants had no further comments and wished the researcher well with the rest of the process. The participant with the most experience and a pioneer in the field of IPE, felt that it was a “neat exercise”. The notion of role-modelling and mentorship emerged as a comment, in that the staff from every discipline participating should be included in all IPE activities in which their students are engaged. Two of the participants indicated that the term ‘Allied health professions’ does not include medical, nursing, social work, psychology, pharmacy and community health workers and that the researcher should consider using another term to include all disciplines. Another comment for the implementation process was to include clinical educator and other stakeholders in the planning process, so that the IPE programme would not only be accepted in the academic

environment but in clinical practice as well. A 360⁰ evaluation of students by other professions, Non-Profit Organisations (NPOs) and Community Health Workers, was another form of assessment suggested. The last comment was that the researcher needed to consider underlying educational principles and methodologies for transformative learning. The advice given in the last comment was adhered to by the researcher when developing the IPE model in Chapter seven.

5.4.3 Results of Delphi Round Two

The suggestions given for activities and assessment strategies that were common to the majority of participants were summarised and sent back to the participants for confirmation in the form of round two. Participants were requested to rate each suggestion given on a scale (Table 5.5) and make necessary comments should there be any discrepancies.

Figure 5.2: An example of a rating scale for activities and assessment strategies



In round two participants were requested to confirm the suggestions given in Round one as activities and assessment strategies to instil interprofessional core competencies into undergraduate student training. Not all suggestions were listed but rather those that were found to be common to all participants, for further confirmation. Participants had to rate each suggestion by indicating on a scale whether they ‘Strongly agree’, ‘Agree’, ‘Disagree’ or ‘Strongly disagree’. These suggestions were ranked according to the highest rating indicating the most favourable activities and assessment strategies by the expert panel. From the 17

participants from round one, 14 responded to Round two, indicating an 82% participation rate. Table 5.6 indicates the rating under each core competency.

Table 5.5: Response from experts round two on activities

Ipe Core Competency	Activities	RATING SCALE			
		Strongly Agree	Agree	Disagree	Strongly Disagree
Interprofessional communication	Joint assignments	43.8%	37.5%	6.3%	6.3%
	Team building exercises	56.3%	31.3%	6.3%	0%
	Interprofessional team-based placements	81.3%	12.5%	0%	0%
	Interprofessional case presentations	56.3%	31.3%	6.3%	0%
	Shared theory classes	0%	37.5%	43.8%	12.5%
	Discussion groups on an e-learning system (blended learning)	18.8%	37.5%	31.3%	6.3%
	Joint tutorials	25%	37.5%	18.8%	12.5%
	Developing a common language between professionals (e.g. ICF)	25%	56.3%	6.3%	6.3%
	Workshops	25%	50%	18.8%	0%
	Various activities (games/role-plays/case studies) with a reflective component	56.3%	31.3%	6.3%	0%
Patient/client/family/ community-centred care	Live/real case studies	68.8%	25%	0%	0%
	Interprofessional ward rounds	43.8%	37.5%	12.5%	0%
	Involvement of actual clients/patients and family in discussions and planning	75%	6.3%	12.5%	0%
	Demonstrations by team to advocate for client/patient/family/community	37.5%	50%	6.3%	0%
Role clarification	Case studies	66.7%	33.3%	0%	0%

	Joint projects	46.7%	46.7%	6.7%	0%
	Workshops/discussions	40%	53.3%	6.7%	0%
	Role plays	53.3%	40%	6.7%	0%
	Reflective journaling	26.7%	46.7%	26.7%	0%
	Simulations	53.3%	40%	6.7%	0%
	Observing other professionals	13.3%	60%	20%	6.7%
Team functioning	Teambuilding exercises	40%	46.7%	13.3%	0%
	Workshops	13.3%	66.7%	20%	0%
	Group projects	46.7%	40%	13.3%	0%
	Formal team meetings	40%	40%	20%	0%
	Simulations	46.7%	33.3%	20%	0%
	Interprofessional mentoring	46.7%	40%	13.3%	0%
	Icebreakers	6.7%	53.3%	26.7%	13.3%
Collaborative leadership	Student-led teams/groups on campus and during placement	60%	33.3%	6.7%	0%
	Case discussions	20%	73.3%	6.7%	0%
	Problem-based assignments	40%	53.3%	6.7%	0%
	Role plays videos and collaborative exercises	60%	33.3%	6.7%	0%
	Use of ICF as a framework				
	Games and debriefing	40%	33.3%	26.7%	0%
	Service-learning or community projects	13.3%	53.3%	20%	13.3%
	Development of a rotational schedule of leadership within team	73.3%	26.7%	0%	0%
		33.3%	53.3%	6.7%	6.7%
Interprofessional conflict resolution	Case studies	26.7%	60%	6.7%	6.7%
	Role plays	53.3%	46.7%	0%	0%
	YouTube clips for discussion	26.7%	46.7%	26.7%	0%
	Workshops	26.7%	66.7%	6.7%	0%
	Simulated environments	60%	33.3%	6.7%	0%
	Debriefing	53.3%	46.7%	0%	0%
	Team discussions	73.3%	26.7%	0%	0%
Values/ethics for interprofessional practice	Simulation activities	46.7%	26.7%	20%	6.7%
	Role plays	53.3%	40%	6.7%	0%
	Case study discussions	60%	33.3%	6.7%	0%
	Games/exercises	20%	53.3%	26.7%	0%
	Small group discussions with reflection	60%	40%	0%	0%

	Collaborative assessments using the ICF framework	26.7%	33.3%	40%	0%
	Longitudinal portfolios	33.3%	33.3%	33.3%	0%
	Networking with other professionals	26.7%	60%	13.3%	0%
	Role-modelling within the IP lecture team	33.3%	46.7%	20%	0%
	Value clarification exercises among professionals	40%	46.7%	13.3%	0%

Table 5.6: Response from experts on round two assessment strategies

IPE CORE COMPETENCY	ASSESSMENTS	RATING SCALE			
		STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
Interprofessional communication	Observations	25%	56.3%	6.3%	6.3%
	Group/team assignments	50%	37.5%	6.3%	0%
	Focus groups	18%	68.8%	6.3%	0%
	Interviews	18.8%	56.3%	18.8%	0%
	Peer assessments	37.5%	43.8%	6.3%	6.3%
	Questionnaires	18.8%	31.3%	31.3%	12.5%
	Portfolios	37.5%	43.8%	6.3%	6.3%
Patient/client/family/ community-centred care	Self-assessment (reflection)	43.8%	31.3%	18.8%	0%
	Observation	25%	50%	18.8%	0%
	Feedback from patients/clients/family/community	68.8%	12.5%	12.5%	0%
	Development of a rubric	6.3%	68.8%	12.5%	6.3%
	Portfolios	43.8%	37.5%	12.5%	0%
Role clarification	Student teams working on real cases/scenarios	62.5%	25%	6.3%	0%
	Use of rubric	6.7%	53.3%	33.3%	6.7%
	Reflection (case studies/reports/journals)	46.7%	40%	13.3%	0%
	Portfolios	20%	66.7%	13.3%	0%

	OSCE/OSPE	20%	33.3%	46.7%	0%
	Formative feedback,	60%	33.3%	6.7%	0%
	Self-evaluation (videos/questionnaires/feedback from clients Family & community)	53.3%	26.7%	20%	0%
	Group assignments	46.7%	33.3%	20%	0%
Team functioning	Assignments	13.3%	46.7%	33.3%	6.7%
	Interviews and focus groups	13.3%	53.3%	33.3%	0%
	Observe and document team behaviour	46.7%	53.3%	0%	0%
	Reflection	33.3%	60%	6.7%	0%
	Portfolios	26.7%	53.3%	20%	0%
	Simulated activities	66.7%	20%	6.7%	6.7%
	Use of rubrics	6.7%	60%	33.3%	0%
Collaborative leadership	Observation	13.3%	66.7%	20%	0%
	Peer review	40%	53.3%	6.7%	0%
	Reflections	26.7%	53.3%	20%	0%
	Portfolios	33.3%	53.3%	13.3%	0%
	Simulated activities	46.7%	33.3%	20%	0%
	Formative feedback	53.3%	40%	6.7%	0%
	Rubrics	6.7%	66.7%	26.7%	0%
	Collaborative assessment tool	46.7%	33.3%	13.3%	6.7%
Interprofessional conflict resolution	Observations and feedback Rubrics	40%	40%	20%	0%
	Questionnaires	6.7%	33.3%	60%	0%
	Written exam questions around scenarios	0%	26.7%	53.3%	20%
	Simulated role-plays	0%	33.3%	46.7%	20%
	Reflective journals	53.3%	26.7%	20%	0%
	Portfolios	26.7%	60%	13.3%	0%
	Collaborative assessment tool	40%	33.3%	26.7%	0%
		33.3%	53.3%	13.3%	0%

Values/ethics for interprofessional practice	Observations	26.7%	60%	13.3%	0%
	Facilitating discussions with students	46.7%	46.7%	0%	6.7%
	Essay questions	6.7%	13.3%	66.7%	13.3%
	Case study rubrics	20%	40%	33.3%	6.7%
	Simulated role plays	46.7%	40%	6.7%	6.7%
	Formative feedback/debriefing of situations experienced	73.3%	20%	6.7%	0%
	Longitudinal portfolios	33.3%	33.3%	26.7%	6.7%
	Participation in scientific conferences	0%	46.7%	40%	13.3%
	Collaborative assessment tool	20%	53.3%	13.3%	13.3%
	Pre- and post-questionnaires	6.7%	53.3%	26.7%	13.3%
	E-learning discussions	33.3%	40%	13.3%	13.3%

5.5 Consensus on Interprofessional Core Competency Activities

Through the successful implementation of the Delphi study the following activities and assessment strategies were confirmed as the most effective in instilling interprofessional core competencies in undergraduate students across all disciplines. The most preferred activities (with a score above 80%) for Interprofessional Communication (Figure 5.4.1) according to the scores from the expert panel from highest to lowest are: interprofessional team-based placements, team building exercises, using various activities (like games/role plays/case studies) with a reflective component, joint assignments, interprofessional case presentations and developing a common language between professionals (e.g. ICF). Activities with lower scores, but still rated as favourable by the expert panel, were joint tutorials (62.5%) and discussion groups on an e-learning system (56.3%). The only activity that the experts disagreed on was shared theory classes (56.3%) as an activity to instil Interprofessional Communication. Comments by the expert panel for this competency further supported the selected activities by stating the following:

“Activities should be credit bearing”.

“Students must be assessed together as a team”.

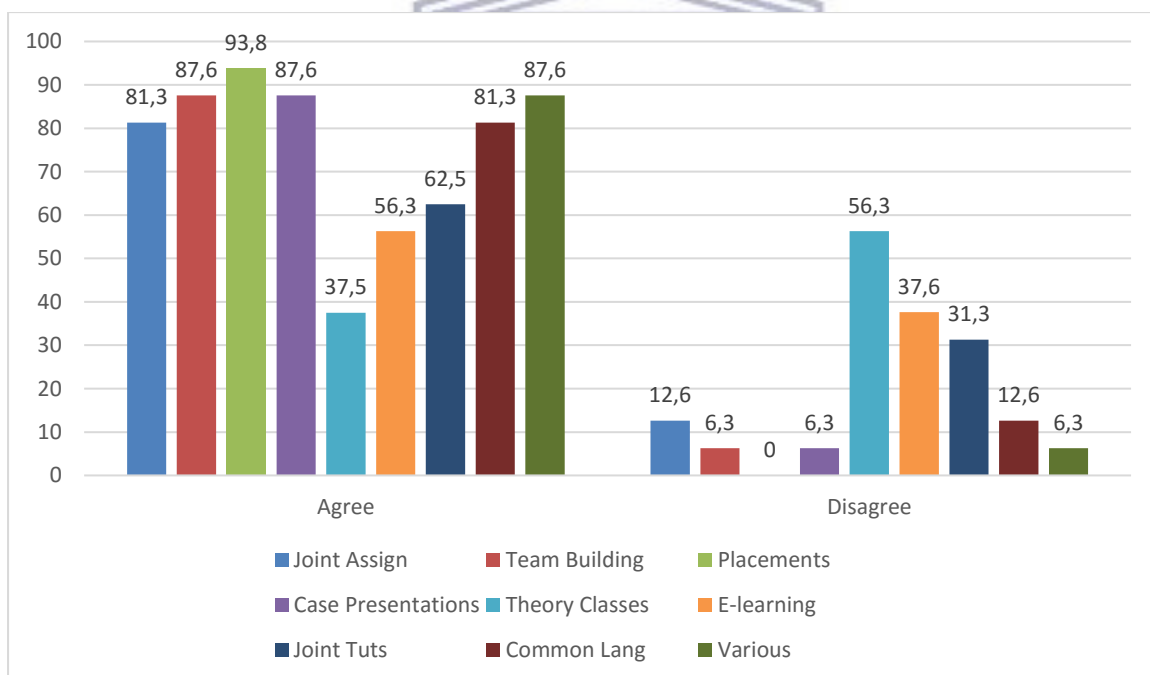
“Joint assignments would only work if they were structured in a manner that facilitates communication within the team”.

“Teambuilding exercises will improve teamwork, team roles and communication... but not necessarily interprofessional communication. It is of huge value in general”.

“Being reported strongly in the literature, notably from Australia and Denmark, with many promising models” (participant referring to interprofessional team-based placements).

“Placement is the better place for students to learn to communicate collaboratively”.

Figure 5.3: Interprofessional Communication



The most preferred activities for Patient/Client/Family/Community-Centred Care with scores above 80%, are indicated in Figure 5.4.2 below. Comments from participants supporting this

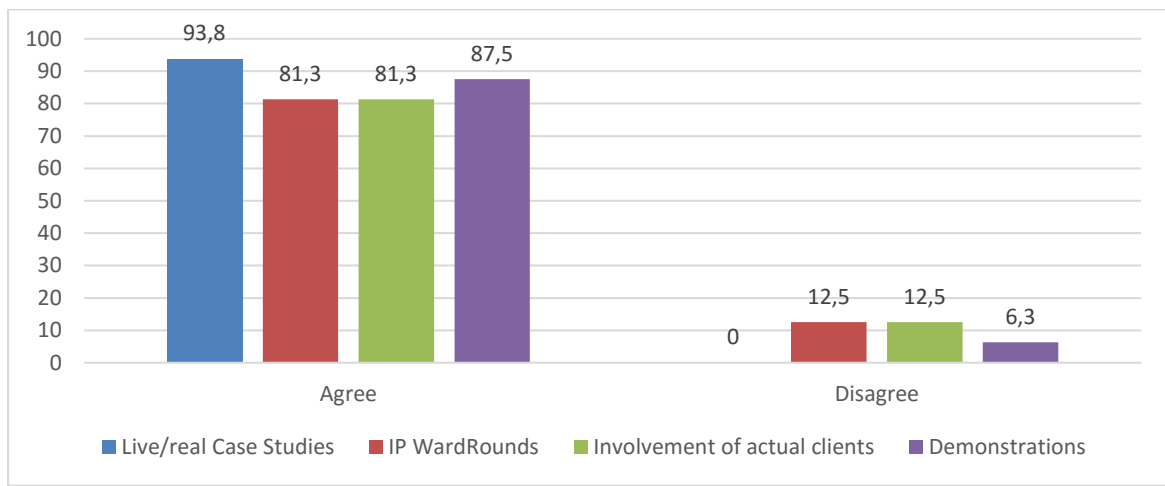
competency were especially geared towards interprofessional ward rounds and stated as follows:

“Yes, with small manageable groups”.

“With appropriate rotating leadership, not only the doctors leading”.

“Then it must be really IP, so the professionals must explicitly model IPCP - not just standing around the bed with the Dr talking”.

Figure 5.4: Patient/client/family/community-centred care



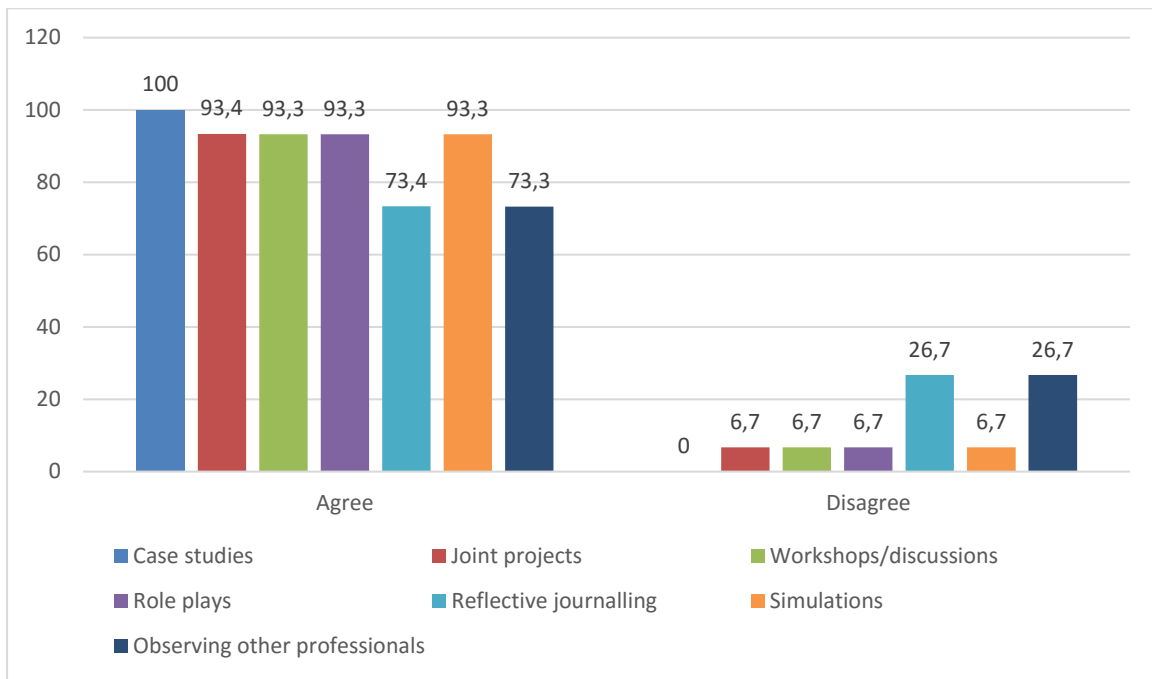
WESTERN CAPE

The most preferred activities for Role Clarification, according to the expert panel, are: case studies, joint projects, workshops/discussions, role plays, reflective journaling, simulations and observing other professionals (Figure 5.4.3). Comments from experts for this competency are captured below:

“They must be guided explicitly by facilitators otherwise they may miss half the stuff”.

“With post-observation reflection and discussion” (with regards to observing other professionals).

Figure 5.5: Role Clarification



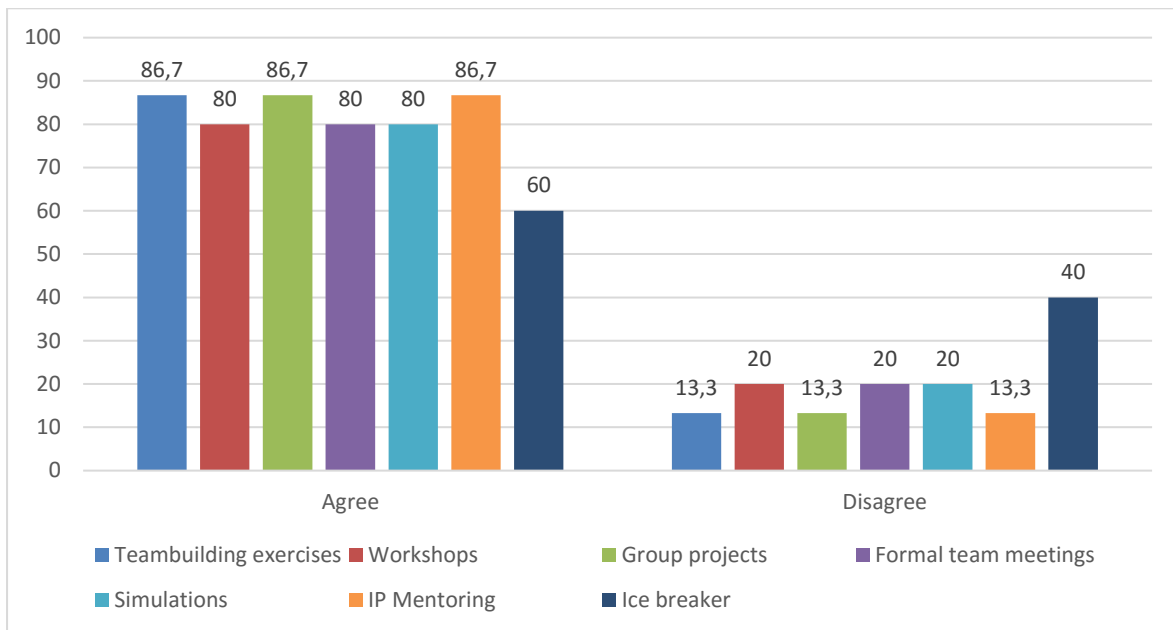
The most preferred activities for Team Functioning according to the expert panel, are listed in Figure 5.4.4 below. All activities are scored 80% and higher, apart from Ice Breakers, of which 60% of the participants agreeing that it was a suitable activity for this competency. Supporting comments for this competency are listed as:

“It is very useful if the team are actually working together. Not so much if there an exercise and then the students disappear again”.

“But then preparation, explicit guidelines re TF, and debriefing is NB”.

“Then there should be good observation, debriefing and feedback” (with regards to simulations).

Figure 5.6: Team Functioning



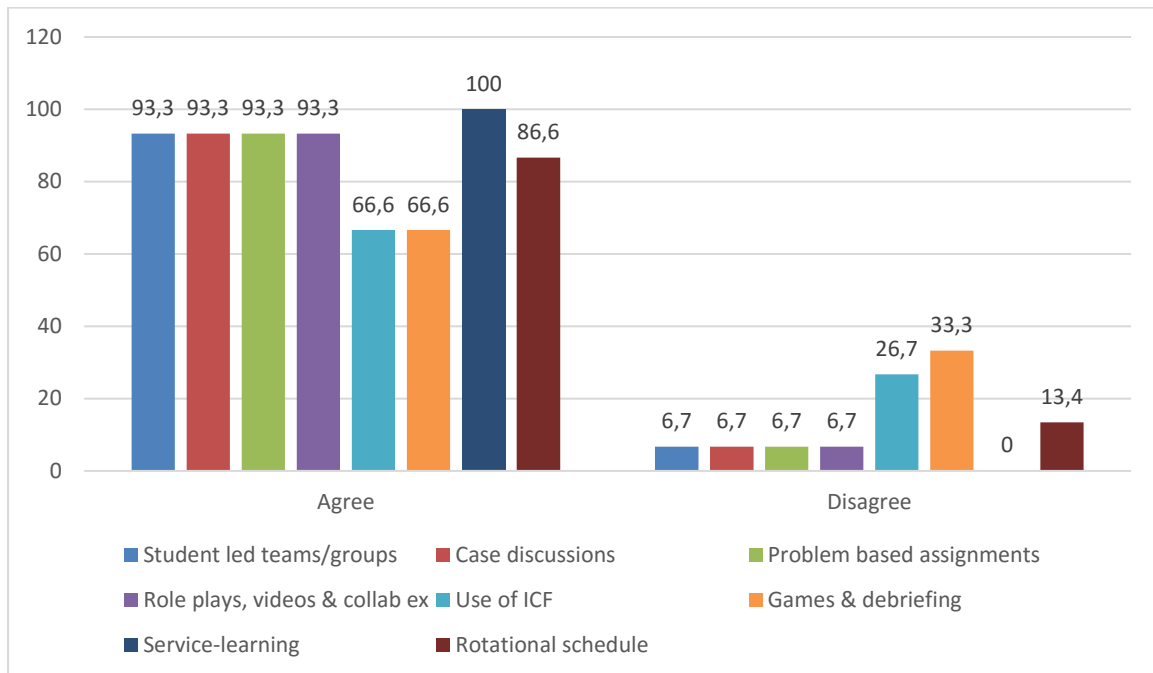
Participants agreed on the following activities as the preferred activities for Collaborative Leadership: Student-led teams/groups on campus and during placement, case discussions, problem-based assignments, role plays, videos and collaborative exercises, use of ICF as a framework, games and debriefing, service-learning or community projects and development of a rotational schedule of leadership within a team (Figure 5.4.5). The only two activities that scored lower than the others were use of ICF as a framework, and games and debriefing, of which 66.6% of the respondents agreed were suitable activities. Comments supporting these activities are listed below:

“This may be about LS (leadership), but not necessarily CLS (collaborative leadership). It can work if the team is more mature” (regarding student-led teams/groups on campus and during placements).

“Yes it works, but is more effective if the team is together for a while and not just a once off” (regarding role plays, videos and collaborative exercises).

“The ICF, if used as a non-linear tool embodying complexity, forces one to work collaboratively and allow for different case managers (leaders) at the appropriate time. It helps to break down silos. It is more effective in real cases. On paper cases it can be a good tool. It helps students to see the whole picture and that different types of leaders are needed at different stages” (regarding the use of the ICF as a framework).

Figure 5.7: Collaborative Leadership

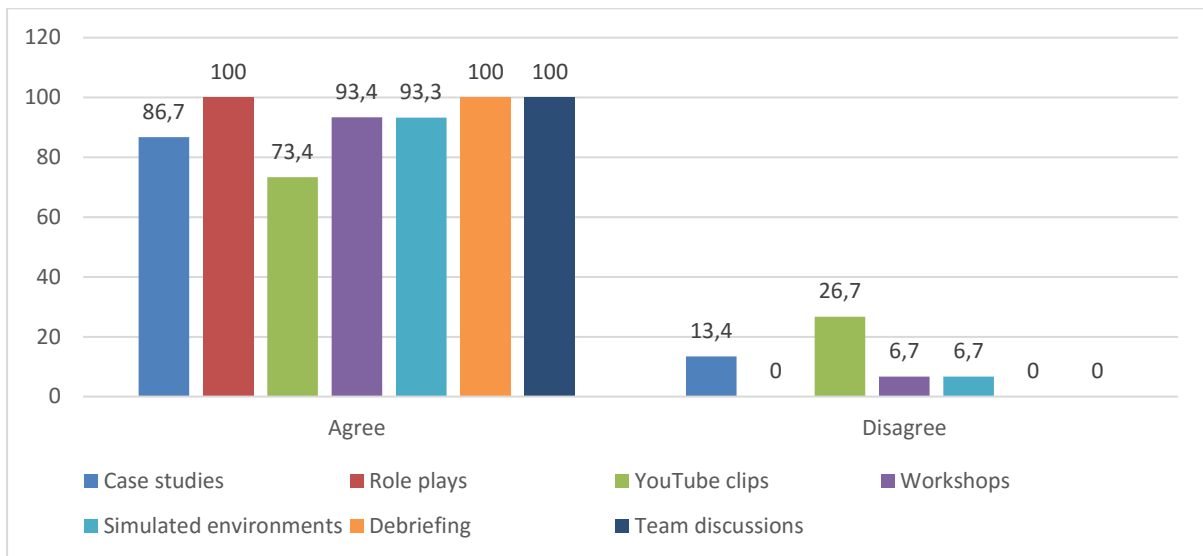


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The most preferred activities for Interprofessional Conflict Resolution according to the expert panel, are listed in Figure 5.4.6 below. All activities scored 86% and above, apart from YouTube clips for discussion, in which 73.4% of the participants agreed was a suitable activity for this competency. Supporting comments for this competency are listed:

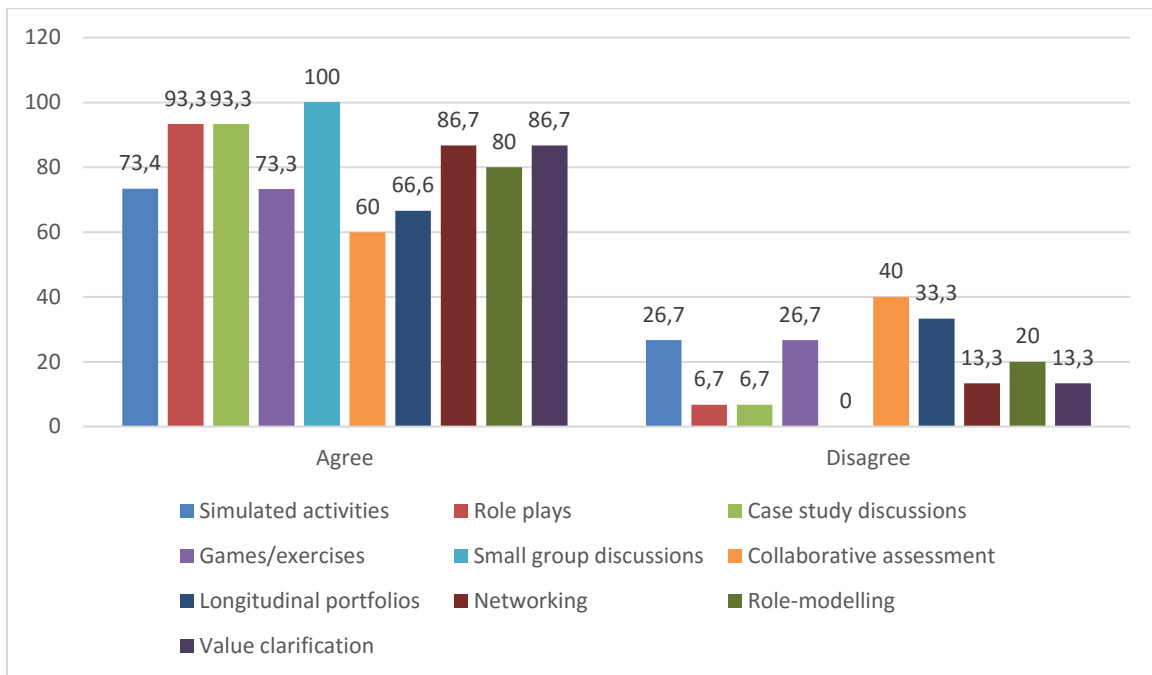
“Students must have a model how to handle conflict. Not only in behaviour but also in mature inner functioning (identity). All these tools listed can work, but then you must have a framework to evaluate your own inner world and how to present yourself in a mature way”.

Figure 5.8: Interprofessional Conflict Resolution



Participants agreed on the following activities as the preferred activities for Values/Ethics for Interprofessional Practice: simulation activities, role plays, case study discussions, games/exercises, small group discussions with reflection, collaborative assessments using the ICF framework, longitudinal portfolios, networking with other professionals, role-modelling within the IP lecture team and value clarification exercises among professionals (Figure 5.4.7). The only two activities that scored lower were collaborative assessment using the ICF framework and longitudinal portfolios, of which 60% and 66.6% of the respondents agreed to as suitable activities.

Figure 5.9: Values/Ethics for Interprofessional Practice



The following assessment strategies were indicated by the expert panel as the most appropriate to use when evaluating interprofessional core competencies. The favoured strategies for Interprofessional Communication were: observations, group/team assignments, focus groups, interviews, peer assessments, questionnaires, portfolios and self-assessment (reflection) (Figure 5.4.8). All items under this competency were rated favourably by 75% of the experts and above. The lowest-rated item was questionnaires as an assessment for Interprofessional Communication, to which 50.1% of participants agreed. Relevant comments under this competency include:

“A competency must be observed...” (regarding observations).

“Only with reflection afterwards” (regarding observations).

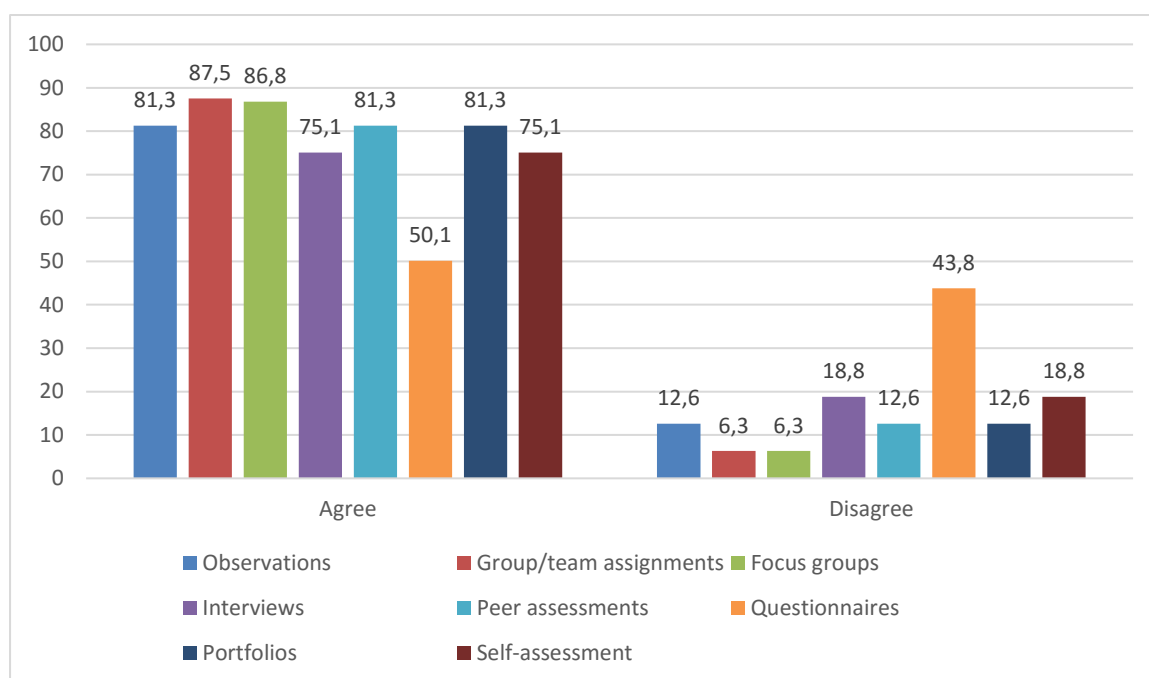
“The interview must be designed by experts. In our case it was done by Industrial Psychologists. The interview must be >1 profession (regarding the use of interviews).

“Once again students need training how to give formative feedback” (regarding the use of peer assessments).

“It provides the measurement of a milestone, but doesn't develop competency” (regarding the use of questionnaires).

“It must be a longitudinal portfolio” (regarding the use of portfolios).

Figure 5.10: Interprofessional Communication

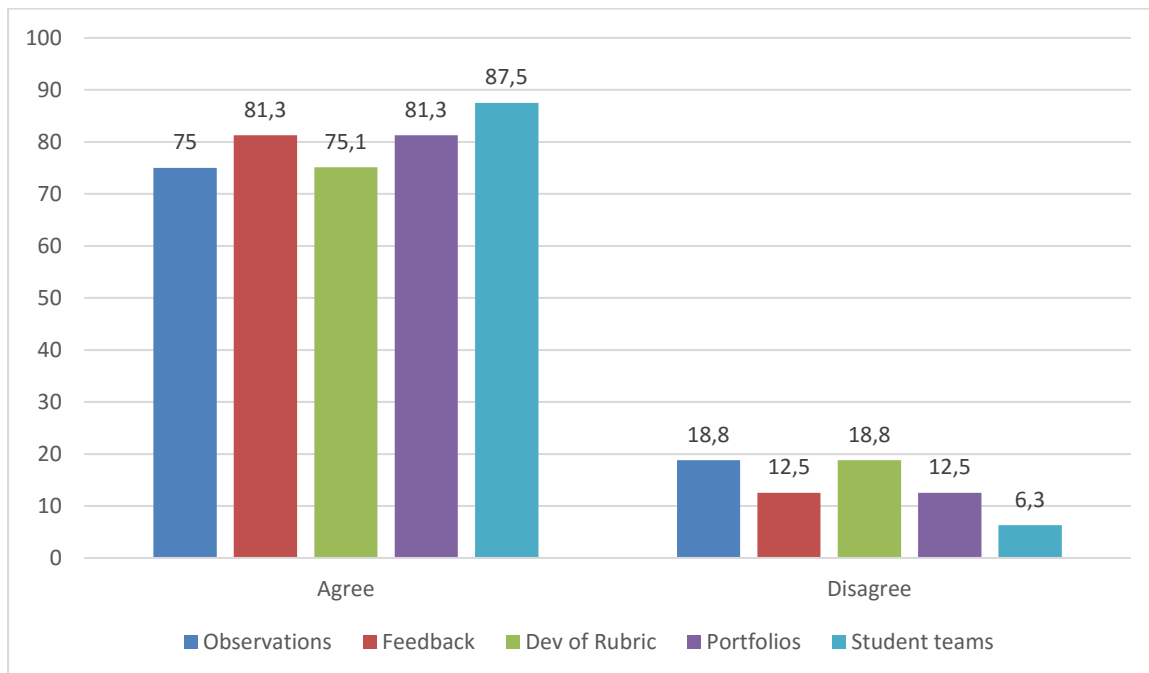


The most preferred assessments for patient/client/family/community-centred care, according to the expert panel, are listed in Figure 5.4.9 below. All assessment strategies are in agreement with at least 75% and more of the experts’ opinions. Supporting comments for this competency are listed as:

“The rubric will assist” (with regards to developing a rubric)

“With feedback” (with regards to using observations)

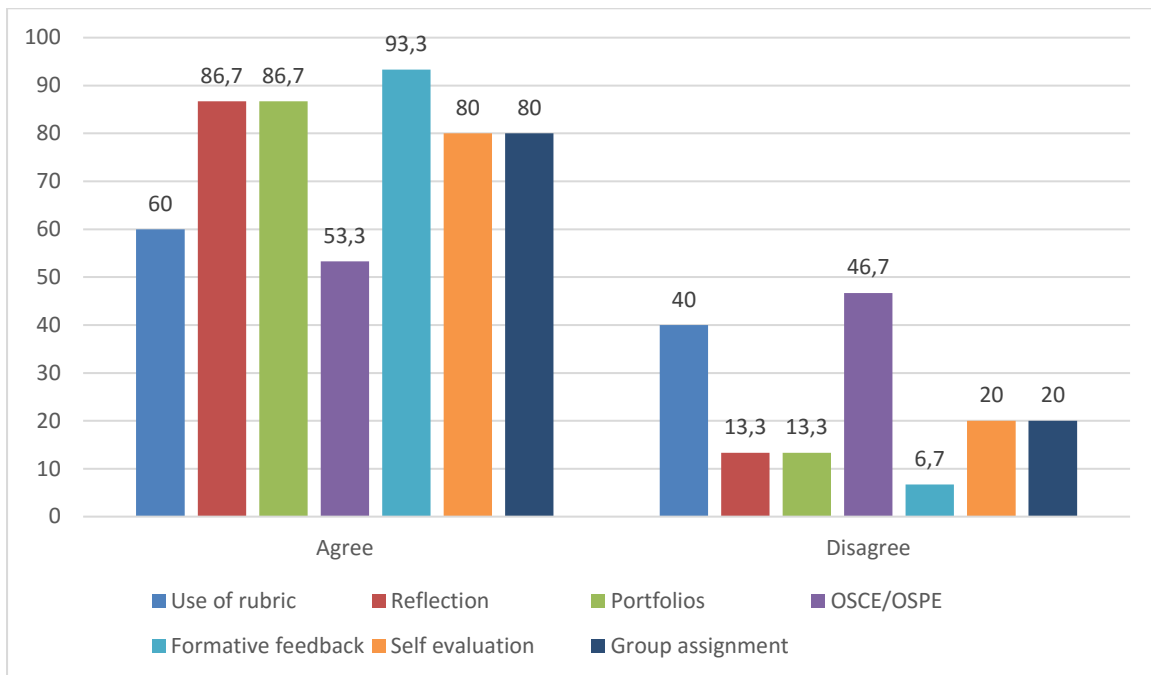
Figure 5.11: Patient/client/family/ community-centred care



The most preferred assessments for Role Clarification, according to the expert panel, are listed in Figure 5.4.10 below. All assessment strategies are in agreement with at least 80% and more of the experts. Two of the assessment strategies are in agreement with fewer of the participants, namely, the use of rubric (60%) and OSCE/OSPES (53.3%).



Figure 5.12:



The most favoured assessment strategies for Team Functioning by the expert panel were: observe and document team behaviour, reflection, portfolios and simulated activities (Figure 5.4.11). The assessment strategies rated by fewer participants were: assignments (60%), interviews and focus groups (66.6%) and the use of rubrics (66.7%). Supporting comments by experts listed below:

“If it is an assignment, students should have worked on something for a while. You cannot measure a team if they've been together for a day or two. Team dynamics take weeks to develop”.

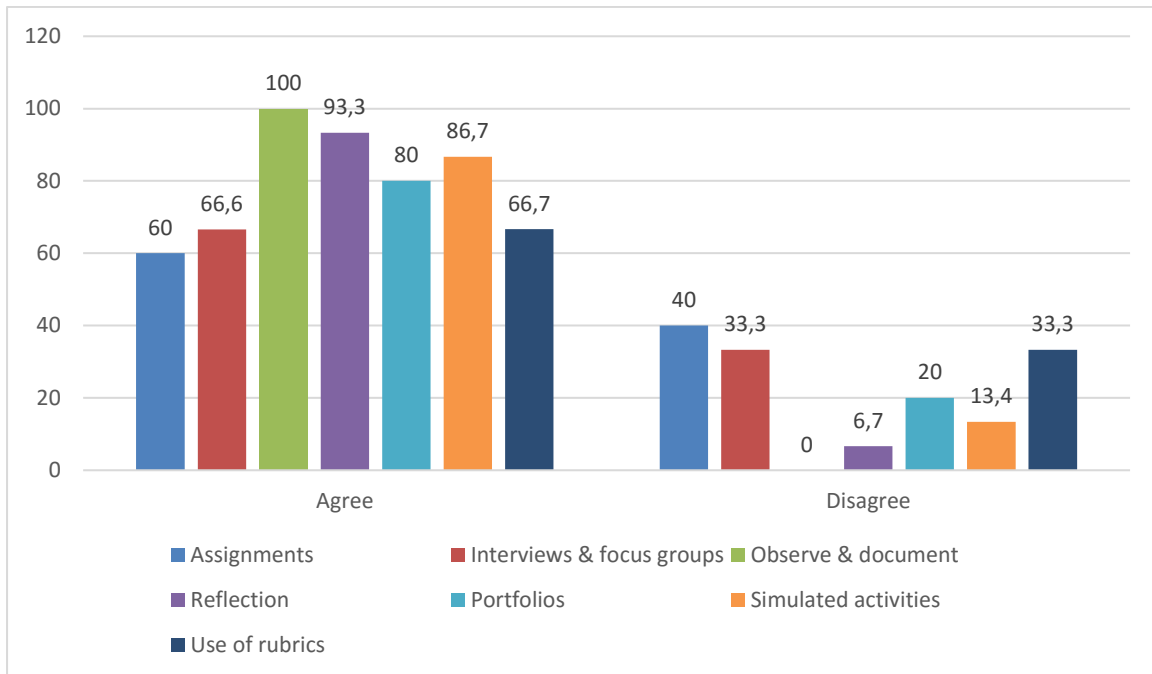
“Direct observation over a period of time (not a single event) - otherwise it is team BS and not TF”.

“If it is confidential and the rubric and guidance give clear guidance, Introspection and honesty NB”.

“A once off event cannot measure TF” (with regards to the use of simulation activities).

“If it is used to assess behaviour over time and not once off mechanistically” (with regards to the use of rubrics).

Figure 5.13: Team Functioning

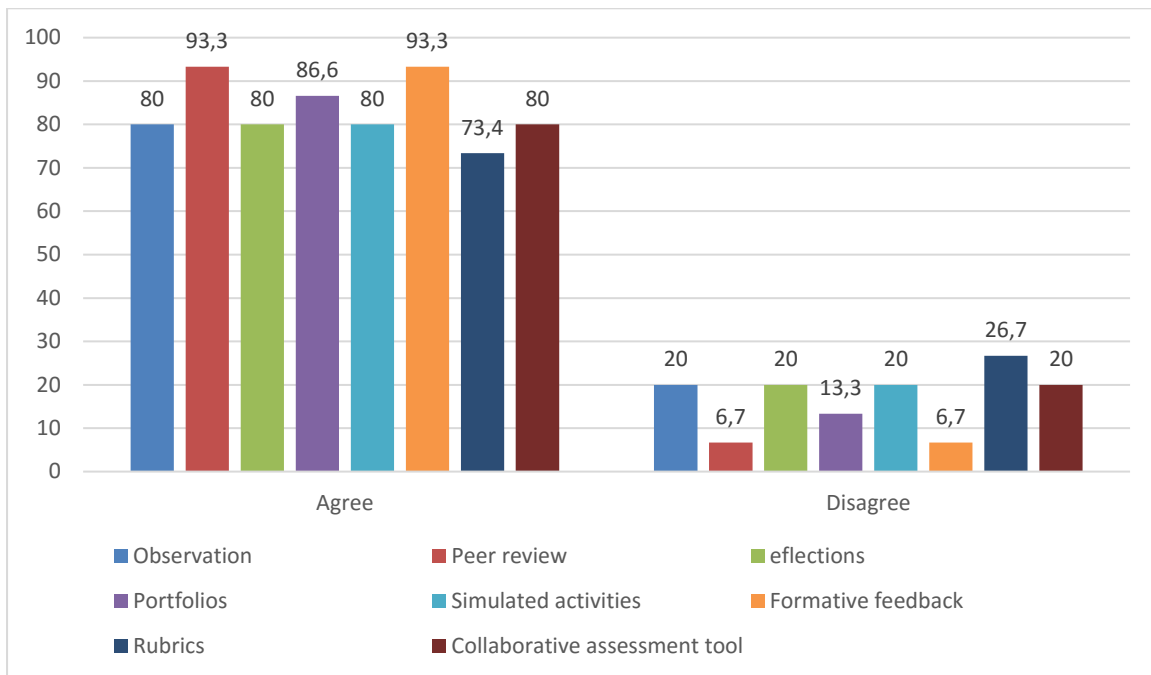


All assessment strategies selected by the expert panel were highly favoured by all for Collaborative Leadership (Figure 5.4.12). Supporting comments were:

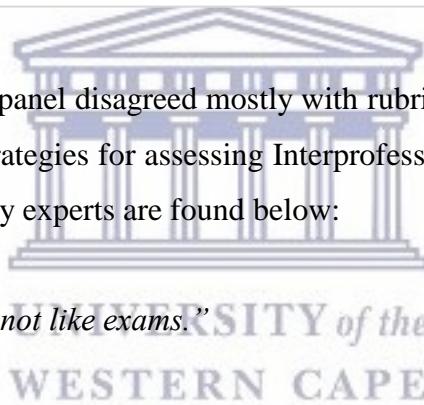
“A validated rubric can help to give better feedback”.

“With reflection” (regarding the use of portfolios).

Figure 5.14: Collaborative Leadership



In this competency the expert panel disagreed mostly with rubrics, questionnaires and written exams as being appropriate strategies for assessing Interprofessional Conflict Resolution (see Figure 5.4.13). Justifications by experts are found below:



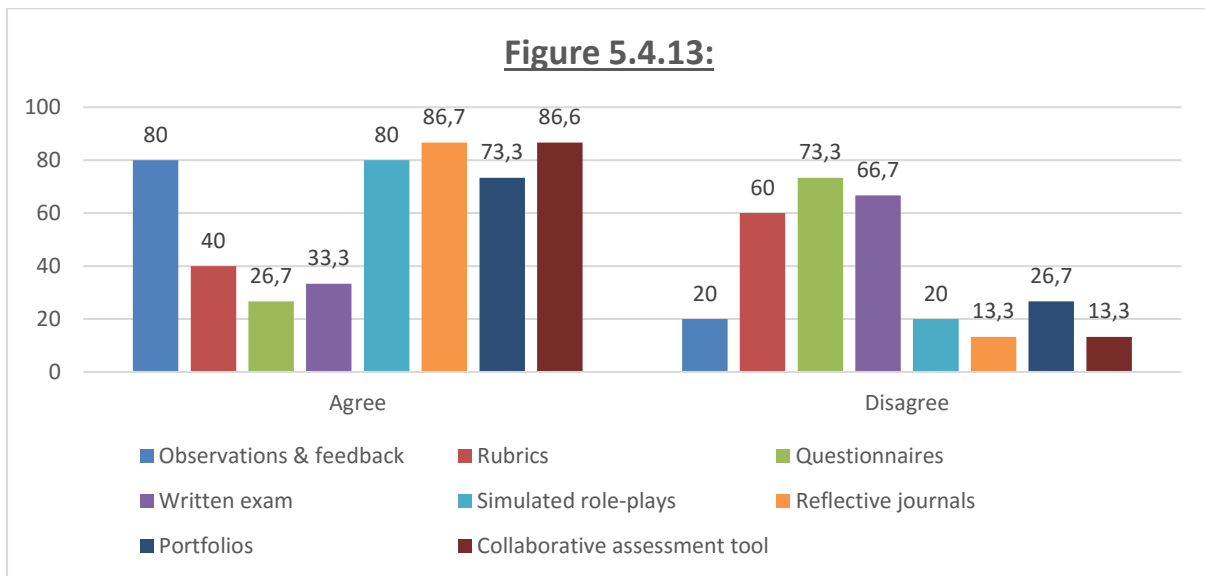
“Ordinarily people do not like exams.”

“Allowing a student to analyse his/her conflict situations and demonstrate how conflict management is practiced using the tools”. (with regards to the use of reflective journals).

“Critical affective-cognitive critical analysis is needed” (with regards to the use of reflective journals).

“Demonstrating process of learning and improving” (with regards to the use of portfolios).

Figure 5.15: Interprofessional Conflict Resolution



The assessment strategies most favoured by the expert panel were: Observations, facilitating discussions with students, simulated role plays, formative feedback/debriefing of situations experienced and the collaborative assessment tool (see Figure 5.4.12). The explanations least favoured by the experts were: essay questions, case study rubrics, longitudinal portfolios, participation in scientific conferences and pre-/post-questionnaires.

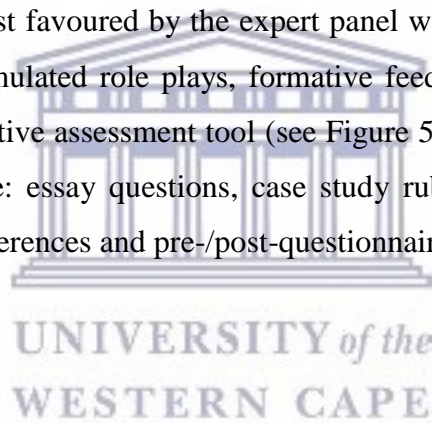
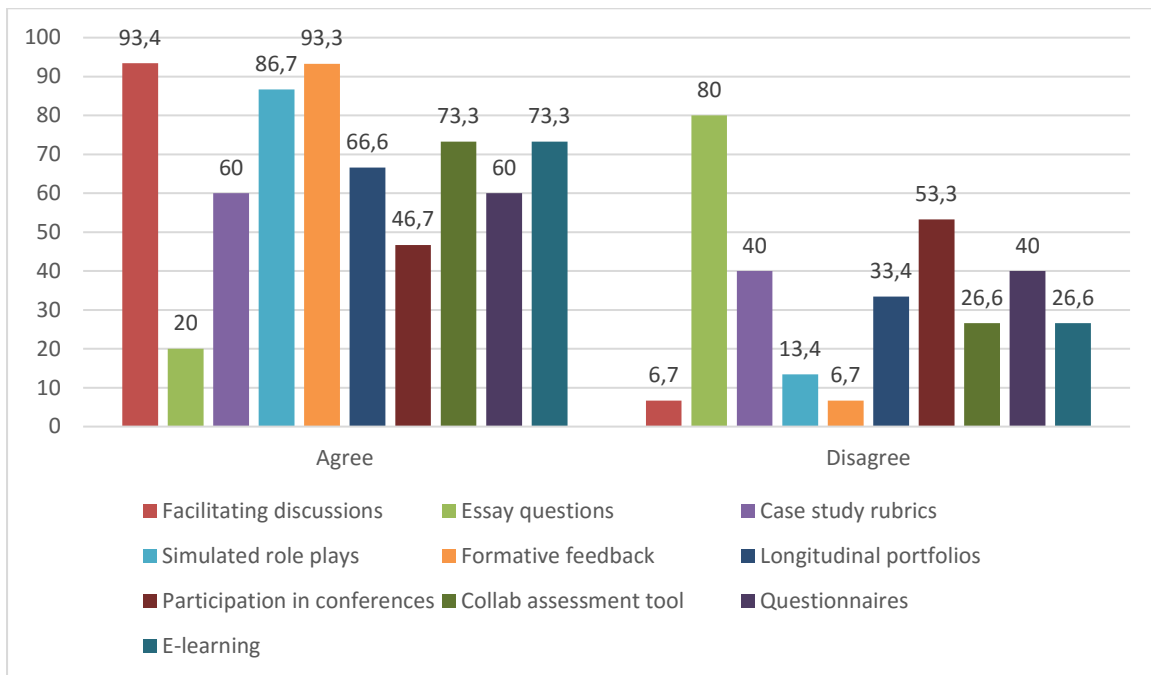


Figure 5.16: Values/Ethics for Interprofessional Practice



5.6 Discussion

5.6.1 Activities used to Develop Interprofessional Competencies

Considering the above assortment of activities, it is evident that similar activities can be used to instil more than one competency, for example, case studies that mention interprofessional communication, patient/client/family/community-centred care, role clarification, interprofessional conflict resolution and values/ethics for interprofessional practice. Another example is role play that can be used to develop the core competencies of role clarification, collaborative leadership, interprofessional conflict resolution, and values/ethics for interprofessional practice. However, when considering such overlap, it could appear repetitive and confusing in nature when designing new IPE activities and curricula. Barr, Koppel, Reeves, Hammick and Freeth (2005) provide some guidance on how to classify different learning activities that are frequently used in IPE. They state that using different methods in combination with each other can be very advantageous for students. The classification is as follows and the results are discussed accordingly:

- i) Exchange-based learning, e.g. case studies and debates
- ii) Action-based learning, e.g. workshops, problem-based learning, collaborative enquiry and continuous quality improvement (CQI)
- iii) Observation-based learning, e.g. joint visits to a patient by students from different professions, shadowing another profession
- iv) Simulation-based learning, e.g. role-play, games, skills labs and experiential groups
- v) Practice-based, e.g. co-location across professions for placements, out-posting to another profession and interprofessional training wards
- vi) E-learning, e.g. reusable learning objects relating to the above
- vii) Blended learning, e.g. combining e-learning with face-to-face learning
- viii) Received or didactic learning, e.g. lectures.

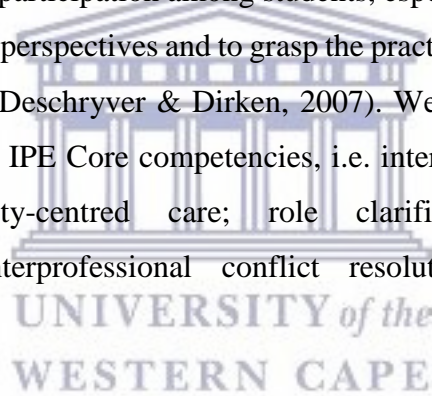
The following main activities will be discussed that were highlighted by the expert panel and were common to most of the IPE core competencies: case studies, joint clinical placements, simulations, role plays and workshops/discussions.

5.6.1.1 Case studies

Case studies can be considered as a problem-based learning approach and classified under exchange-based learning, according to Barr, Koppel, Reeves, Hammick and Freeth (2005). Bonney (2015) highlights several advantages of using case studies as a teaching strategy. Firstly case studies improve the development of the higher levels of Bloom's taxonomy of cognitive learning, which moves beyond not only recalling knowledge, but includes analysis, evaluation, and application. Secondly, case studies facilitate interdisciplinary learning and can be used to facilitate connections between specific theory and real-world societal issues and applications. Case studies have the ability to increase student motivation to participate in class activities, which promotes learning and improves performance on assessments.

Students in groups can be presented with a well-structured problem or case study in which they have to work collaboratively in a once-off session of a week or longer duration, depending on the outcomes of the session. During discussions they share ideas, identify key issues and pose questions to team members to follow, up either individually or together as team. Well-

structured problems in case studies can stimulate interest and critical thinking, encouraging active learning among team members. An effective facilitator will support the learning process rather than act as a source of information for the group. The group process should regularly be monitored by both participants and facilitator. Sefton (2009) states that a case study that is typically concentrated on a patient or a family, has been proven to initiate and stimulate learning among students. The author further states that the presentation of the case study by the group can be undertaken in any format, ie. paper, computer, film or video. It is further suggested by Sefton (2009) that the group does not exceed ten students and that the case study should stimulate team members to explore basic scientific and clinical mechanisms together with social, psychological, ethical or professional issues. Furthermore, it is suggested that students and facilitators should undergo initial training and should receive ongoing support to understand and apply the process effectively. Case studies lends itself to being open-ended; it allows for realistic problems to be used to stimulate interdisciplinary discussions; promotes critical thinking, learning and participation among students, especially in terms of their ability to view an issue from multiple perspectives and to grasp the practical application of core course concepts (Yadav, Lunderber, Deschryver & Dirken, 2007). Well-structured case studies can include and develop all seven IPE Core competencies, i.e. interprofessional communication; patient/client/family/community-centred care; role clarification; team functioning; collaborative leadership; interprofessional conflict resolution and values/ethics for interprofessional practice.



5.6.1.2 Workshops

Workshops are classified under action-based learning (Barr, Koppel, Reeves, Hammick & Freeth, 2005). The advantages of workshops as a teaching strategy are best described by Eison and Stevens (1995). Workshops demonstrate modern principles of teaching such as active engagement of the learners. They provide opportunities for the interaction that enables the teachers to connect the material to the context of the learners. They provide an opportunity for group interaction, which is important for trainees who are becoming increasingly isolated in their work (Eison & Stevens, 1995). With regards to workshops, students need opportunities to practise working in interprofessional teams in order to develop competencies that will enable them to practise interprofessionally. When planning these workshops, it is suggested that

student preparation and attendance should be a requirement, allowing for a greater success of the workshop (VanKuiken, Schaefer, Hall & Browne, 2016). In most cases, students are often unaware of the role of the other team members from the various disciplines. It is therefore, a sensible suggestion for all participating students to do some preparation beforehand, in the form of assignments or readings, to obtain the same baseline knowledge on the interprofessional roles and responsibilities of all disciplines that will be represented at the workshop. One mechanism to get buy-in from faculty is to invite new or non-engaged staff members to attend these workshops with students and, in turn, support student preparation. Once these staff members are convinced of the benefits of using workshops as a teaching strategy, it should become easier to develop the learning outcomes to build the appropriate interprofessional core competencies. Barr, Freeth, Hammick, Koppel and Reeves (2000, p. 24) support the benefits of workshops with students, "...change attitudes, reduce stereotyping, enhance communication, common objective setting, and action planning, and improve knowledge of professionals' respective roles." Bolden and Lewis (1990) posits that workshops often claim that changes in knowledge are reported by participants, but frequently it is the ability to work as part of a team that is enhanced. According to the expert panel, the core competencies that can be developed through action-based learning (workshops) are: interprofessional communication, role clarification, team functioning and interprofessional conflict resolution.

5.6.1.3 Simulation based activities

There are two activities classified under simulation-based activities, role plays and simulations. Simulations provide students of all disciplines a safe space to interact with each other collaboratively, as well as opportunities for a novice's eventual transition to becoming an expert. Simulated activities provide students with an opportunity to explore and appreciate the roles of other health professionals. During simulations, students have the opportunity to learn, make errors and not to dread compromising patient safety. Fowler-Durham and Alden (2007) confirm that simulation intends to mimic reality whilst offering a skills-based clinical experience in a safe and secure setting. Hovancsek (2007, p. 3) describes the aim of simulation as 'to replicate some or nearly all of the essential aspects of a clinical situation so that the situation may be more readily understood and managed when it occurs in reality in clinical practice'. Furthermore, crucial aspects of

simulation education are repetitive and consolidate learning and improve competence (Issenberg et al., 2005; Hogg et al., 2006; Kardong-Edgren et al., 2008), using feedback from a facilitator together with debriefing (Fanning & Gaba, 2007; Kuiper et al., 2008). According to the expert panel, the core competencies that can be developed through simulation-based activities are role clarification, team functioning, interprofessional conflict resolution and values/ethics for interprofessional practice.

Russell and Shepherd (2010) state that role plays and simulations function as learning tools for teams and groups or individuals, as they can either engage with each other online or face to face. Learning occurs through exploration whereby the power ratios in teaching and learning relationships between students and educators can be viewed through the character or personality they are articulating in a particular setting. Students can be actively involved in both self and peer assessment and obtain ongoing formative feedback. Alvear (2006) gives the following reasons why role play can be effective as learning strategy; it increases learning retention, it is fun, it encourages hands-on learning; enables brainstorming and team building; increases empathy and tolerance. In addition, it allows for evaluation of new techniques without risk; allows for analysis of problems from various perspectives, increases self-confidence; it is low cost and can be performed anywhere. The University of New South Wales (2016) confirms that scenarios during role plays can be scaffolded, progressively increasing in complexity to ensure that students reach the necessary level of competence. According to the expert panel, role play can be used to develop the core competencies of role clarification, collaborative leadership, interprofessional conflict resolution and values/ethics for interprofessional practice

5.6.1.4 Joint clinical placements

Joint clinical placements are categorised under practice-based learning according to Barr, Koppel, Reeves, Hammick and Freeth (2005). Joint clinical placements are a vital part of undergraduate education, allowing students to transform theory into practice by engaging in ‘real-life’ experiences to strengthen the academic programme content covered at the institution. Practice-based learning is normally credit-bearing and accounts for compulsory clinical hours together with classroom-based activities. Koh (2002, p. 41) warns that students who are unable to link theory and practice could possibly be left ‘floundering, lacking in confidence and

disenchanted, with some being forced to leave...’ Student experiences in practice placements can also improve student healthcare workers’ motivation and develop their professional identities (Baglin & Rugg, 2009). The core element of a clinical placement is that learning occurs by doing, since problems associated with clients/patients are placed in context and critical thinking can be developed (Nolan, 1998). According to the expert panel, the core competencies that can be developed through practice-based learning (joint placements) are: interprofessional communication, patient/client/family/community-centred care, role clarification, collaborative leadership and values/ethics for interprofessional practice.

5.6.2 Assessment Activities

The main suggestions given by the expert panel on assessment methods aligned to the suggested activities are portfolios, reflection and the development of appropriate rubrics which will be discussed below.

5.6.2.1 Portfolios

Portfolios are ideal as an assessment tool as it allows for critical analysis of its contents, which is a reflection of a particular student/group/community. They can therefore be considered as multipurpose instruments since they can be used for assessments, monitoring and planning, reflection, learning, and for personal development (Van Tartwijk & Driessen, 2009). Portfolios have evolved over the years from a file with loose pieces of paper/photos/diagrams to highly organised files demonstrating competencies. Portfolios are known to stimulate reflection, as students are often required to look back on work they have done and analyse what they have or have not achieved and the reasons for this. Portfolios are often compiled over a long period of time to allow a sufficient interval in which collect information and to reflect on the knowledge that has been gained from these experiences. Brown (1995, p. 3) defines a portfolio as “A private collection of evidence, which demonstrates the continuing acquisition of skills, knowledge, attitudes, understanding and achievements. It is both retrospective and prospective, as well as reflecting the current stage of development and activity of the individual.” This definition proposes that a portfolio has the potential to integrate material from various sources and

has the ability to express to others the qualities, competencies and abilities of the owner, as well as providing an indication of possible development. Students can sort the evidence in their portfolios into sections corresponding to the different competencies to be assessed and use captions to explain what the evidence shows about a specific competency, since many medical curricula are based on competency criteria (Van Tartwijk & Driessen, 2009). Portfolios as assessment tools, are linked to the core competencies of: interprofessional communication; patient/client/family/community-centred care; role clarification; team functioning; collaborative leadership; interprofessional conflict resolution; values/ethics for interprofessional practice.

5.6.2.2 Reflection as an assessment tool

Sanders (2009) states that many assessments include ‘levels of reflection’ and that this hierarchical model is based on the notion of depth of reflection. Superficial reflection is considered to occur when there is only a report of events but deeper reflection includes a ‘stepping back’ from events and actions with evidence of the encounter and possible change to current views and perceptions. This deeper level is equivalent to ‘transformative learning’ taking place. Reflection can be considered as a purposeful critical analysis of knowledge and experience in order to achieve deeper meaning and understanding of a specific body of information. Reflection cannot be seen in isolation from reflective learning and reflective practice. Sanders (2009, p. 685) concurs by stating “Reflective learning has the intention of improving learning and when this happens in the context of working with the ill-defined problems of professional practice, it is often called reflective practice.” However, this intended ‘learning’ is often not well defined. In a study done by Morison and Jenkins (2007) on reflection, students felt that learning together in both lectures and on clinical placement allowed them to gain optimum understanding on their own and others’ roles and that the real-world experience helped them to appreciate the importance of teamwork and communication skills. Reflection, critical reflection and understanding has been connected to deep learning approaches as compared to surface learning in literature (Leung & Kember, 2003; Biggs, Kember & Leung, 2001; Kember et al., 2000). Mann, Gordon & MacLeod (2009) confirm that professional competencies can be assessed through reflection and that different levels of reflection should be established for each year level. According to the expert panel, reflection

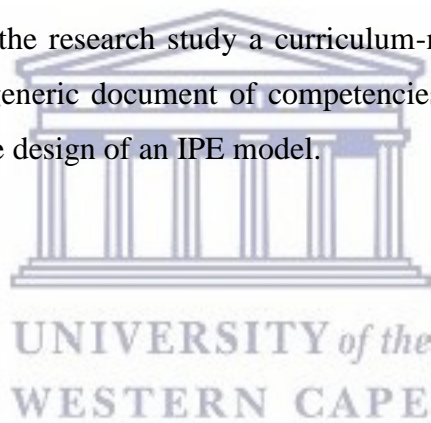
as an assessment tool can be linked to the core competencies of interprofessional communication; patient/client/family/community-centred care; role clarification; team functioning; collaborative leadership; interprofessional conflict resolution; values/ethics for interprofessional practice.

5.6.2.3 Rubrics

The third assessment method highlighted by the expert panel is the use of rubrics. Rubrics are a good indicator to students of what aspects of their performance will take priority and how marks/percentages will be allocated to specific tasks for assessment purposes. The use of rubrics in assessments offers a means to provide the desired validity in assessing complex competencies, without forfeiting the need for reliability (Morrison & Ross, 1998; Wiggins, 1998). When designing rubrics, Malini (2011) strongly suggests that assessors ensure that the scoring criteria reflect the desired core competencies that would suggest success in curriculum design and practice. The scoring/rating of rubrics are descriptive scoring schemes that are developed by educators or others (clinicians/supervisors/peers) to guide the analysis of written work or practical work in terms of a process towards students' efforts (Brookhart, 1999). The author warns that rubrics are not checklists. Instead, they should be considered as the development of criteria and rating scales for evaluation of the written work or practical demonstrations in compliance with these criteria. Nitko (2001) distinguishes two types of rubrics: holistic and analytic. Holistic rubrics are when the educator scores the overall process or product of a student as a whole, without assessing the separate components. On the other hand, an analytic rubric requires the educator to score the separate, individual parts of the student's product or performance first, and then add up the individual scores of each section to obtain a final total. The advantage of using a scoring rubric rather than weighted scores is that scoring rubrics provide an explanation of what is expected at each score level (Moskal & Leydens, 2002). According to the expert panel, the use of rubrics in assessment can be linked to the core competencies of: patient/client/family/community-centred care; role clarification; team functioning; collaborative leadership; interprofessional conflict resolution; values/ethics for interprofessional practice.

5.7 Conclusion

This study used a Delphi approach to identify teaching and assessment strategies that aim to develop interprofessional competencies in undergraduate healthcare students. These identified strategies will form a crucial aspect in developing the IPE model. The learning outcomes in the IPE curriculum need to be clearly outlined and linked to each respective year level in terms of the readiness for interprofessional learning. There is growing evidence that intensive approaches to learning are more likely to be connected with higher quality learning outcomes (Prosser & Trigwell, 1999). An IPE model will allow for flexible application of these learning outcomes that are both challenging and reflective of the cognitive level of learning across the learning continuum. This model will only be successful if it takes into account the challenges highlighted with regards to the readiness for interprofessional learning in the Understand Phase of this research study, ie. gender, discipline and year level. In order to understand these outcomes across the learning continuum, a curriculum-mapping exercise can be done to assist faculty. In the next phase of the research study a curriculum-mapping process is described towards the attainment of a generic document of competencies and graduate attributes that could inform curriculum in the design of an IPE model.



CHAPTER SIX

PHASE 2: UNDERSTAND

6 CURRICULUM MAPPING: GRADUATE ATTRIBUTES AND INTERPROFESSIONAL CORE COMPETENCIES

6.1 Introduction

The role of the higher education sector has become increasingly valuable in developing generic skills for both government and industry and for the institutions themselves (Bath, Smith, Stein & Swann, 2004). This evolving significance of generic skills, or graduate attributes, in higher education has been influenced by, amongst other factors, the following three elements: the popular perception that education is a lifelong process; a greater emphasis on the relationship between education and the employment of graduates; and the development of outcome measures as a part of the quality measure (Cummings, 1998).

Bath, Smith, Stein and Swann (2004) state that some academics might not be of the opinion that graduate attribute development is part of their teaching responsibilities and may believe that this is best taught by means of additional courses. However, the viewpoint of the literature is that graduate attributes need to be taught within a discipline, integrated and embedded in a curriculum. This current focus on graduate attributes is complemented by not only the adoption from institutions about the attributes that their graduates will or do achieve, but that there appears to be an active focus at grassroots level to ascertain and map the opportunities for graduate attribute development across courses within a specific field of study. The aim of such a process is explicitly to highlight to students, academics, management and external stakeholders the ongoing support and opportunities for the development of the higher education institution's adopted graduate attributes. Considering this important role that mapping of graduate attributes plays in curriculum development and quality monitoring, is it enough to authenticate the curriculum and the opportunities therein for graduate attribute development? Bath, Smith, Stein and Swann (2004) remind us to query whether there is alignment between

what is adopted, what is endorsed and what students experience and learn? Another question to consider is: how would we know when that alignment exists?

A task team at UWC perused several sets of graduate attributes and developed a unique set of attributes that were based on a commonly used framework (Barrie, 2004) and the mission and vision of UWC. The graduate attributes are:

- i) **SCHOLARSHIP:** A critical attitude towards knowledge:
- ii) Within a rapidly changing environment, it is expected of UWC students to engage with various challenges in society and confidently and effectively communicate the knowledge that they have acquired.
- iii) **CRITICAL CITIZENSHIP AND THE SOCIAL GOOD:** A relationship and interaction with local and global communities and the environment:
- iv) UWC strives to produce graduates that exhibit good leadership skills and aim to contribute to the ethics of care and social justice.
- v) **LIFELONG LEARNING:** An attitude or stance towards themselves:
- vi) UWC graduates should continually strive to expand their understanding of the world and their environment through Lifelong Learning and critical reflection.
- vii) **CREATIVE AND COLLABORATIVE PROBLEM SOLVING:** Deep and broad engagement: UWC graduates should be innovative and bold T-shaped thinkers and problem solvers. They should be knowledgeable within their own field of expertise and have the ability to collaborate across disciplines to solve complex problems.

These graduate attributes are supported by several overarching skills and abilities, namely: enquiry-focused and knowledgeable; critically and relevantly literate; autonomous and collaborative; ethically, environmentally and socially aware and active; skilled communicators; and interpersonal flexibility and confidence to engage across the differences (Final Integrated Graduate Attributes and Teaching & Learning Plan Document, 2015).

As we reflect, IPE initiatives in academic institutions have been employed as “add-on” experiences, which are often perceived as less valuable than core curricula (Brashers, Peterson, Tullmann & Schmit, 2012). This creates an unwillingness for higher education institutions to

devote resources and student and faculty time, resulting in less IPE initiatives being sustained over time. If IPE is to be valued and sustained, it needs to be integral to learning core clinical skills in a variety of settings. In working towards this goal, existing IPE initiatives need to be reviewed, articulated and aligned to IPE core competencies. Brashers, Peterson, Tullmann and Schmit (2012) suggest that comprehensive curriculum reviews be undertaken in all participating departments/schools to enhance existing courses, develop IPE objectives for each course and identify areas where new IPE experiences are required to instil the desired IPE core competencies. The authors suggest that a supporting academic unit could address specific challenges at the different year levels by exploring IPE strategies for both curricular and extracurricular learning, with the ultimate aim of developing new, clinically relevant IPE experiences across the learning continuum.

Mashiya (2015) states that concerns about the employability of graduates globally, have led to the investigation by higher education institutions (HEIs) into the development of graduate attributes (GAs). Graduate employability has become a contemporary issue, not only for higher education but also for industry, accrediting bodies and governments (Treleven & Voola, 2008). Researchers commonly refer to GAs as key skills (Drew, Thorpe and Bannister, 2002); generic attributes (Wright, 1995); key competencies (Mayer, 1992); transferable skills (Assiter, 1995); employability and soft skills (Business, Industry and Higher Education Collaboration Council, 2007). GAs are defined as the qualities, values, attitudes, skills and understanding that students should have acquired along the continuum of learning until they conclude their studies (Bowden, Hart, King, Trigwell & Watts, 2000). These GAs are aimed at preparing students for future employment and as critical and responsible citizens, contributing to the social and economic well-being of their communities (UWC Charter of Graduate Attributes and Strategic Plan for Teaching and Learning Document, 2009).

In the same light, when comparing GAs to competencies, Caccia, Nakajima, Scheele and Kent (2015) differentiate between the term competence which is considered to be “the ability to do something successfully” and competencies by which general attributes that may be components of an ability to execute a specific activity can be observed and assessed. Both competencies and attributes have to be acquired by future health professionals by the time they complete their

undergraduate training. These competencies and graduate attributes have to be embedded in the curriculum and staggered across the learning continuum in order to be measured and monitored before a student can graduate from a specific programme. The term ‘milestones’ has been used by Caccia et al. (2015) to refer to the abilities expected by health professions in defined stages of their development. Milestones serve as a learning roadmap for students, and they allow academic staff to track progression from a dependent to an independent learner.

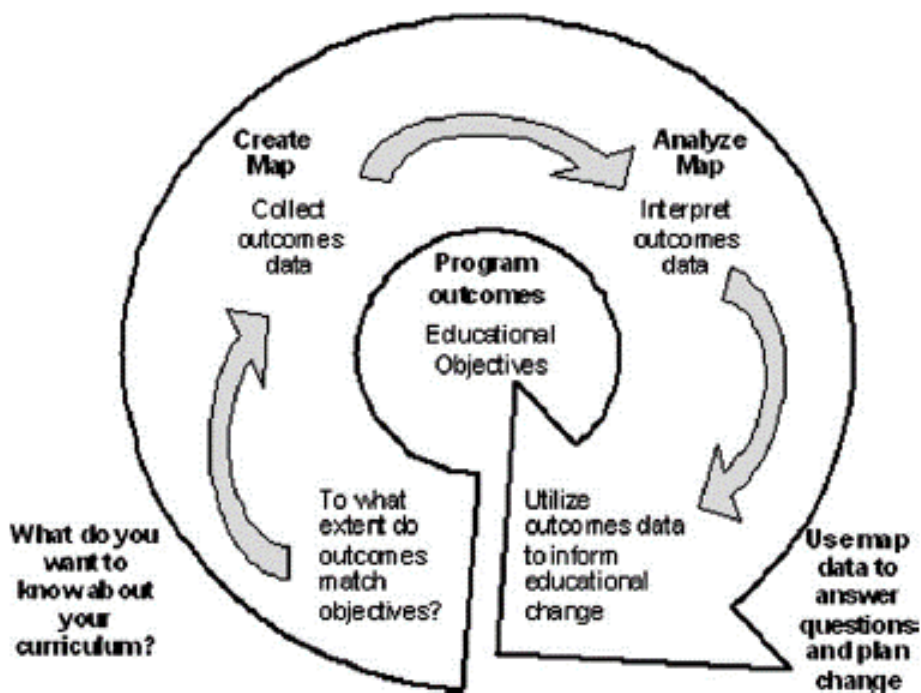
Considering the above, curriculum-mapping is a method of plotting curricula to detect and highlight gaps in academia, redundancies and misalignments for purposes of refining the overall coherence of a process or set of outcomes (Abbott, 2014). Plaza, Draugalis, Slack, Skrepnek and Sauer (2006) explain that curriculum mapping demonstrates the links among the different key components of the curriculum and examines them from various perspectives. This chapter aims to highlight the overlap and possible gaps between the University of the Western Cape’s Graduate Attributes (GA) and Interprofessional Core Competencies being implemented in the FCHS at UWC. An understanding of the overlap and the gaps will assist in the development of an appropriate and relevant IPE model for the FCHS.

6.2 Methodology

6.2.1 Curriculum mapping

Kelley, McAuley, Wallace and Frank (2008) state that the process of curricula-mapping should ideally be used not only to satisfy accountability requirements, but also to inform curricula change and improvement. Figure 1 below presents Maki’s (2004) Original Assessment Loop with the Mapping Loop overlaid in bold. It is a well-designed original assessment loop on which the activities of curricula mapping have been overlaid to show their correspondence with the original concept. This figure illustrates the critical point that, in order for the efforts of mapping to make modifications to the outcomes of student learning, the data collected and mapped must be used to inform change at the programme and module level. Therefore, mapping should be embarked on with the objective of gathering meaningful information to be used for curricula transformation, thus providing a document- driven mechanism for informing programme alterations.

Figure 6.1: Maki's Original Assessment Loop with the Mapping Loop overlaid in bold.



6.2.2 Curriculum-mapping process

The following phases were undertaken in the curriculum-mapping process, as outlined by Kelley et al. (2008):

Step 1: Planning

The Education White Paper emphasises that South African higher education institutions should be generating ‘graduates with the skills and competencies that build the foundations for lifelong learning. This should include critical, analytical, problem-solving and communication skills, as well as the ability to deal with change and diversity, in particular, the tolerance of different views and ideas’ (Education White Paper 3 - A Programme for Higher Education Transformation, 1997). Thus, in planning, it was felt by the leadership of the FCHS that there was a need to ensure that we understand the link between graduate attributes and the IPE competencies so that there is no duplication of efforts in trying to instil it in the students.

Step 2: Creating the code

Kelley et al. (2008) state that for each question generated in Step 1, a system or standard of measurement, as well as a process for codifying that information, must be established. These metrics and codes must be carefully and clearly defined as they need to be communicated to staff who will engage in the curriculum-mapping exercise.

Step 3: Faculty input and data gathering

Kelley et al. (2008) state that, during this phase, the task team needs to decide how to best gather the information described in step 2. It is also at this stage that workshops or training needs can be identified for faculty staff before embarking on the curriculum mapping exercise. Before deciding on the best approach to take for training, the following questions need to be asked:

- How will the training occur?
- Will it occur at faculty/departmental retreats?
- Who will be asked to participate?

The authors report that it may make sense to limit participation initially to course convenors/heads of departments, depending on the structure and delivery of courses. Irrespective of the approach chosen, the code needs to be explained clearly or defined for those who are completing the mapping process. Timeframes need to be set for each process to ensure that the exercise as a whole is completed.

Step 4: Analysis of map

During this stage, data are compiled and shared with members of the task team. The facilitator engages with both documents and prepares a table to highlight the overlap. The task team further engages with areas in the documentation where there is no initial overlap. This exercise that is presented to the task team, could be seen as a pilot study to allow for further engagement at a departmental level with their discipline-specific curriculum. The following questions need to be answered when this stage is reached:

- Does your course address all the outcomes or are there outcomes that are not covered?
- At what level of alignment would you say that the learning opportunities in your course support achievement of the outcomes?
- What types of learning opportunities are used in your course to address those outcomes?
- How do you assess that students have learned the material related to those outcomes?

Step 5: Implement the changes

At this stage the answers to the questions have been identified and a list of actions have been generated. Table 5 above highlights how the two documents align with each other and presents a plan to incorporate these changes into the curricula of the faculty. A follow-up meeting with the task team ensures that the map is part of a process of continuous curricula improvement and not simply an exercise in data gathering.

6.3 Results

The results for each of the above steps will be reported below:

Step 1: Planning

The University of the Western Cape (UWC) responded to the request by the South African Qualifications Authority (SAQA) to develop its own set of graduate attributes which departments were requested to embed in their curricula. In the same time period, the Faculty of Community and Health Sciences (FCHS) adopted the Canadian Interprofessional Health Collaborative's (CIHC, 2010) framework as a comprehensive set of competencies to instil in students as part of their undergraduate education programmes. It made sense to engage staff in both documents and to map out the overlap with the aim of infusing these documents into one. During this step a seminar was planned with staff to introduce a framework for mapping their curriculum in alignment with the GAs' and IPE core competencies. The following questions served as a guideline in the planning process. which was adapted from Kelley et al. (2008):

1. What learning outcomes related to the competencies of IPE are covered in which year-level in each discipline?
2. What learning outcomes are related to developing graduate attributes?
3. Which courses contribute to the accomplishment of each of the outcomes?
4. To what extent do particular courses contribute to a particular outcome?
5. What teaching methods are used in each course?
6. How do we measure what students learn relative to each of these outcomes? How is it assessed?
7. What are the gaps identified?

Step 2: Creating the code

During this phase the information below was collected to answer the questions above. This step was essential in the design of the IPE model in terms of aligning curricula along the continuum of learning:

- Year level
- Identify the competencies/graduate attributes
- Learning outcomes
- Learning opportunities
- Assessment



The following code (Table 6.1) was developed to answer questions one and two above:

Table 6.1: Code for questions 1 and 2

Competency	Course	Introduced	Reinforced	Emphasized
------------	--------	------------	------------	------------

Interprofessional Communication				
Patient/Client/Family Community-Centred Care				
Role Clarification				
Team Functioning				
Collaborative Leadership				
Interprofessional Conflict Resolution				

Table 6.2 was developed to answer questions three and four in the curriculum-mapping process

Table 6.2: Code for questions 3 and 4

Level 0	Level 1	Level 2	Level 3
Where there is no relationship between the course and the IPE competencies ;	Where there is an indirect relationship between the course and the outcome. In this case, the outcome itself is not the focus of the course, but at least one element of the course serves as a building block to the achievement of the final outcome.	Where a more direct relationship exists between the course and the outcome. A mixture of course elements support the final achievement of the outcome, but the final integration of the knowledge, skills and attitudes necessary for its achievement, are not accomplished in this course;	Where a direct relationship exists between the course and the outcome. At least one element of the course focuses specifically on the complex integration of knowledge, skills and attitudes necessary to perform the outcome.

Table 6.3 was developed as a checklist to answer question five which was centred on pedagogy:

Table 6.3: Code for question 5

How is the module taught? (✓ all that applies)	
	Lectures
	Lectures and discussions

	Case studies
	Experiential learning
	Practicals
	Independent studies
	On-line
	Small group-work
	Other: (specify)
	1
	2
	3

The code for question six was indicated in Table 6.4 below:

Table 6.4: Code for question 6

Level of assessment	✓
Building blocks, where students are assessed primarily on recall of information rather than ability to apply or synthesise that knowledge, skill and/or attitude.	
Application or synthesis, where students are assessed on their ability to apply and synthesise knowledge, skill, and/or attitude.	
Performance, where students are assessed based on their ability to perform the knowledge, skill, and/or attitude.	

By working through each code, the gaps in the curriculum should become evident and indicate the areas that need to be integrated into the curriculum.

Step 3: Faculty input and data gathering

In light of the questions posed at this stage of the curriculum-mapping exercise, participants gave the following input:

- How will the training occur?

Training will occur on a regular basis to ensure that all staff are equipped with the knowledge and skills to integrate attributes and competencies in all curricula. This can be done at departmental level upon request or in a workshop format at faculty level.

- Will it occur at faculty/departmental retreats?

Retreats can be an additional method to get support and cooperation from staff, together with having a research basis with the outcome of publications.

- Who will be asked to participate?

All staff need to be included, i.e. administrators, year-level co-ordinators, lecturers, clinical supervisors, clinical co-ordinators, heads of departments and clinicians.

Step 4: Analysis of map

Data of the pilot study is represented in Table 6.5 below in terms of how they aligned to each other:

Table 6.5: Alignment of IPE Core Competencies and Graduate Attributes

IPE Core Competencies	Graduate Attributes (2nd Tier)
Interprofessional communication	Skilled communicators
Patient/client/family/community-centred care	Enquiry-focused and knowledgeable
Collaborative leadership	Autonomous and collaborative
Interprofessional conflict resolution	Interpersonal flexibility and confidence to engage across difference
Values/ethics for interprofessional practice	Ethically, environmentally and socially aware and active
Role clarification	Critically and relevantly literate
Team functioning	

Core competencies and graduate attributes were colour-coded in terms of alignment, while those competencies and attributes that could not be aligned were not coded. By referring to Table 6.5, students should be able to incorporate and value, as a core team member, the input and the engagement of the *patient/client/family/community* to improve health outcomes. This can only be done with future health professionals who are able to create new *knowledge* and understanding of the complex challenges in society, through the process of research and *enquiry*. Future health professionals must be prepared to take on *leadership* positions and understand and practice leadership principles that support a *collaborative* practice model in

health settings. Leadership requires the ability to be able to *work, both independently and in collaboration with others*, with values and principles of openness, curiosity and a desire to meet new challenges. In order to do this, graduates should be able to *relate with people from various contexts* and have the emotional insight and imagination to understand the viewpoints of others. In so doing, they should be able to *positively and constructively address disagreements* as they arise. These graduates should have the skills, knowledge and attitudes to *work confidently* in a dynamic team, to lead where necessary and to solve the complex problems of society. Being professional implies that there are a set of *values, principles and ethical behaviour* which are adhered to both as a practitioner and interprofessional team member. Alignment with the appropriate UWC graduate attribute is a *demonstration of the knowledge of ethical, social, cultural and environmental concerns* relating to a specific discipline.

At the end of the table there are two core competences and one graduate attribute that cannot be aligned to each other. The core competencies are, role clarification and team functioning. These attributes require that students/practitioners should develop an *understanding of their own role and the roles of other* team members to develop appropriate health outcomes. In doing so, they should understand the *principles of teamwork* to foster collaborative practice. The remaining graduate attribute was critically and relevantly literate. With this attribute, graduates should be able to *pursue, determine, use and apply information* related to various settings effectively with all stakeholders. During step four in the research process, the core competencies and graduate attributes that had an area of overlap were agreed upon to produce generic competencies that could be embedded more easily in curricula of the FCHS. The competencies and graduate attributes that had no overlap were left for further discussion by the IPE representatives from each department.

Step 5: Implement the changes

Steps 1-4 will contribute to the development of the proposed model. Through the development of the IPE model the above integration will be incorporated into curricula in the faculty. Regular follow-up meetings with the task team will continue to ensure that the map is part of a process of continuous curricula improvement and not simply an exercise.

6.4 Discussion

This chapter describes the process followed to determine if IPE core competencies and graduate attributes are being integrated into the current curriculum. For the purposes of this discussion, the integration of these two documents will be referred to as Generic Competencies (GCs), as described by Yaacob (2012). GCs can be considered to include domains of learning outcomes that include competencies (Yaacob, 2012).

Only five of the graduate attributes and core competencies were found to have areas of overlap to form GCs. The remaining competencies and attributes could not be aligned by the task team and needed further discussion. The UWC graduate attributes comprise two tiers; the first tier has four holistic overarching qualities, enabling attributes that describes the 21st century graduate. The second tier comprises six overlapping clusters of abilities and skills further describing this T-shaped graduate. The second tier was used in the curriculum-mapping exercise. In future discussions with faculty IPE champions, consideration should be given to the new revised UWC graduate attributes which include a fourth enabling attribute from tier one, i.e. graduates should be creative and collaborative problem-solvers. When analysing this additional attribute, it refers to graduates being confident enough to take on the complex problems of society. In order to do this they need to be competent as professionals in their own discipline, yet have the ability to cross boundaries and work collaboratively with others to improve health outcomes of patients/clients/families/communities. When reflecting on this new overarching attribute, links can be formed with the IPE core competencies that were not previously aligned to the second-tier graduate attribute. In addition to this, the UWC graduate attributes cannot be seen in isolation from the UWC Institutional Operational Plan (IOP) of 2016-2020. The new IOP states that UWC will create opportunities for entrepreneurship (p. 15) for students, among other things. Entrepreneurship will require students and graduates to acquire new skills and abilities that should be added in addition to the existing graduate attributes. This area within the IOP reveals a current gap in the discussion of aligning graduate attributes and IPE core competencies and will require much discussion in future.

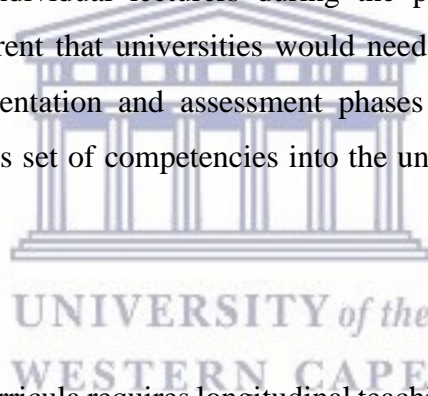
When referring to literature, Shaffer and Thomas-Brown (2015) state that undergraduate curricula are very often content-heavy and, integrating new content related to interprofessional education, require the adjustment of content and coordinated curricula changes that may seem challenging. As a result, these challenges of coordination across disciplines can inhibit the development of significant interprofessional learning experiences. Yaacob (2012) explains that the degree to which (GCs) provide an appropriate basis for integration into university courses depends mainly on two elements: (a) whether or not the competencies were ‘naturally occurring’ within the existing university’s curriculum; and (b) whether or not methods could be established to make those competencies explicitly recordable and assessable.

Considering that UWC was introduced to the concept of integrating graduate attributes into existing curricula during a Teaching and Learning retreat in 2011, many departments are still in the process of implementing this exercise. During 2016, the researcher presented two interprofessional core competency sets to an IPE task team representing faculty who decided to refer to the Canadian Interprofessional Health Collaborative’s (2010) six competencies as a reference point. Departments were tasked with embedding these interprofessional core competencies into their curriculum in addition to graduate attributes. This created confusion and difficulty in integrating two sets of competencies. The curriculum-mapping exercise was therefore necessary to combine the two documents through determining similarities in the qualities, values, attitudes, skills and understandings that were necessary for students to have developed by the time they graduate from their professional programmes.

Hager and Holland (2006) argue that ‘naturally occurring’ competencies provide a suitable basis for integration into existing university programmes. The teaching and learning focus is on how students learn best and GCs reflect significant aspects of initiatives to improve teaching and learning. These GCs require students to utilise different combinations in real-life situations if they are to be successful. GCs normally lead to good learning outcomes according to Hager and Holland (2006). As a result, by embedding the development of GCs into all courses, we can improve overall learning. Natural occurring GCs include competencies such as fluency in communicating learning experiences through verbal presentations. In this example, it is evident

that communication skills (i.e., one of the GCs) are ‘naturally occurring’ in the departmental professional course structures.

Research on the teaching and learning methods of GCs indicates that there is a strong and persistent link between the development of GCs by students and methods of teaching and learning (Yaacob, 2012). Previous researchers recommend strategies for explicitly assessing graduate GCs throughout the curricula employing an assortment of assessment methods. Thus, the lecturers need to ensure that students (Hart et al., 1999): (a) experience a range of learning opportunities; (b) have organised opportunities for reflection and engagement with other students (e.g. group activities) throughout courses; and (c) develop portfolios of their learning experiences from the commencement of their course programmes. Yaacob (2012) states that, ideally, the development of GCs for individual students should be integrated as a core component of the curriculum. The second matter of concern is the integration ability of GCs into university courses by individual lecturers during the planning, implementation and assessment phases. It is apparent that universities would need a mindshift in how lecturers handle the planning, implementation and assessment phases of teaching and learning to facilitate the integration of this set of competencies into the university courses by individual lecturers.

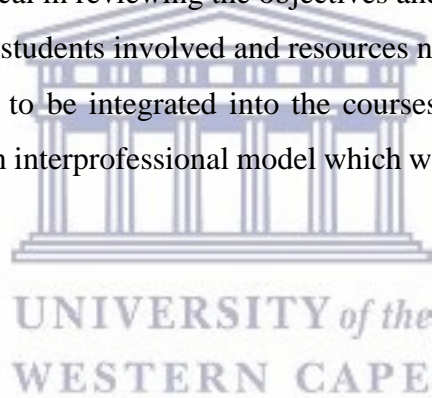


6.5 Conclusions

The embedding of GCs into curricula requires longitudinal teaching and continuous assessment of the progression of students and academics. Faculty development will play a critical role in bringing about transformation of changes to the curricula, requiring an understanding of the basic principles of teaching, learning and assessment, as well as the theories underpinning IPE and collaborative practice. The success of the curriculum alignment depends heavily on good communication, trust and respect underpinning the relationship between the administrators, support staff, lecturers, heads of departments and leadership of universities. An interdisciplinary approach to teaching and team work amongst lecturers should be adopted that would further facilitate the process of embedding GCs into curricula and, at the same time, develop a common understanding of the GCs. There is much progress to be made in the integration of graduate attributes and core competencies and ultimately embedding them into

curricula, and Thistlethwaith (2014) warns that assessment of competencies tends not to be well defined. Competencies in general tend to be broadly defined by medical boards and accreditation bodies, which are often abstract and socially constructed concepts that are problematic to translate into observable and therefore assessable behaviours in students.

The integration of generic competencies (GCs) into university professional courses has become the concerns of lecturers and students in most higher education institutions. In order for this integration to occur there needs to be a mindshift in teaching and learning practices from a teaching-centred and content-focused approach, to a student-centred and process-focused constructivist model of teaching and learning (Campbell et al., 2001). Secondly, the content of courses and assessment methods used need to be in alignment with each other. Thirdly, the ability of lecturers to both identify and integrate GCs into courses is crucial in assuring the integration ability of the GCs into such courses. Lastly, curricula revision through the process of curriculum-mapping is critical in reviewing the objectives and the learning outcomes of the courses to identify the type of students involved and resources needed in determining whether or not the set of GCs is able to be integrated into the courses. The following chapter will describe the development of an interprofessional model which was informed by the findings of the previous chapters.



CHAPTER 7

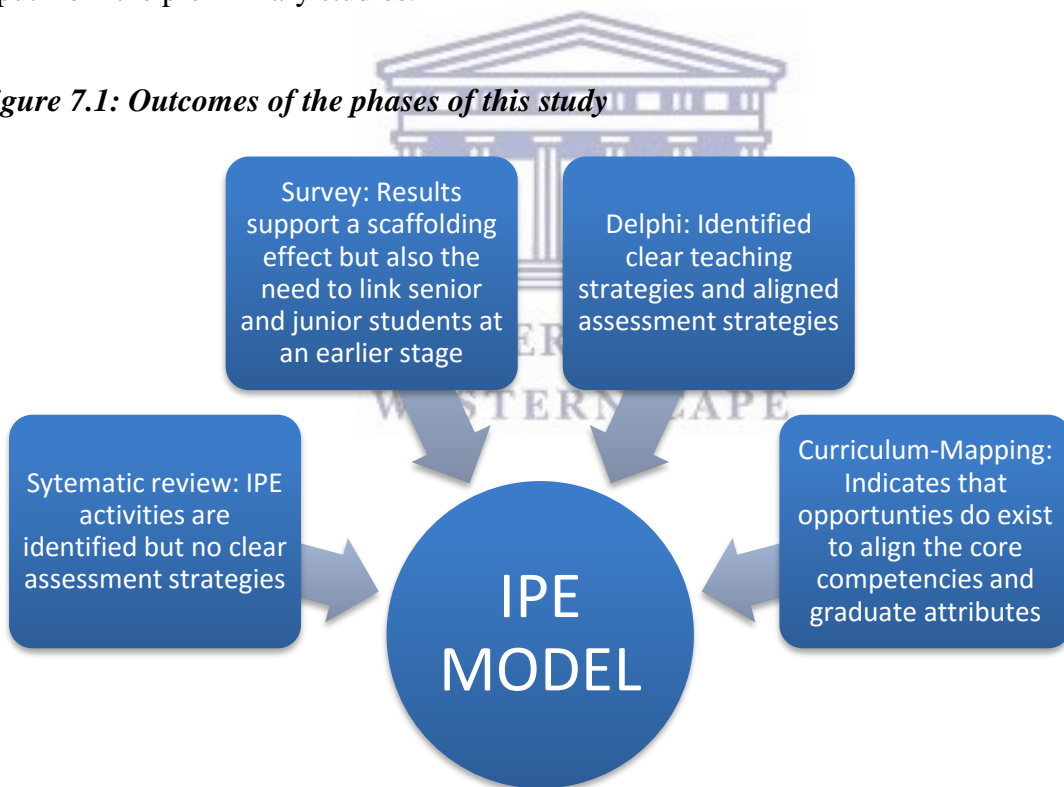
PHASE 4: CONCEIVE

7 INTERPROFESSIONAL EDUCATION AND PRACTICE MODEL

7.1 Introduction

Chapter Seven culminates in the fourth phase of the design research process. At the end of Chapter Six, a general competency set was developed through a curriculum-mapping exercise. These general competencies are presented below, summarising their activities and assessments. The chapter then describes how IPE curriculum can be scaffolded over the learning continuum in the FCHS. The aim of this chapter is to design an IPE model by using the outcomes of the phases of this research study (Figure 7.1), referring to appropriate theoretical frameworks and input from the preliminary studies.

Figure 7.1: Outcomes of the phases of this study



7.2 Background

Frantz and Rhoda (2017) state that IPE should be seen as a vehicle for bringing about change for improved healthcare, since it creates an opportunity to change the current methods used to educate future healthcare professionals, embark on research and engage communities. These changes will require universities to produce T-shaped graduates that are both extremely knowledgeable about their own profession, as well as skilled and willing to learn new skills and explore fields as part of their work/study for various reasons. Van Heerden (2013) clearly states that students need to become agents of change in order to address the complex and ever changing needs of society. In order to do this, students will be required to develop certain competencies which are aligned and facilitated with the concept of T-shaped graduates (Frantz & Rhoda, 2017). These competencies include graduate attributes as outlined in Chapter Six and will be referred to as General Competencies (GCs).

The Faculty of Community and Health Sciences (FCHS) has embarked on this journey by offering interprofessional education and practice exemplars to final year allied health students, in addition to core modules offered at first, second and third-year level. Three exemplars are highlighted by Waggie and Laattoe (2014): Interdisciplinary Community-based Practice module; Interprofessional Community-based Practice; and Interprofessional World Café. The Interdisciplinary Community-based Practice module includes a theoretical and service-learning component and is designed to meet discipline-specific, interdisciplinary and personal goals through the development and implementation of an interdisciplinary intervention care plan. The module involved collaboration between the university, the service providers and designated community agencies. The second exemplar, Interprofessional Community-based Practice, is offered in a community setting whereby students from various disciplines address a specific need of the community with an academic facilitator as part of their community practice rotation. The third exemplar, Interprofessional World Cafe' gives students an opportunity to dialogue around the core interprofessional competency domains through the use of case studies. The teaching and learning strategies across the three exemplars include didactic input, group work, role plays, practical development of a comprehensive interdisciplinary care plan, presentations, reflections, case studies, video clips, facilitation of small group discussions

and presentations. These strategies are in alignment with those identified by the expert panel in the Delphi exercise in Chapter Five.

Frantz and Rhoda (2017) categorise the FCHS as a faculty within a ‘resource-constraint university’ and highlight three specific concerns in terms of the implementation of interprofessional education (IPE) and interprofessional practice (IPP). The concerns include the lack of an explicit framework, (Waggie & Laattoe, 2014), challenges operationalising IPE and IPP, and the lack of critical mass in terms of human resources to drive IPE and IPP. Although there was a ‘lack of explicit framework’ for IPE, Frantz and Rhoda (2017) introduced the concept of a scaffolding approach to learning which provides guidance in terms of how IPE is being implemented at UWC. Within this approach, the learning outcomes are based on the six collaborative competencies of the Canadian Interprofessional Health Collaborative (2010). This scaffolding design (Figure 7.2) allows students to gradually move along the continuum of learning to become increasingly independent learners with a deeper understanding of IPE and IPP through an assortment of instructional techniques. Frantz and Rhoda (2017) offer Boyer’s model of scholarship (1997) to drive IPE and collaborative practice in the light of these being socially relevant to the context in which UWC finds itself.

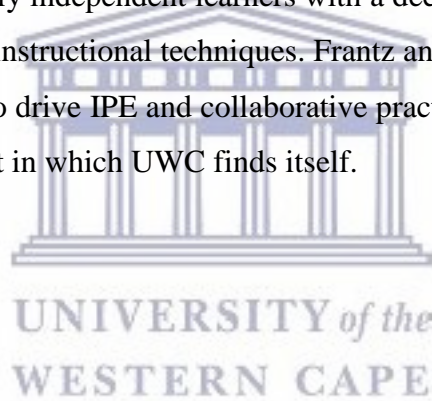
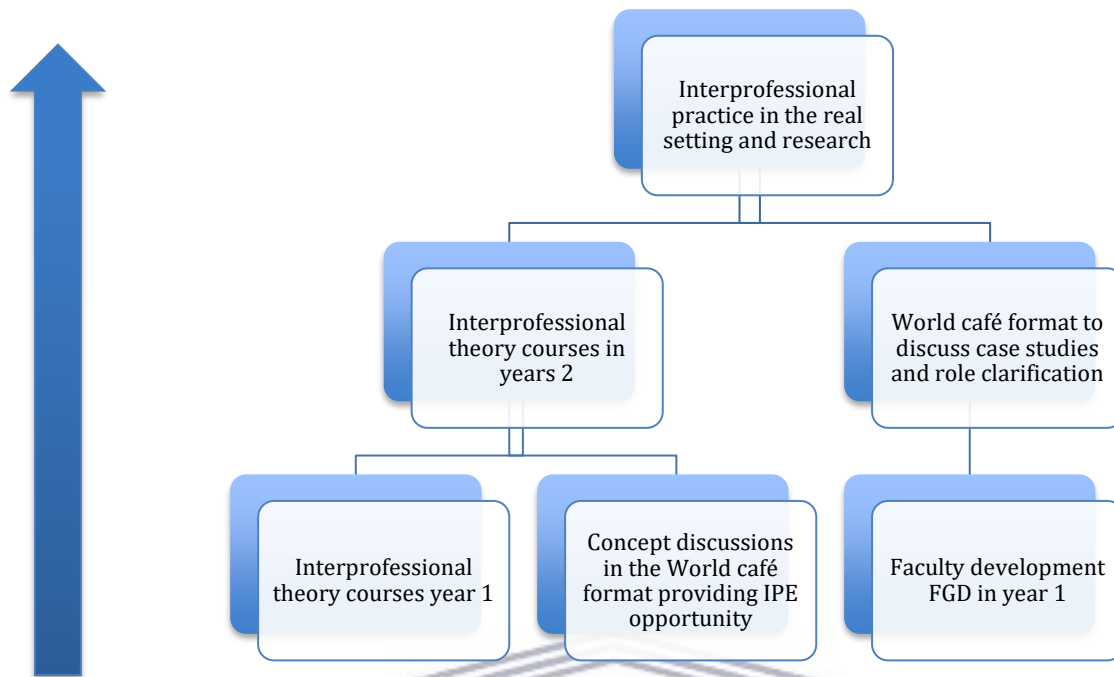


Figure 7.2: Scaffolding of the curriculum (Source Frantz & Rhoda, 2017)



Boyer (1997) explains that a scholar should be able to step back from his or her studies/research, seek connections, build associations between theory and practice and communicate this knowledge effectively to students. In reflection, the work of an academic can be thought of as having four separate domains, which nevertheless overlap. These domains are the scholarship of discovery; the scholarship of integration; the scholarship of application; and the scholarship of teaching. These domains are explained as follows:

The Scholarship of Discovery is the type of scholarship traditionally associated with research. This scholarship of discovery contributes to the body of knowledge by helping us to understand one remote part of reality in detail in the hope that this understanding can be generalised to some degree to a broader part of reality. Typically traditional research falls into two distinct genres: quantitative research and qualitative research. At UWC, the third year (scholarship of discovery) allows for the deepening of IPP knowledge and introduces research.

Boyer's Scholarship of Integration is "the attempt to arrange relevant bits of knowledge and insight from different disciplines into broader patterns that reflect the actual interconnectedness of the world" (Boyer cited in Jacobsen & Jacobsen 2004, p. 51). This scholarship stresses the need for interdisciplinary collaboration and requires that the critical analysis and review of knowledge be followed by the innovative production of views and insights in such a way that what is known speaks to specific topics or issues about a phenomenon.

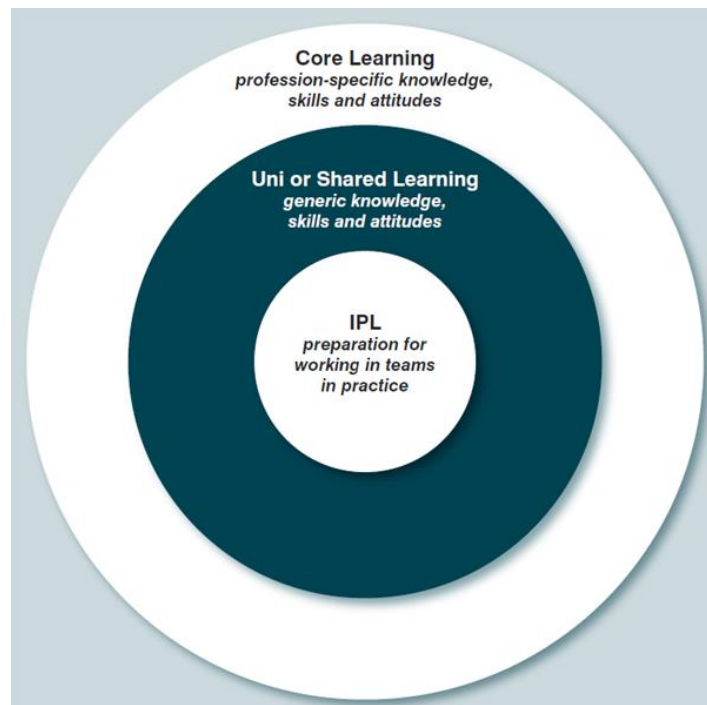
The Scholarship of Application is "the scholarship of engagement; seeking to close the gap between values in the academy and the needs of the larger world" (Boyer cited in Jacobsen & Jacobsen, 2004, p. 51). Here knowledge is applied to the solution of societal needs and practice. In most cases, knowledge stemming from the Scholarship of Discovery and the Scholarship of Integration enlighten the solutions to a particular phenomenon. The Scholarships of Discovery and Integration is often linked to the context of formal education. The Scholarship of Application may happen within formal education contexts, and is most often associated with other settings as well (Boshier, 2009, p. 6). At UWC, the second year (scholarship of application and integration) allows for the deepening of IPE knowledge and introduces IPP.

Finally, the Scholarship of Teaching is "the scholarship of sharing knowledge" (Boyer cited in Jacobsen & Jacobsen, 2004, p. 51). The Scholarship of Teaching encompasses the philosophical analysis of knowledge about teaching and learning. This knowledge base itself is the result of the Scholarships of Discovery, Integration and Application combining as "active ingredients of a dynamic and iterative teaching process" (Boshier, 2009, p. 5). At UWC, the first year (scholarship of teaching), the basic concepts of IPE, are presented through modules and activities such as world cafés.

Lennox and Anderson (2006) state that a model is designed to provide a practical, easily reproducible experience for students. The authors further emphasise that it is an ideal addition to the many traditional approaches to interprofessional learning such as competency based learning. To incorporate a model into existing interprofessional programmes provides students with an opportunity to apply and practice their interprofessional knowledge and skills in fieldwork settings with real clients, clinicians and other service providers. The Leicester Model

of Interprofessional Education (IPE), outlined by Lennox and Anderson (2006), is used as a guideline for this study. This model is ideal as it shows the context setting within the overall health and social care curriculum within the Faculty of Community and Health Sciences (FCHS). In Figure 7.3 below, the outer circle represents profession-specific learning and the middle circle refers to the core competences shared with other professions which can be learned as a shared learning experience or in uni-professional situations, for example, communication skills.

Figure 7.3: The context setting of the Model within the overall health and social care curriculum



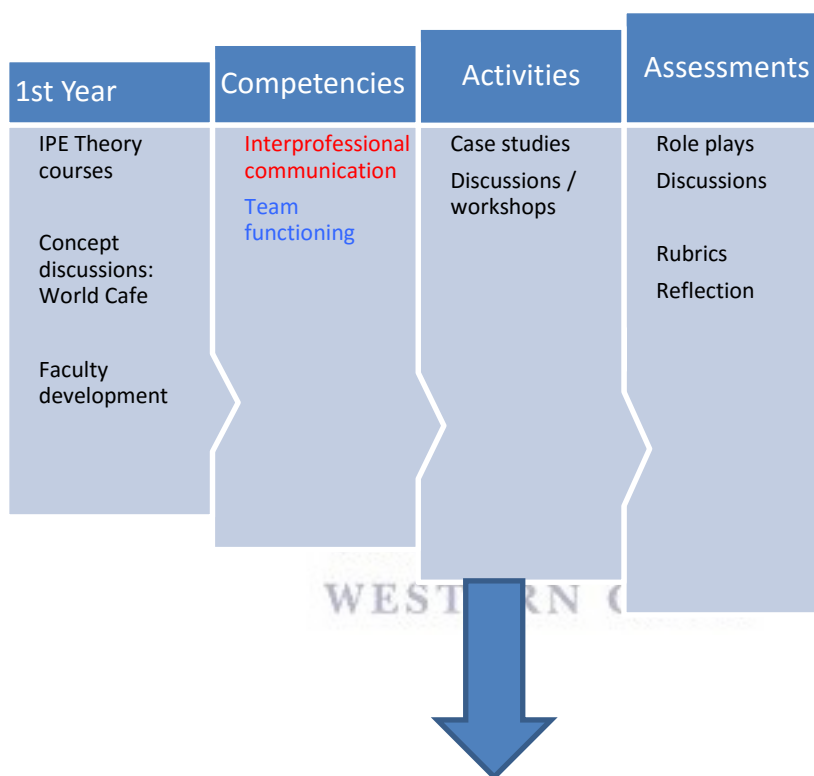
The inner circle represents interprofessional learning in which students learn about, with and from one another, to improve collaboration and the quality of care (CAIPE, 1997). The three circles represent, form the setting of the Model. The model is applicable to both undergraduate and postgraduate students, while the time commitment required is flexible and may vary from as little as two days or as long as is required. Lennox and Anderson (2006) assure that the model is built on a protected learning environment which is as close as it can be to a real-life setting. Undergraduate students gain an understanding into future practice whilst postgraduate students are able to reflect on current practice, and to analyse team working and collaborative

practice in order to improve their own knowledge, skills and competencies. This model is flexible and able to accommodate the varying entry levels of knowledge, skills and competencies on team working and collaborative practice, including clinical practice.

7.3 Expanded Scaffolding Model

The scaffolding approach to learning by Frantz and Rhoda (2017) will be used as an expanded scaffolding model for IPE at UWC (Figure 7.4).

Figure 7.4: Expanded Scaffolding Model (adapted from Frantz & Rhoda, 2017)

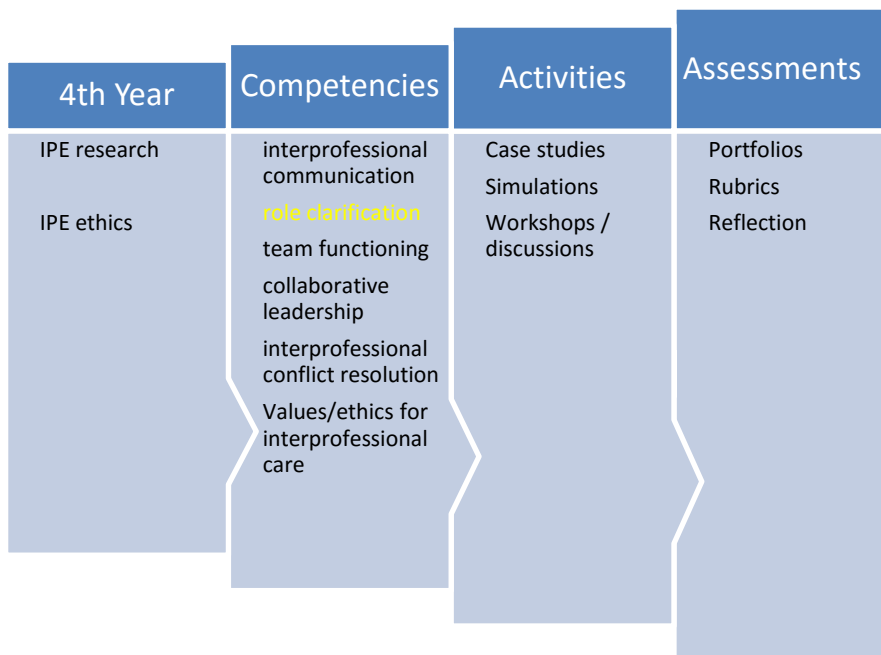


2nd Year	Competencies	Activities	Assessments
IPE theory courses Case studies: World Cafe	<ul style="list-style-type: none"> - Patient / client / family / community-centred care - team functioning - role clarification 	<ul style="list-style-type: none"> Case studies Simulations Workshops / discussions 	<ul style="list-style-type: none"> - Portfolios Rubrics - Reflection



3rd Year	Competencies	Activities	Assessments
IPE Practice	<ul style="list-style-type: none"> Interprofessional communication patient/client/family /community-centred care role clarification team functioning collaborative leadership interprofessional conflict resolution 	<ul style="list-style-type: none"> Case Studies Joint clinical placements Simulations 	<ul style="list-style-type: none"> Portfolios Rubrics Reflection





7.3.1 Guiding principles for integration into curriculum

Stutsky and Spence Laschinger (2014) have formulated a conceptual framework for Interprofessional Collaborative Practice (ICP) through synthesising concepts from 97 research papers and key national and international reports, which will be used to guide the research study. The researchers based their findings on concepts or ideas that logically follow each other and include personal and situational factors that ultimately influence ICP. This in turn results in a number of significant reactions such as improved work behaviours and attitudes, organisational outcomes, and patient outcomes.

7.3.2 Precursors for ICP:

These precursors are divided into personal factors that are controlled internally by an individual, and situational factors to which health professionals are exposed within their place of work, that either discourage or support ICP. In order for ICP to be successful, interprofessional health practitioners must truly believe in the concept and power of ICP (Oandasan & Reeves, 2005; Oliver, Wittenberg-Lyles & Day, 2007). Furthermore, they must have some experience in being able to facilitate the drawing up of an interprofessional care plan when disagreements occur within the team (Bronstein, 2003; McGrail, Morse, Glessner

& Gardner, 2009). By developing an Interprofessional Education (IPE) programme within the Faculty of Community and Health Sciences (FCHS), we are exposing students to adopting the concept and enabling them to participate and to become Interprofessional health practitioners. Through the Interprofessional World Café methodology rendered by the Interprofessional Education Unit (IPEU) within the FCHS, students will gain the practical skills necessary to draw up an interprofessional care plan at the same time, embedding the interprofessional core competencies of interprofessional communication, interprofessional conflict resolution and collaborative leadership (Interprofessional Education Collaborative Panel, 2011; & Canadian Interprofessional Health Collaborative, 2010).

Another antecedent to ICP is that interpersonal skills (McGrail et al., 2009), full cooperation (Gaboury, Lapierre, Boon & Moher, 2011) and communication skills (Atwal & Caldwell, 2002; Havens, Vasey, Gittell & Lin, 2010) must have already been developed by interprofessional practitioners. According to D'Amour, Goulet, Labadie, San Martin-Rodriguez and Pineault (2008), trust is critical and ICP can only be possible when health professionals trust other professionals' competencies. It is essential that individuals become comfortable with themselves first and their own competencies before relying on others' competencies (Clark, 2011). D'Amour et al. claim that professionals will avoid working with others and rather hold onto their own responsibilities for patient care when there are high levels of uncertainty or when trust is low.

Situational precursors that either support or discourage ICP includes leadership (CIHC, 2010; D'Amour et al., 2008; Oandasan & Reeves, 2005), empowerment (Tresolini & Pew-Fetzer Task Force, 1994), and support structures (Clark, 2011; McGail et al., 2009). Both central and local leadership are needed to stimulate collaboration, eradicate barriers (D'Amour et al., 2008), and promote an effective team culture (Clark, 2011). Effective leadership is also important to construct empowering environments for health professionals that include having resources, an opportunity for growth and mobility, support and access to information (Kanter, 1977, 1997). Support structures referred to above include adequate time for sharing knowledge and patient-related material (Atwal & Caldwell, 2002; Clark, 2011; Gaboury, Bujold, Boon & Moher, 2009), and incorporating daily collaborative behaviours into the day-to-day functioning

of professionals (Ottawa Hospital, n.d.). Support can be seen in various ways and includes emotional support, advice or hands-on assistance from supervisors, fellow colleagues or interprofessional practitioners (Kanter, 1977; 1997). Additional support structures comprise formal processes and mechanisms for enabling dialogue (Oliver et al., 2007) such as written policies and/or guidelines and several educational opportunities including in-service training, workshops, presentations and ward rounds.

7.3.3 Curriculum design

7.3.3.1 First year

The first interdisciplinary core course that was developed in the Faculty of Community and Health Sciences is a module called Primary Health Care (PHC). This is a 10-credit, compulsory, first semester module. The module is offered to students across three faculties and includes the disciplines of Dietetics and Nutrition; Physiotherapy, Dentistry, Oral Hygiene, Pharmacy, Occupational Therapy, Social Work, Nursing, Natural Medicine, and Sports Sciences. This is a first semester module which means that students have not had much exposure to the specific discipline for which they have enrolled. The module orientates them to basic concepts of health, development and the philosophy of care. An additional activity that Frantz and Rhoda (2017) propose and that is currently not in the curriculum, is the concept of World Cafes to reinforce curricula concepts. At this level the core competencies of interprofessional communication and team functioning need to be embedded into the IPE curriculum. This is essential since students will have had their first exposure to group work and will need to learn how to communicate with each other across disciplines but also how to report on tasks as a team. While working in groups students will have exposure to the processes involved in group work and will understand the principles and dynamics of teamwork. Activities suggested by the expert panel to develop these competencies include case studies, workshops and group discussion. Assessment practices to determine whether students have acquired the necessary competencies should include group discussions; role plays whereby they can enact scenarios as a team to showcase understanding of concepts; and facilitated/guided structured reflections to instil the notion of in-depth learning.

7.3.3.2 Second year

The second interdisciplinary core course is at a second-year level entitled Interdisciplinary Health Promotion (IHP). This is a 10-credit, compulsory second semester module. The module is offered to students across two faculties and includes the disciplines of Dietetics and Nutrition; Physiotherapy, Dentistry, Oral Hygiene, Occupational Therapy, Social Work and Natural Medicine. This equates to an approximate total number of students of three hundred and fifty participating in the same module, on the same day, at the same time, in mixed disciplines across campus in nine venues, with nine facilitators. This module differs from PHC in that it has a practical component, whereby students visit schools in the surrounding area and have to implement a mini-project based on needs that the schools inform are required. The content of IHP includes health promotion milestones; health promotion in South Africa; health promotion models and interventions; planning framework for health promotion projects; interprofessional education and collaborative practice; service-learning; preparation for health promotion in schools; and health promotion in schools. The core competencies focussed on in this module are patient/client/family/community-centred care team functioning and role clarification. These competencies are essential to develop in students at this level since students will be working with people in a school setting whereby they have to implement a mini-project. Activities to develop these competencies are case studies, simulations, workshops/discussions. The IPE model proposes that students should be assessed through a portfolio which includes deep reflection of their learning experiences throughout this module. Attached to the portfolio is a rubric whereby students can see upfront how they will be assessed as well as in which areas they will be assessed.

The second initiative is a quarterly workshop called an IPE World Café. This World Café builds onto the World Café experienced in first year, but students will now be given a case study or simulated patient whereby they have to do a joint assessment and develop an intervention for the priority needs of the client/patient/family/community. The aim of this experience is to facilitate interprofessional education in a safe/controlled environment by providing students with the opportunity to work in interprofessional teams. Currently this workshop is at third-year level and this study proposes that it be moved to the second-year level since experience has proved that the third-year level is very restricted with discipline-specific curricula. This is

beneficial for the Nursing students in particular since the findings in the readiness for IPE learning reveal that students from this discipline are less ready for IPE. The World Café can also provide an opportunity for first- and second-year students to interact with each other since second-year students have more experience and understand the role a little better within a group setting. This interaction can possibly inspire the first-year students to see the second year students as role models and possibly develop long term relationships through mentorships.

7.3.3.3 Third year

The programme at this level is in its pilot phase entitled clinical and community IPE supervision. The purpose of this course is to explore and promote interprofessional education amongst students from the CHS, Dentistry faculties and Natural Sciences (School of Pharmacy), within clinical and community settings. This course also aims to facilitate the acquisition and application of interprofessional core competencies. At the end of this module students will be able to examine and discuss the IPE core competencies, develop an understanding of the importance of core competencies in collaborative practice, explore its use practically, evaluate students' understanding of IPE and Collaborative Practice concepts through use of theory, questions, discussion and reflection. Specific outcomes are to understand and describe interprofessional education, collaborative practice and core competencies. Also to demonstrate knowledge of the basic concepts of the IPE in health service delivery at the various clinical service sites; demonstrate the ability to identify and draw on the necessary skills to deal with challenges within clinical settings relating to core competencies; and reflect and report on working within an interprofessional team. At the third year level there is an expectation that all six IPE core competencies identified by the Canadian Interprofessional Health Collaborative (2010) should be developed because it is at this stage that students begin clinical practice in various settings. Students should be able to see patients/clients or work on a joint project as an interprofessional team. The integration of core competencies should lead to collaborative practice. Activities at this level should include joint clinical placements, case studies and simulations. The portfolio initiated at the second year level should be added to so that assessors can view the development and integration of core competency development into the third-year level. The reflections within this portfolio should include deeper levels of

learning and the rubric for the assessment should be more extensive to include the integration of the core competencies.

7.3.3.4 Fourth year

The main objectives of the IPE Ethics workshop is to give a brief input on Ethics theory. Students need to apply their ethical knowledge to a chosen case. This gives the IPE Ethics champions an indication of how much ethical input the students already have. Topics covered in the workshop are the theory concerning ethics and steps taken in the clinical reasoning process to be used as a guide. The core competency focus remains the inclusion of the previous six competencies, but in addition it includes values/ethics for interprofessional care (Interprofessional Education Collaborative Expert Panel, 2011). Students are given a case study whereby group discussions take place regarding the ethical dilemma and they have to present their discussions to plenary. In a similar manner, content is covered on research methodologies with senior students, as this module is generic across departments. Activities can include group discussions, workshops and simulations, as well as additional activities listed by the expert panel, such as lectures, e-learning and blended learning. Once content is covered, students proceed to write a research proposal which they can extend at a postgraduate level, if so desired. At this stage, the students' portfolios should include the elements of ethics and research with deeper levels of learning to indicate the impact these elements have on collaborative practice and ultimately improving health outcomes.

Although the postgraduate curriculum is not part of this model yet, in future, students could engage in interprofessional research projects with the outcome of producing a collaborative proposal with each student undertaking an objective of the study for their dissertation.

7.4 Conclusions

Substantive change is occurring in health care, with increased emphasis being placed on the ability of higher education institutions to produce graduates that can work effectively across disciplines and within interprofessional teams. This heralds a new pedagogical requirement for IPE within health professions' education in order to graduate practice-ready clinicians.

Interprofessional pedagogy is commonly unfamiliar to faculty. This study describes the development of an IPE model to guide IPE champions in the design, implementation and evaluation of IPE curricula. Graduating students should have strong disciplinary capabilities, as well as a capacity for patient/client/family/community-centred care; interprofessional communication; role clarification; team functioning; interprofessional conflict resolution; collaborative leadership; and values/ethics for interprofessional care to address the collaborative practice requirements for changing health care delivery.



CHAPTER 8

8 GENERAL DISCUSSION

8.1 Overview Summary of Significant Findings

Chapter Eight summarises the findings from the seven studies presented in this thesis in an attempt to gain a broader understanding of the results obtained in the conceptualisation of an IPE module. The main aim of Chapter Three was to determine how interprofessional interventions are used to develop core competencies amongst undergraduate allied health sciences' students. In Chapter Four, the study describes understanding the students' readiness for interprofessional learning and to compares the findings from first- to senior-level students. A Delphi study is used in Chapter Five to reach consensus on the most appropriate activities to use in an interprofessional curriculum that would assist in instilling interprofessional core competencies in allied health students, together with the applicable evaluation methods. Through a curriculum-mapping exercise, the aim of Chapter Six is to find overlaps between the IPE core competencies and UWC graduate attributes documents to streamline the process of integrating these documents into curriculum design. Findings from the four studies were combined in Chapter Seven to further expand on the Scaffolding Model by Frantz and Rhoda (2017) by including an IPE module in curriculum development. The significance of the expansion of the model was to provide the teaching and assessment strategies that can be used to develop the competencies.

Secondly, the aim of this chapter was to discuss the implications of the research presented in this thesis, in particular to discuss the methodological and practical implications of the findings. Finally, it was important to acknowledge any shortcomings of the research when interpreting the results and to suggest ways in which to expand or improve this research study. Therefore, the third aim of this chapter was to discuss the limitations and future recommendations emanating from the studies.

8.2 Summary of Significant Findings

There are a number of significant findings presented in this thesis that make an important contribution to our understanding of the development of core competencies in curriculum design. In particular, the study was designed to expand our knowledge of this area in IPE by investigating six main aims. Each aim and the findings relevant to the aims as related to each study, are discussed separately below.

Aim 1: To assess the current intervention strategies used to evaluate Interprofessional Core Competencies in students.

The systematic review revealed that there are no South African studies currently in the literature that provide evidence of IPE core competency development in curriculum design. In addition, the limited number of research studies found reporting on curricula did not cover all the core competencies and were not linked to a specific model. The research presented in this thesis is unique as it is the only attempt in South Africa to design an IPE model based on the reports of fellow researchers in this area (Waggie & Laattoe, 2014; Frantz & Rhoda, 2017). Furthermore, it is the only study found in the literature that attempts to identify the overlap between core competencies and graduate attributes as similar studies mention only one or the other. Other findings in this study related to the above aim were that similar studies found in the literature did not highlight the core competency set that their institution decided to adopt and, as a result, there was a lack of understanding of the reference point from which they were working. No consistent assessment methods were found in the data set which further provided a rationale for this research study to develop an overall framework for IPE core competency development.

Aim 2: To determine and compare the readiness of first- and senior-level students for interprofessional learning.

The Readiness for Interprofessional Learning Survey (RIPLS) has been used widely in the literature and many studies report on attitudes and perceptions of students towards IPE. These attitudes vary from not wanting to engage with others across disciplines, to differences in the baseline readiness of students. 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 other students' professions, the successful implementation for such programmes is dependent on the key stakeholders, namely the students, being ready to engage. Findings in this research reveal that readiness increases along the continuum of learning at UWC and that the curriculum must be scaffolded to further develop competencies. It was generally found that females tend to be more ready to learn interprofessionally, students in the nursing discipline are less ready and senior students are more ready to learn interprofessionally, as compared to first year students.

Aim 3: To describe activities and evaluation strategies that can be used to develop core competencies through a Delphi study.

The expert panel in the Delphi study highlighted a range of activities and assessment methods to develop IPE core competencies and consensus was reached during round two of the exercise. The preferred activities that are common across all the core competencies are case studies, joint clinical placements, simulations, role plays and workshops/discussions. The preferred assessments for each of the above activities that related to each of the core competencies are portfolios, reflection and the use of rubrics. The learning outcomes need to be clearly outlined in IPE curriculum design that should incorporate the different activities and assessment methods identified by the expert panel along the continuum of learning.

Aim 4: To identify the occurrence of IPE core competencies in curricula and to understand the similarities of IPE core competencies and graduate attributes.

In order to produce graduates that can work collaboratively to address the complex problems inherent in society, it has become imperative to design curricula accordingly. The integration of graduate attributes and/or IPE core competencies of these future health professionals, has become a priority on higher education institutions' teaching and learning agendas. The infusion of these competencies/attributes has become a double-edged sword for staff to incorporate in curricula. In an attempt to streamline this process, this study attempted to discover overlaps between competencies and attributes through a curriculum-mapping exercise. Findings reveal that there are similarities, but much-needed further discussions are also required to discuss the items where no similarities are found. The documents used in the study have been recently updated and this creates a need for further faculty engagement.

Aim 5: To design an IPE model that incorporates the core competencies of IPCC as an outcome for the University of the Western Cape and Aim 6: To position the current IPE programme within a proposed model.

The two aims were combined in a final study to develop an IPE model for the integration of core competencies in IPE curriculum design. This model stems from the work of fellow researchers at UWC and was expanded upon by the researcher in this study (Waggie & Laattoe, 2014; Frantz & Rhoda, 2017). Embedding competencies along the continuum of learning with appropriate activities and assessment methods is a step in the right direction to produce T-shaped graduates that are able to work collaboratively to solve complex problems. In addition, they should become lifelong learners, have positive relationships and interactions with their local and global communities, and be critical towards knowledge of and the understanding of health outcomes in society.

8.3 Implications of the Research

For core competencies to be successfully integrated into curricula, a large-scale curriculum-mapping exercise should be conducted within each department of the faculty to determine what competencies are currently included in the curricula and what competencies still need to be included, together with the relevant year level of each. This implies that training sessions should be conducted with staff in order to perform such an exercise with clear deadlines in place to gain an understanding of the faculty as a whole.

Together with the Teaching and Learning Specialist, on-going staff development workshops should take place to gain comprehensive understanding of activity uses, assessment strategies and curriculum design with staff from each department. It is taken for granted that academics are expected to be skilled in this area but, in actual fact, they come from various backgrounds with a vast understanding of curriculum design.

With the acceptance of this model, a longitudinal study could be embarked upon to track competency development along the continuum of learning. Research instruments should clearly be identified for each year-level and data collected should be analysed to inform the

following year-level of any possible gaps that occurred due to irregularities in the programme. At the conclusion of the undergraduate curriculum, graduates' professional development should be observed to determine the impact that this IPE model had on them as health professionals in terms of collaborative practice.

E-learning environments should be explored as an emerging field in higher education. The possibility of virtual teaching spaces is becoming more and more a reality that can unite students across the world. The implications are that students will also need exposure in this domain to form virtual IPE working relationships and might require other competencies that have not previously been contemplated. E-portfolios are recently being introduced to both staff and students as alternatives to the traditional hard copy format. This will require a number of training sessions which will place additional strain on existing curricula that are already burdened with discipline-specific content and practical work.

The findings from the current thesis have many implications that are discussed separately under the headings of methodological and practical implications.

8.4 Limitations

Overall limitations of this study are presented first, followed by the limitations of each of the contributing studies. An important limitation of this thesis is that it presents only the design of the IPE model and not the implementation and evaluation aspects of the study. As a result, the design principles that are presented in the study represent only a first full draft of a model for integrating generic competencies into curricula. The study was carried out over a period of three years and, in that time, there were a changes in the staff complement within the respective departments which impacted on the study, as people have different levels of knowledge and experience that they bring with them and impart to students. In addition to this, policy changes also impact on the study in terms of the new Institutional Operational Plan (IOP, 2016-2020) and the revised Graduate Attribute document.

This study represents a first step in both changing and guiding curriculum development in the teaching and learning of interprofessional education and collaborative practice. The research

will open a platform for further discussion and engagement to drive curriculum changes in the faculty. Though it is clear that this is a first step in a larger process, the findings in a South African context, although positive, are essentially untested and should be recognised as such. Further research is required into curriculum design that develops IPE core competencies which will strengthen and support the findings of this study.

Having identified and discussed the limitations of the larger study, the following limitations for each of the contributing studies are outlined:

Limitations of the systematic review: Chapter Three. IPE is an emerging field in health professions' education and, while every attempt was made to include as much evidence as possible, only a limited number of articles was found. No articles were found that related to the South African context. All the studies that are included in the data set reported on the core competencies and the associated activities used and did not measure the impact of these initiatives over a period of time. Such findings could have contributed largely to the overall design of the IPE model in this research study.

Limitations of the readiness survey: Chapter Four. Most of the participants in the study were female, which could represent a gender bias, although this was a global finding in all the literature consulted. Repetition of the survey with second- and third-year students could further assist in determining how readiness improved in these periods along the continuum of learning to identify further gaps in the current curricula. A further study should be done with staff to determine their readiness to engage with IPE as this would also assist in the design of the curriculum in order to include possible staff development initiatives.

Limitations of the Delphi study: Chapter Five. Although the number of participants fell into the normal range for Delphi studies, a larger number would have yielded a more enriched data set. The first round of the Delphi study took almost a year to complete as the researcher had to send out monthly reminders to participants who had consented to participate in the study.

Limitations of the curriculum-mapping exercise: Chapter Six. This was an initial exercise to determine the overlaps between core competencies and graduate attributes but no further

mapping exercises were reported on in embedding those generic competencies in the curriculum of a specific department. This would have contributed significantly to the data set of this study.

Limitations in the development of an IPE model: Chapter Seven. The only limitation in this phase of the study is that the IPE model is in the design phase and the opportunity has not arisen for it to be implemented and evaluated in order to refine the model.

8.5 Recommendations

Since IPE is established at UWC and there are a number of ongoing initiatives in this emerging field, the only major recommendation is to address the barriers to full participation encountered by all departments in the FCHS. Bridges et al. (2011) state that there are many barriers to developing successful interprofessional learning opportunities which can be overcome with persistence and commitment. Each curriculum effort should be critically evaluated, both quantitatively and qualitatively. The following resources identified by Bridges et al. (2011) should be considered critical in the success of the interprofessional learning experiences.

- i) Administrative support. IPE learning opportunities in many instances will require substantial changes in the curriculum structure. Senior management must be supportive of these initiatives.
- ii) IPE programme infrastructure. Faculty resources are essential and should be clearly identified. Staff members from each department are required to provide leadership and coordinate activities between their respective departments. In addition, administrative support is required to schedule teaching spaces, submit attendances and grades, and find substitutes when necessary.
- iii) Committed, experienced faculty. Dedicated and experienced staff are required to facilitate student groups in a didactic or a clinical context.
- iv) All student efforts should be acknowledged through awards, certificates, or grades.

Finally, it is clear that design research is an appropriate method in curriculum design for interprofessional education and practice. The approach describes a rigorous method for

designing and facilitating processes in research studies that aim to go further than simple descriptive research. IPE champions and researchers who are investigating the impact of new IPE initiatives, including healthcare and education, are encouraged to consider design research as a useful method for designing their projects.

The section above presents the overall recommendations of the study. The section below presents the recommendations of each chapter separately.

Recommendations following the systematic review in Chapter Three. The limited number of studies that were found suggest that there is a gap in the field for high-quality research that incorporates IPE core competencies in health sciences curricula. The results of this systematic review indicate that further research in this area is necessary to confirm that embedding interprofessional core competencies and graduate attributes into curricula will produce better equipped health professional to deal with the complex needs of society. Not only is additional research required, but longitudinal studies must provide evidence of the impact that these future health professionals will have on improved health outcomes of communities. Researchers should base their studies on IPE models that are geared towards transformation in teaching and learning, rather than simply being more efficient. Studies should begin with the competencies that are necessary as part of a curriculum to bring about these changes, and then measure the impact of the curriculum changes.

Recommendations following the survey in Chapter Four. After implementation of the new IPE model, it is recommended that a follow-up readiness survey be carried out and the results compared with this study to determine whether or not students feel more ready, after changes to the curriculum have been made. Further studies could be done with staff/clinicians/clinical supervisors to determine their readiness to engage with IPE.

Recommendations following the Delphi study in Chapter Five. IPE is an emerging field and the literature is constantly growing with more and more experienced academics and practitioners emerging. It would be worthwhile to do a follow-up survey to get feedback on the IPE model that emerges from this research study.

Recommendations following the curriculum-mapping in Chapter Six. Since curriculum-mapping was used in this study to determine the overlap with graduate attributes and IPE competencies, it is recommended that curriculum-mapping be done with each department in the FCHS. This exercise should reveal if IPE is embedded in the curriculum, as well as which competencies and attributes are used at each year level and how they link with each other.

Recommendations following the development of the IPE model in Chapter Seven. Since the IPE model is a new initiative in the FCHS and will provide a framework for all the existing and new IPE initiatives, it is recommended that the researcher presents the findings of the study to faculty and creates opportunities within the faculty and departments for staff development opportunities. Further research is also recommended to determine the effectiveness of the IPE model.

8.6 Conclusion

This chapter described the final outcomes of this study, beginning with the major contributions made by each phase of the research study to the development of the design of the IPE model. The activities and assessment strategies identified by an expert panel provided guidance for curriculum design in transforming health professions' education for students at UWC. While the model is not new, it has expanded existing theoretical frameworks to provide a structure for new and existing activities in the FCHS. In addition to the development of the IPE model, the research study makes a contribution to the body of knowledge that has emerged from the various studies presented in this thesis. Finally, the future recommendations of the thesis are described for each phase.

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Appendices

The following appendices were relevant to this research study and are listed below:

- A. Methodology and ethics approval of research project
- B. Information letter of research study
- C. Focus group confidentiality binding form
- D. Consent form for individual participants
- E. Change of thesis title
- F. Letter from editor
- G. Readiness for Interprofessional Learning questionnaire
- H. Data extraction tool for Systematic Review
- I. Re-aim framework evaluation



Appendix A



UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN DEPARTMENT OF RESEARCH DEVELOPMENT

4 November 2014

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape approved the methodology and ethics of the following research project by:
Mr GC Filies (Social Work)

Research Project: Designing, implementing and evaluating an interprofessional education program that aims to instill the core competencies of interprofessional collaborative practice in allied health students.

Registration no: 14/9/25

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

A handwritten signature in black ink, appearing to read 'P. Josias'.

*Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape*

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A place of quality,
a place to grow, from hope
to action through knowledge

Appendix B



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2617, Fax: 27 21-959 2606

E-mail: gfilies@uwc.ac.za

Project Title: Designing, implementing and evaluating an interprofessional education program that aims to instil the core competencies of interprofessional collaborative practice in allied health students

What is this study about?

This is a research project being conducted by **Gérard Charl Filies** at the University of the Western Cape. We are inviting you to participate in this research project because you are considered as a senior student in the Faculty of Community and Health Sciences or as a staff member part of the interprofessional task team or as an expert in Interprofessional Education that will either directly participate in our programme or assist to develop the programme for the study. The purpose of this research project is to design, implement and evaluate an interprofessional education programme that aims to instil the core competencies of interprofessional collaborative practice in allied health students at the University of the Western Cape. This study has the following objectives in order to achieve the aim of the research study: a) To assess the current intervention strategies used to evaluate the core competencies of Interprofessional Core Competencies in students; b) To design an IPE program that incorporates the core competencies of IPCC as an outcome; c) To implement the designed IPE program and; d) To evaluate the impact of the IPE program on the participants.

What will I be asked to do if I agree to participate?

You will be asked to complete a questionnaire at the start and end of the interprofessional programme. The first questionnaire will ask you questions about: Your readiness to participate in an interprofessional programme. The second questionnaire will evaluate your experience working/participating in an interprofessional team. These questionnaires will be completed in an environment which is suitable and comfortable for you and will not take longer than 20 minutes to complete. Staff members as part of a task team will be asked to participate in a focus group discussion to assist in developing an interprofessional programme. An expert panel will also be asked to participate in a Delphi study to provide essential input in finalizing the interprofessional programme.

Would my participation in this study be kept confidential?

The researcher undertakes to protect your identity and the nature of your contribution. To help protect your confidentiality, the information you provide will be totally private; no names will be used so there is no way that you can be identified as a participant in this study. The information will be treated with anonymity and confidentiality. Your name will not be reflected on the questionnaires or on any other document. The information obtained from the focus group discussions and Delphi study will be will also be kept confidential and participants will be given a letter of the alphabet by which to identify them by the researcher but there will be no way for anyone else to link the letters back to the participants. All documents will be locked up in a filing cabinet in the Interdisciplinary Teaching and Learning Unit at the University of the Western Cape and only the researcher will have keys to the cabinet. All electronic data will be on the researcher's laptop which will be password-protected.

If we write a report or article about this research project, your identity will be protected. This study will use focus groups and the extent to which your identity will remain confidential is dependent on participants' in the Focus Group maintaining confidentiality.

What are the risks of this research?

All human interactions and talking about self or others carry some amount of risks. We will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator learn more about Interprofessional Education and Collaborative Practice. We hope that, in the future, other people might benefit from this study through improved understanding of Interprofessional Education and Collaborative Practice.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by *Gérard Charl Filies based in the Interdisciplinary Teaching and Learning Unit* at the University of the Western Cape. If you have any questions about the research study itself, please contact me at: University of the Western Cape, Robert Sobukwe Road, Bellville or telephone (021) 959 2617 or by email on gfilies@gmail.com.

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Head of Department: Prof. N. Roman (nroman@uwc.ac.za)

Dean of the Faculty of Community and Health Sciences: Prof. J. Frantz (chs-deansoffice@uwc.ac.za)

University of the Western Cape

Private Bag X17

Bellville 7535

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.



UNIVERSITY *of the*
WESTERN CAPE

Appendix C



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FOCUS GROUP CONFIDENTIALITY BINDING FORM

Title of Research Project: Designing, implementing and evaluating an interprofessional education program that aims to instil the core competencies of interprofessional collaborative practice in allied health students.

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits. I understand that confidentiality is dependent on participants' in the Focus Group maintaining confidentiality. I hereby agree to the following:

I agree to uphold the confidentiality of the discussions in the focus group by not disclosing the identity of other participants or any aspects of their contributions to members outside of the group. Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Participant's name.....

Participant's signature.....

Date.....

Appendix D



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CONSENT FORM

Title of Research Project: Designing, implementing and evaluating an interprofessional education program that aims to instil the core competencies of interprofessional collaborative practice in allied health students.

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

Participant's name.....

Participant's signature.....

Date.....

Appendix E



University of the Western Cape

Faculty of Community and Health Sciences

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HIGHER DEGREES COMMITTEE

CHANGE OF THESIS TITLE

Candidate	<u>SURNAME</u> Filies							<u>FIRST NAMES</u> Gérard Charl			
Student No	9	2	3	9	8	7	2	Degree	PhD	Department	Child & Family Studies
Is the student a staff member (this includes full-time, part-time, academic and non-academic staff members)?										<u>Yes</u> <input checked="" type="checkbox"/>	<u>No</u> <input type="checkbox"/>
Current Thesis Title	Designing, Implementing and Evaluating an Interprofessional Education Program that Aims to Instil the Core Competencies of Interprofessional Collaborative Practice in Allied Health Students										
New Thesis Title	Please use sentence case and full words explaining abbreviations										
Development of an Interprofessional Education Model that Aims to Instil the Core Competencies of Interprofessional Collaborative Practice in Allied Health Students Curriculum											
Supervisor	Prof J. Frantz										

Supervisor: Date: 05 October 2017

Appendix F

ISOBEL BLAKE

B.A. (UNISA)
English, Psychology

17 Second Avenue
Harfield Village
Claremont
Cape Town

Telephones: Home (021)674-0538
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12 December 2017

TO WHOM IT MAY CONCERN

This is to state that I, Isobel Blake, edited independently and professionally a Master's degree thesis entitled "Development of interprofessional education model that aims to instil the core competencies of interprofessional collaborative practice in allied health students' curriculum" My brief was to check the article for grammar, syntax, spelling and overall correct English of a high standard for submission to a university. At no time did I make any changes to the context or format of the article, which is still true to its original state.

ISOBEL BLAKE

B.A. (UNISA) English, Psychology

Appendix G

Readiness for Interprofessional Learning Scale (RIPLS) Questionnaire

The purpose of this questionnaire is to examine the attitude of health and social care students and professionals towards interprofessional learning.

Your name: (develop your own 'personal code' by using the following formula):

First 3 letters from your first name: Last 3 letters from your last name:

Year of birth: 19 Your discipline: _____ Gender: M F

Have you completed the RIPLS questionnaire before? Yes No

If you answered yes to the previous question please indicate how long ago you last completed the questionnaire:

1 – 3 months 3 – 6 months 6 – 12 months

1 – 2 years 2-3 years 3+ years

Have you had previous experience of interprofessional teaching? Yes No

If you answered yes to the previous question please give a very brief statement of what this IPE teaching was and any impact it may have had.

Please complete the following questionnaire.

		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	Learning with other students / professionals will make me a more effective member of a health and social care team					
2.	Patients would ultimately benefit if health and social care students / professionals worked together					
3.	Shared learning with other health and social care students / professionals will increase my ability to understand clinical problems					
4.	Communications skills should be learned with other health and social care students / professionals					
5.	Team-working skills are vital for all health and social care students / professionals to learn					
6.	Shared learning will help me to understand my own professional limitations					
7.	Learning between health and social care students before qualification and for professionals after qualification would improve working relationships after qualification / collaborative practice.					

		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
8.	Shared learning will help me think positively about other health and social care professionals					
9.	For small-group learning to work, students / professionals need to respect and trust each other					
10.	I don't want to waste time learning with other health and social care students / professionals					
11.	It is not necessary for undergraduate / postgraduate health and social care students / professionals to learn together					
12.	Clinical problem solving can only be learnt effectively with students / professionals from my own school / organisation					
13.	Shared learning with other health and social care professionals will help me to communicate better with patients and other professionals					
14.	I would welcome the opportunity to work on small group projects with other health and social care students / professionals					
15.	I would welcome the opportunity to share some generic lectures, tutorials or workshops with other health and social care students / professionals					
16.	Shared learning and practice will help me clarify the nature of patients' or clients' problems					
17.	Shared learning before and after qualification will help me become a better team worker					
18.	I am not sure what my professional role will be / is					
19.	I have to acquire much more knowledge and skill than other students / professionals in my own faculty / organisation					

If you have any further comments regarding interprofessional education please enter them in the box below

Thank you for completing this survey. The data will provide us with an understanding of the influence of the Interprofessional Collaborative Practice program that we are facilitating or implementing. The original RIPLS survey has been adapted for use by Latrobe Community Health Service & the Health & Socialcare Interprofessional Network (HSIN), Victoria – August 2009.

Appendix I

RE-AIM Framework evaluation (Adapted from Glasgow et al., 2001 and Blackman et al. 2013)

RE-AIM Dimensions	Questions	Scoring
REACH	1. Does the article indicate who the program is intended for (Inclusion and exclusion criteria) 2. Does the article report on the representativeness of the target population? 3. Does the article report on participation rate?	Y= 1 / N=0 Y=1 / N=0 Y=1 / N=0
Effectiveness	4. Did the program achieve the intended objectives? 5. Do they report on the limitations of the intervention? 6. Reports on at least one outcome of the intervention 7. Reports on attrition	Y=1 / N=0 Y=1 / N=0 Y=1 / N=0 Y=1 / N=0
Adoption	8. Is the setting clearly described? 9. Does the evaluation report on the adoption of the intervention by the participants or the organization? 10. Reports on who delivered the program	Y=1 / N=0 Y=1 / N=0 Y=1 / N=0
Implementation	11. Describes the duration and frequency of the intervention 12. Has the staff / participants of the organization/intervention been involved in delivering the program (cost implications) 13. Reports on intended and delivered interventions	Y = 1 / N=0 Y = 1 / N=0 Y=1 / N=0
Maintenance	14. Does the article report on long term effects of the intervention (after 6 months) 15. DO they report on the indicators used for intervention follow-up?	Y=1 / N=0 Y=1 / N=0