A study of Interprofessional Education and Working in Healthcare

A longitudinal study of attitudes towards interprofessional education and working among healthcare undergraduate students

A thesis submitted to the University of Dublin, Trinity College,
for the Degree of Doctor of Philosophy

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May 2018

Trinity College Dublin

Declaration

I, Margaret Mc Adam, declare that this thesis is entirely my own work and has not been submitted as an exercise for a degree at this or any other university.

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Thesis summary

Background

The genesis of this study evolved in response to the global recognition that effective interprofessional working (IPW) between healthcare professionals is vital for safer, quality patient/client care and primary healthcare delivery within the healthcare service, and to the subsequent call for development and implementation of interprofessional education (IPE) in healthcare courses in Higher Education Institutions around the world. Traditionally, healthcare students complete their professional courses in a uni-professional context, which no longer presents a viable solution to enable healthcare graduates to work interprofessionally. However, worldwide literature reports that successful outcomes for IPE and effective IPW are associated with attitudes relating to value attributed to IPW, strength of professional identity, professional stereotyping, and readiness for interprofessional learning. This study aimed to investigate these important influences to inform the development of IPE interventions.

Methods

A longitudinal cohort survey which took place in a Faculty of Health Sciences in one of the largest Higher Education Institutions (HEI) in the Republic of Ireland. This institution provides courses for all frontline professions in healthcare. The sample included first year undergraduate dietetic, medical, nursing, occupational therapy, pharmacy and physiotherapy students. Data was collected on course commencement and 12 months later. A non-healthcare group served as a comparator.

Results

The value placed on IPW and readiness for interprofessional learning was high at both timepoints. Students also presented with strong professional identity that was sustained into the following year. A highly statistically significant increase was observed at T2 for the healthcare group ($p < 0.001$) that was not observed in the comparator group on value attributed to IPW. Differences between healthcare groups on value and importance of IPW, strength of professional identity and readiness for interprofessional learning emerged at both timepoints. Students entered courses with pre-conceived stereotyped views with moderation across timepoints in some groups. Positive correlations were found between heterostereotypes/autostereotypes and readiness for IPE at baseline. Gender differences emerged with females indicating sustained higher readiness for IPE and higher value on IPW. Gender, strength of professional identity, and value attributed to interprofessional team working, were statistically significant to predict readiness for interprofessional learning ($p < 0.001$).

Conclusion

These study results have implications for the timing, structure, design and theoretical underpinnings of IPE in undergraduate healthcare education in both clinical and academic settings, and have made a unique contribution to the body of global evidence involving an Irish population of undergraduate healthcare students. IPE holds a key to improving IPW and effectively executed, has potential to positively impact on the safety and quality of patient/client care within our Irish healthcare service.

Acknowledgements

I wish to acknowledge and thank all the people who helped me throughout this research process and on my PhD journey.

Firstly, my special thanks to the 2011 undergraduate student cohort from the healthcare professions of dietetics, medicine, nursing, occupational therapy, physiotherapy and pharmacy. Also to the 2011 undergraduate student cohort from Social Studies, who played a significant part in this research as the non-healthcare comparator group.

Professor Catherine Mc Cabe.

Catherine, as my main supervisor, I cannot thank you enough for your wisdom, inspiration and encouragement, and for your endless enthusiasm throughout this lengthy process.

Dr. Margaret Mc Cann.

Thank you Margaret for your interest in co-supervising this research. You provided invaluable information, guidance, encouragement and support.

Professor Alison While, I thank for her excellent ideas, support and unique ability to motivate my work at the start of this PhD.

Professor Maria Brenner, I thank most sincerely for her on-going support and particularly for her help prior to the Viva Voce examination.

To Frances Ryan, my colleague and friend at Trinity College, who always helped me to laugh along the way despite the formidable, albeit magnificent challenges of PhD studentship.

I thank my colleagues from the Faculty of Health Science, Schools of Nursing and Midwifery; Pharmacy and Pharmaceutical Sciences; and Medicine, incorporating Occupational Therapy, Physiotherapy and Human Nutrition and Dietetics, who helped and supported this study. It was a pleasure to collaborate interprofessionally with you all.

I would like to pay a special tribute to Professor Scott Reeves who through his writings and presentations was an inspiration and motivating force throughout my research.

Scott sadly and unexpectedly passed away this month, ~RIP~.

To my parents Mary and James McAdam ~RIP~

Thank you for your love and support throughout my career. Without your positivity and encouragement these achievements would not be possible.

To all my family members and friends who helped and supported me along the way in ways that they possibly never realised.

Finally, suffice to say the challenges that came with PhD studentship have led me to believe that it takes a family to complete a PhD…

I thank my husband Shay and our wonderful children, Danielle and Jonathan,

for your relentless understanding, encouragement and love,

…you all make everything in life so worthwhile…

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Chapter 1 Introduction to study

1.1 Introduction

This thesis presents the research I conducted for my PhD study. An overview of the study context, researcher background and an introduction to the concepts of interprofessional education and working that underpin this research inquiry are first presented in this chapter. This is followed by an overview of the chapters in the thesis including the literature review, study aims, methodology, method, findings, discussion and the implications and recommendations of the study findings for education, health policy and future research. Lastly, this chapter captures the first of a series of reflective and reflexive writings which endeavour to strengthen the integrity of the research.

1.2 Overview of study background and context

Before providing an overview of the chapters in my thesis, I wish to provide some context for the study. Effective interprofessional working (IPW), or what was traditionally termed 'multidisciplinary teamwork', relates to the execution of effective collaborative skills and abilities between the different healthcare professionals. IPW is deemed to be critical for the successful delivery of safe, quality patient/client care and primary healthcare delivery (WHO 2013a and b). It therefore seems paradoxical and somewhat counterintuitive that undergraduate students of healthcare frequently learn the theory and skills related to their professions on educational programmes that are completely separate for both clinical and academic content. In other words a 'uni-professional' learning context predominantly dictates the healthcare profession

curricula. Interprofessional education (IPE) aims to address this problem whereby students learn 'with, from and about each other' (CAIPE 1997:19) so they can learn about the different professional roles and practice collaboratively after they graduate. A uni-professional approach to healthcare education still prevails to a large extent in the Republic of Ireland today, albeit there are sporadic IPE endeavours taking place in Higher Education Institutions (HEI) around the country.

So where do I fit into this story? I commenced my teaching career firstly in a hospital-based school of nursing and then at an education centre in Dublin. This was an exciting time for nurse education as it was undergoing a complete metamorphosis culminating in a transfer from the traditional hospital based apprentice type model, to the third level sector. As a 'product' of this model, I was enthused by this move and saw it as a positive and major advancement for the profession; one that I also believed could secure parity of status for nursing with other university based healthcare professions. I became an active member of our curriculum development committee; tasked with developing a new undergraduate degree programme in partnership with two other Dublin based hospitals and Trinity College Dublin. I enjoyed this work immensely and as my enthusiasm for education and curriculum development continued to grow, I completed a Master Degree in Adult and Community Education in 2002 and later that year commenced my academic career in Trinity College.

Although I did not become familiar with the phrase 'interprofessional education' until about 2008, the idea of shared learning between different healthcare disciplines was always of interest to me. This interest progressed over the years, cultivated mainly through teaching core subjects such as, communication/collaborative skills, research, and education theory. These essential topics apply to all healthcare professionals from

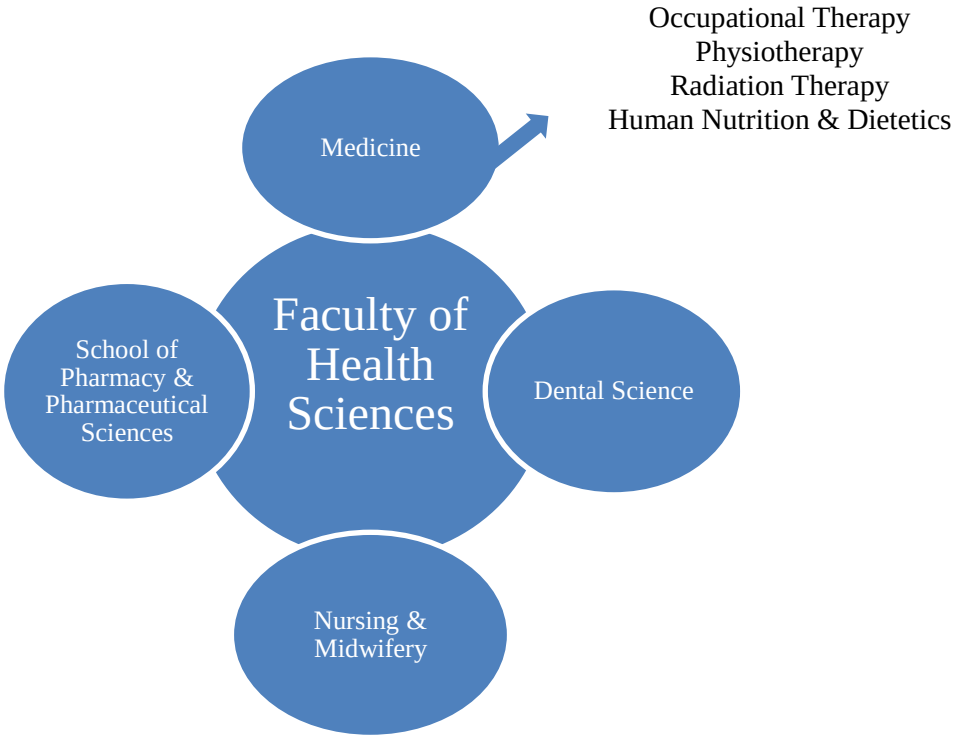
the beginning of their courses. With just one discipline attending lectures and small group tutorials, learner and teacher were divorced from the opportunity to glean another healthcare students' perspective. Our healthcare students for the most part remained isolated from each other with the promise of interaction solely the remit of clinical practice placements. But these too had limitations. As one could expect in 'real world' healthcare placements the experiences of collaborative learning varied widely. Some students reported informal IPE 'type' experiences; others felt they merely stood alongside other professionals with little or no interaction.

I suppose when nurse training moved to the university sector, I believed this would translate into greater collaboration between the different healthcare professions. On the contrary I was struck by the lack of, and in some instances total absence of collaborative acts between our schools within the Faculty. In truth I found this 'siloed' existence disappointing and I felt there must be a better way to educate our students. I debated the idea of shared learning with a number of academic colleagues at the time and whilst we felt teaching healthcare students together intuitively made sense, in reality it seemed logistically impossible given our current Faculty structure, conflicting timetables and not least the pervasive professional cultures akin to individual healthcare professions. And therein lays potentially one of the greatest challenges to the execution of shared learning methods. Although we were all under the same metaphorical 'roof', dedicated to common goals, in reality a uni-professional culture prevailed in our Faculty with different healthcare professionals working within their own separate territories and embracing somewhat different ideologies.

At this point in my thesis it may be useful to review the Faculty of Health Science structure to illustrate the organisational dynamics and structural issues that can form

barriers to effective implementation of IPE within our course curricula. Our Faculty comprises four independent schools; School of Nursing and Midwifery, School of Pharmacy and Pharmaceutical Sciences, School of Dental Science, and School of Medicine. Occupational Therapy, Physiotherapy, Radiation Therapy, and Human Nutrition and Dietetics are nested within the School of Medicine (Figure 1.1).

Figure 1.1 Faculty of Health Sciences structure



While navigating the literature I discovered that the IPE movement had been gaining momentum for the past three to four decades. The World Health Organisation had been proactively supporting IPE, encouraging stakeholders within the education and healthcare sectors to recognise IPE as a potential solution to collaborative failure (WHO 1978; 1988). On a practical level it could be argued that uni-professional approaches to

healthcare education are a waste of resources, but more seriously they may ultimately impact upon teamwork and quality care. Many complex conditions require a collaborative endeavour and the success (or the failure) of teamwork can make a critical difference to patient/client healthcare care outcomes. Before this study commenced planned shared learning between our healthcare students was virtually none existent. The assumption had always been that graduates would 'naturally' find the ability to collaborate effectively.

Discovering from the literature that IPE implementation could in reality find a place in our curricula marked a turning point for me, fuelling my interest strongly enough to pursue this topic to PhD level. Since commencement of this study an interprofessional philosophy has grown and prevails within our Faculty. We have established an interprofessional learning (IPL) group with representation from all schools. IPE workshops involving students from varying healthcare professions continue to be developed, and an IPL simulation suite has been established this year. However, the matter of how best to execute IPE and navigate the structural and attitudinal barriers to its successful implementation, remain current issues that require further inquiry.

1.3 Overview of thesis chapters

Chapter 2: Background to study

Chapter two builds on this introductory chapter. It provides detail on the background to the global interprofessional movement and argues the need for 'interprofessionalism' as the approach to attain safe quality patient/client care in modern healthcare systems. This chapter also presents relevant national and international policies and highlights the constraints and challenges to the implementation/consolidation of IPE initiatives in the Irish education sector.

Chapter 3: Literature review

Chapter Three presents the literature that underpinned this study and informed the development of the study aims and objectives. Three key themes emerged from the literature providing framework and structure for the literature review. Hence the chapter is primarily divided into three sections each reflecting a theme, these are: 1. the significance of professional identity for IPE, 2. stereotyping among the healthcare professions, and 3. readiness for students of healthcare to learn interprofessionally. The concept of the value and importance of IPW for safe, quality patient/client care underpins these discussions. The influence of learner characteristics and socio-environmental experiences relating to IPE, and the relationships between strength of professional identity, stereotyping, learner characteristics and readiness for interprofessional learning are also explored. This chapter concludes with a summary of the main arguments fundamental to this inquiry and that have shaped the global IPE agenda over the last three decades. The study aims, objectives and reflective thoughts on the literature review process comprise the last sections of this chapter.

Chapters 4 and 5: Theoretical and methodological perspectives and methods

The fundamental aim of this study is to investigate the attitudes of undergraduate healthcare students in an Irish university towards IPE and IPW at course commencement and at the beginning of the second year, in order to inform the development and implementation of IPE interventions. Chapter four illuminates the worldview of the researcher that formed the basis for the choice of research methods to address this aim. The research is theoretically underpinned by two social psychology theories; the Contact Hypothesis (Allport 1954) and Social Identity Theory (Taifel 1971), and this chapter explains how these theories can provide an effective lens through which the potential role of IPE for collaborative working can be viewed and better understood.

Chapter five commences with a review of the study objectives, visually mapping these to the survey scales, variables measured and statistical procedures. It details the ethical considerations that were taken into account in line with international ethical standards. Following that, the step-by-step processes that were undertaken for the operationalisation of the study are specified. An explanation of, and the rationale for the decisions and procedures that took place before, during and after data collection relating to research site and access, population, sample and sample size, inclusion and exclusion criteria, research instrument, pilot study, data collection procedure and data management is presented. The mechanisms to ensure validity and reliability are explained. This chapter provides justification for choosing the data analysis methods using the Statistical Package for Social Sciences (SPSS Statistics for windows, Armonk, NY: IBM Corp,) Version 22.0, and an explanation about testing assumptions. The

chapter concludes with some reflective thoughts on the process of deciding the methods for this study.

Chapters 6 and 7: Findings and discussion

Chapters six and seven detail the study findings and provide an interpretation for their significance in the light of what was already known about the research problem. The findings are contextualised with contemporary literature, and in the light of theoretical perspectives relevant to this research. Where relevant, the quantitative data is supported by written comments offered by the student participants. New understandings or insights that may have significance for the design and implementation of effective interprofessional education in this institution and potentially other HEI's in the Republic of Ireland are elucidated. The limitations of the study are presented and contextualised. Reflective perspectives feature at the beginning and end of chapter 7. The chapter concludes with strategies to disseminate the study findings.

Chapter 8: Conclusion and recommendations

Chapter eight concludes this study with the key messages derived from the findings. It details the study implications and recommendations for relevant stakeholders involved in clinical/academic healthcare education, decision and policy making, and for future research. The usefulness of the theoretical framework to support the design and implementation of IPE is referred to as relevant throughout the chapter. This chapter closes the thesis with a reflective reaffirmation of the impact and significance of the study findings.

1.4 Reflexivity

Before concluding this introductory chapter, I wish to clarify the significance of adopting a reflexive researcher stance during the process of conducting my research. Reflexivity refers to a process of reflectiveness concerning the implications of the knowledge obtained about the world from the research methods and decisions taken by the researcher. It considers the values, biases and the actual presence of the researcher in the situation undergoing enquiry (Bryman 2016). This was an important consideration for me because not only did my research entail a qualitative component which served to corroborate an amount of survey data, but also because I am an academic member of staff conducting research in my own Faculty. My background, education, age, gender, value and prior experiences before working in Trinity College, combined with my understanding of the world, have all contributed significantly to my unique perspective; one that has the potential to pilot decisions relating to my choice of research methods and research outcomes.

I became very aware at an early stage of my work that my sheer enthusiasm for IPE as a way forward for healthcare education in Ireland could bias the entire research journey; from how the literature was reviewed, to the analysis, interpretation and reporting of data. On that basis, I needed to take account of my assumptions, preconceptions and position within the academic field, as well as reflect upon past and current experiences that may have influenced my decisions and interpretation of the data. This reflexive stance enabled me to unpack any notions of researcher detachment, objectivity and scientific neutrality with a view to ensure transparency throughout the research process. To effectively navigate this journey within, it was imperative for me to find 'space' and time for reflection; a challenging endeavour given that I had a full

time job, family commitments, and a life-long, time-consuming passion for competitive equestrianism, all coupled with PhD deadlines. Luckily, I found this 'space' while exercising horses which facilitated pursuit of both essential aspects of my life; with a modicum of enjoyment and relaxation. This strategy went further than simply facilitating reflection on my work and ensuring I remained physically fit to continue the competition agenda. In this place I found solitude. For me solitude sparked creativity because it gave my mind a chance to wander. In this space I reflected on the research problem, methodological approaches, data and its meaning as I saw it, and importantly, what the data could mean alternatively. Solitude also helped me to build the mental capacity to cope with the often scary challenges that come with PhD studentship. When I felt overwhelmed (a frequent occurrence!) my alone time afforded me the 'headspace' to put my work into perspective. It also helped me to get to know the new me; the one that was pursuing a new and exciting research agenda.

Fundamentally this reflexive standpoint helped me to capture the insights that enabled true engagement with my research, to be vigilant of my biases, and examine my place in the creation of new knowledge from my findings. Periodically throughout the thesis I refer to these reflexive deliberations, some of which represent excerpts from a memoire documenting my research activities, thoughts, feelings, challenges, ideas and insights. I entitled these writings 'the inward journey' which bestow the reader with a 'window' to my mind and thought processes when in solitude. I hope these reflexive perspectives will enrich the portrait of my PhD and afford a glimpse of my journey towards doctoral level thinking.

This thesis tells the story of my research and PhD journey.

Chapter 2 Background to Study

2.1 Introduction

This chapter builds on the previous introductory chapter. It presents the study background, contextualises the study from a national and international perspective and considers the global drivers of interprofessional working and education. It emphasises the rationale for adopting interprofessional working in the Republic of Ireland, and for an interprofessional educational strategy in undergraduate healthcare education to secure a collaborative workforce for the future. It discusses the problems and challenges with achieving this mission, providing justification for the purpose of this study.

2.2 The genesis of interprofessional education and interprofessional working

2.2.1 The nature and significance of interprofessional education and working

Twenty first century healthcare education has realised a global paradigm shift from uni-professional education to interprofessional education which aims to bring about effective interprofessional working between the different healthcare professions. This is with the ultimate aim to provide safer and more effective quality patient/client care (World Health Organisation (WHO) 2010). Interprofessional working is essentially an interpersonal process which brings about the achievement of goals that could not

otherwise be accomplished by a single healthcare professional. Collaborative acts of interdependence, flexibility, role-blurring, role overlap, sharing responsibility, and reflection are key components for its success (Bronstein 2003). However, the concept of 'interprofessional working' has been designated a myriad of interchangeable terms in the literature, such as, 'multidisciplinary', 'interdisciplinary', 'collaborative', 'interprofessional', 'transdisciplinary', 'cross-professional' or simply referred to as 'teamwork' (Horsburgh *et al.* 2001; Mackay 2004; D'Amour *et al.* 2005; Lindqvist *et al.* 2005a; Reeves *et al.* 2010b; Frenk *et al.* 2010). This resulted in a problematic conceptualisation of the term 'interprofessional working' and what is means to clinical practice. Possibly, the essential attributes of interprofessional working are best captured in the concept analysis of teamwork conducted by Xyrichis and Ream (2008), whereby teamwork is defined as:

'*a dynamic process involving two or more healthcare professionals with complementary backgrounds and skills, sharing common health goals and exercising concerted physical and mental effort in assessing, planning, or evaluating patient care. This is accomplished through interdependent, collaboration, open communication and shared decision-making, and generates value-added patient, organizational and staff outcomes'* (pg. 232).

The concept analysis identifies three dimensions of the consequences of teamwork: 1. for patients/clients- improved quality of care, value-added patient outcomes, and satisfaction with services; 2. for healthcare professionals- greater job satisfaction, recognition of individual contribution and motivation, and improved mental health; and 3. for the healthcare organisation - a satisfied and committed workforce, cost control and retention of staff with reduced turnover (Xyrichis and Ream 2008). Antecedents of

teamwork are identified as: open communication and information sharing, understanding of professional roles and common healthcare goals (Xyrichis and Ream 2008). These essential determinants for successful teamwork parallel the goals of interprofessional education, which has the potential to equip qualified healthcare professionals with the knowledge, skills, and attitudes required to work interprofessionally within a healthcare system, and address collaborative failures that threaten patient/client safety and delivery of high quality healthcare (WHO 2010).

In essence, IPE entails an educational process whereby students are given opportunities to share their learning with different healthcare disciplines in academic and/or clinical environments. The goal is for students to learn about the roles and responsibilities of different professions, understand the complexities involved in quality healthcare delivery, and learn the skills and attitudes required for effective IPW after they enter the workforce. By maximising the skills and strengths of each healthcare profession while at the same time preserving individual professional identities, IPE is now well recognised as an important step to bring about what the WHO refer to as '*collaborative practice-ready health workforce that is better prepared to respond to local health needs'* (2010:7). IPE is defined by the UK, Centre for Advancement of Interprofessional Education (CAIPE) as: '*occasions when two or more professions learn with, from, and about each other to improve collaboration and quality of care'* (CAIPE 1997:19). The principles underpinning IPE emphasise quality holistic care, positive healthcare outcomes, and wellbeing for individuals, families and communities (Reeves *et al.* 2013). Equal opportunities between healthcare professions are also a fundamental objective of IPE, whereby similarities, individuality and diversity are recognised and respected (Reeves *et al.* 2010b; Baker *et al.* 2011). IPE values the

identity and expertise of all healthcare professions, while aspiring towards shared goals (Barr and Low 2011).

As is the case with IPW, there is sometimes confusion about the meaning of terms associated with IPE that sees 'interprofessional education' used interchangeably with 'multiprofessional education' (MPE) (Hammick *et al.* 1998; Cooper *et al.* 2005). However, these terms have evolved over time to mean two different types of learning. Unlike IPE, MPE implies educational endeavour that does not necessarily have interaction, collaboration and teamwork as its focus (Hammick *et al.* 1998). In other words, when engaging in MPE students from different disciplines could be learning sitting beside each other in a classroom, but never interacting. This in reality amounts to uni-professional learning, which will not necessarily enable students to positively change knowledge, skills or attitudes for effective collaboration, or help solve patient problems as a unified team when they enter the workforce. 'Interprofessional education' is the most commonly used term in the global literature. Other terms include 'shared learning' (SL), or as is frequently the case in Ireland, 'interprofessional learning' (IPL). However, despite differences in the conception and use of these terms, it is generally agreed that both 'collaboration' and 'interaction' are essential elements within a true definition of IPE (Barr 2002; Cooper *et al.* 2005; Reeves and Hean 2013; Barr 2015 and 2016). In their analysis of IPE language trends, Paradis and Reeves (2013) noted that 'interprofessional' remains the most commonly used term, and one that became more prevalent over time in the literature than other related terms such as, 'multidisciplinary', 'multidisciplinarity' 'interdisciplinary' 'interdisciplinarity' 'multiprofessional', 'transprofessional' and 'transdisciplinary'. Henceforth, 'interprofessional education' and 'interprofessional working' are the terms utilised

throughout this research study to portray a type of education that encompasses the CAIPE (1997) definition and goals of IPE, and to depict the act of collaborative teamwork between the different healthcare professions.

The body of knowledge about interprofessional approaches to healthcare delivery has grown exponentially, and has shaped the global healthcare agenda over the last three decades. Care that is delivered with an interprofessional approach has resulted in many benefits for the recipients of care. Lemieux-Charles and McGuire (2006) report that the majority of studies investigating teamwork versus non-teamwork, found greater independence, better functional ability, and lower mortality among older patients/clients. In their randomised controlled trial, Hughes *et al.* (1992) also reported greater patient and caregiver satisfaction and morale in the care team intervention group than the control group. Teamwork was also reported to yield better opportunities for access to health services and for patient safety in studies by Hughes *et al.* (1992) and Janssen *et al.* (1992). IPW also has the potential to reduce patient complications, reduce length of hospital stay and admissions, and result in less tension among carers (Lemieux-Charles *et al.* 2006; West *et al.* 2006).

IPE as a way to nurture collaboration between undergraduate and post-graduate healthcare professionals has been the subject of many studies conducted for the best part of three decades. However at the time of this study, which completed data collection in 2012, the actual impact of IPE on IPW or patient/client care was virtually unknown, despite much rhetoric surrounding the necessity for this type of education (Zwarenstein *et al.* 2005; Reeves *et al.* 2009; Reeves *et al.* 2010b). A number of pioneering systematic reviews have sought to shed light on the actual usefulness of IPE in practice, and are useful indicators of a trend in IPE research that has moved from using less

robust, to more rigorous research methods in the IPE field. Zwarenstein *et al.* (2001) investigated the effects of IPE on professional practice and healthcare outcomes. Out of the 89 studies sourced that met inclusion criteria, none were considered sufficiently rigorous to demonstrate that IPE affects either professional practice or healthcare outcomes. An update of the review conducted in 2008 by Reeves *et al.* (2009), sourced six studies that met the inclusion criteria. Some of these demonstrated positive healthcare outcomes from IPE, but were deemed to lack methodological quality, making it hard to draw conclusions about the actual effectiveness of IPE in reality. However, the trajectory demonstrates potential for IPE to positively impact collaborative working and patient/client healthcare outcomes. The review update by Reeves *et al.* (2013) has added nine more studies that measured the impact of IPE interventions, compared to no intervention, to the original six studies selected for inclusion in 2008. Seven of these studies suggested a positive impact of IPE on care and/or collaboration. However as the researchers pointed out, a meta-analysis of study outcomes was not feasible due to heterogeneity in study designs and outcome measures. Whilst this review provides evidence base on the impact of IPE, and indicates the use of more rigorous designs that employed longitudinal measures, before and after methods, and randomised controlled trials by IPE researchers, it did not provide enough evidence to draw generalised conclusions about the actual effect of IPE on either professional practice or healthcare outcomes (Reeves *et al.* 2013).

It is really only in the last two years that sufficient robust evidence is emerging to show the actual effects of IPE. In 2016, Reeves *et al.* updated a previous 2007 BEME systematic review that aimed to classify IPE outcomes, investigate evaluations of IPE and discover the mechanisms that inform positive and negative IPE outcomes. This

review yielded a total data set of 46 high quality IPE studies. Results revealed a growing, albeit limited, body of evidence of benefits from IPE for patient/client healthcare, and indicated that students' collaborative skills and attitudes towards each other can also improve following IPE. This is an important development since support for IPE implementation in the academic setting sometimes falters due to scepticism about the true value of this type of education (O'Carroll *et al.* 2016).

Within what is now a multifaceted, dynamically changing and complex healthcare system, effective IPW is currently recognised worldwide as vital for safer, quality healthcare and primary healthcare delivery within healthcare services (Anderson *et al.* 2009; WHO 2010; Gallaher and Gallagher, 2012; WHO 2013b). IPW as a way to improve healthcare outcomes and IPE as a way to facilitate the attitudes and skills for IPW is at the forefront of what has become a global interprofessional movement.

2.2.2 The significance of the interprofessional movement: National and international perspectives

The goal to engender an interprofessional as opposed to uni-professional approach between the healthcare professions, has been driven by a global realisation that patient/client safety and standards of care can be gravely compromised by poor collaborative working and communication among the healthcare professions (WHO 1988; WHO 2010; Reeves *et al.* 2010b; WHO 2013a), potentially resulting in injury or even death (Brock *et al.* 2013). Identified as an essential prerequisite for collaborative working, IPE has been on the global healthcare education agenda since 1978, when the WHO Alma Ata asserted the necessity for a holistic and collaborative approach to healthcare to bring about effective primary healthcare delivery (WHO 1978a and b). Ten years on, the WHO reinforced the prominence of IPW in healthcare, in recognition

of growing evidence that IPW is potentially far more effective than uni-professional working to best provide quality patient/client care (WHO 1988). IPE subsequently established a firm presence in the WHO strategy to promote `Health for all by the year 2000', as a critical phase for the establishment of collaborative practice between healthcare professionals. Two pioneering reports published in 2010 further propelled the interprofessional movement forward, and these publications coincide with a growth in evidence about the impact of IPE on collaboration and on healthcare outcomes.

Subsequently a trend emerged whereby more robust research methods were incorporated in line with recommendations by Reeves *et al.* (2009). The first of these reports 'Framework for Action on Interprofessional Education and Collaborative Practice' presented a strategic vision for a collaborative workforce, conveying compelling worldwide evidence that IPE could potentially bring about better IPW (WHO 2010). A call to action ensued for policy-makers, educators, healthcare workers, and global healthcare advocates, to be proactive in the establishment of IPE and IPW in all Higher Education Institutions (HEI) and healthcare services worldwide, with particular priority given to fragmented and struggling healthcare systems (WHO, 2010). To address the particular challenges faced in 21st century healthcare services particularly relating to inequity and systemic problems within healthcare, the 2010 global 'Commission on Education of Health Professionals for the 21st Century' (Frenk *et al.* 2010) formulated a common vision and strategy for education in nursing, midwifery, medicine and public health. The commission underscored that collaborative learning approaches would best enhance collaborative working relationships within healthcare teams. Crucially, the commission called for worldwide interconnection

between healthcare and education systems to ensure a coordinated approach to interprofessionalism (Frenk *et al.* 2010).

From an Irish perspective, the Department of Health and Children (DOH&C) launched its Primary Care Strategy in 2004, reflecting a clear sense of the need for what was then termed as '*multidisciplinary teamworking'*, and recommending '*development of a range of common education modules for undergraduate medical, nursing and health and social care professionals'* (DOH&C 2004:35). IPE was advocated but prior to 2008, Irish policy documents directing education in healthcare focussed primarily on individual professions, as opposed to incorporating a wider interprofessional approach. There remained little systematic collaboration across professions, a dearth of interprofessional education initiatives in the form of training modules, and little conjoint use of clinical skills facilities (HSE 2009). IPE was not high on the Irish healthcare education agenda (Finucane and Kellett 2007; Warren *et al.* 2011). A design of education and training, supportive of an interprofessional policy approach and reflective of the necessary transformations of global healthcare systems to meet the needs of the healthcare population, was seriously required.

In 2009, the Health Service Executive issued an innovative document outlining new principles and recommendations for education, training and research practice in the healthcare system promising:

> *'better educated, fit for purpose health professionals working in teams, will deliver superior patient care'* (HSE 2009:27)

'high quality world-class education, training and research that makes a difference to patients, along the learning continuum, from the first day as an undergraduate student to the last day of professional practice'. (HSE 2009:11).

Financial challenges were mentioned in this document advising specific allocation of funding to incentivise interprofessional initiatives and redress the persistence of *'traditional restrictive silo approach to education and training'* (pg.12). This report marked a transition towards a philosophy of care and education grounded in interprofessionalism. Commitment to interprofessionalism for the Irish healthcare system remains clear and well-articulated in contemporary reports. IPW appeared as prominent theme in the recent 2013 document, Healthy Ireland: Framework for Improved Health and Wellbeing 2013-2025, stating that a *'flexible, multi-skilled and team-oriented workforce is essential to deliver on health reforms'* to secure the healthcare needs of the Irish nation (DOH 2013:26).

However, the actual realisation of true collaborative working can be problematic, with many constraints. In more recent years, the problems of achieving effective IPW and communication between the healthcare professions are captured in the position paper of the European Forum for Primary Care (EFPC) (Samuelson *et al.* 2012). The report reiterated that countries with established IPW within primary care teams and a robust primary healthcare system, yield improved clinical outcomes, better access to services, and are better able to manage the complex healthcare needs of the population today. However, it also revealed that in some countries many patients, or their social network, were still coordinating their own care because of ineffective IPW and inefficient primary health care services (Samuelson *et al.* 2012). From an Irish, perspective, current reports and figures indicate a shortfall in the Irish healthcare system for the

provision of effective IPW. Despite the vision of the HSE transformation programme that by 2010 '*everybody will have easy access to high quality care and services that they have confidence in and staff are proud to provide'* (HSE 2006:9), there is not as yet universal coverage for primary healthcare in Ireland (OECD 2018). Crucially, this scenario reduces the capacity for qualified professionals to become the '*collaborative practice-ready health workforce'* (WHO 2010:7) of the future, even if they had the benefit of IPE interventions during their undergraduate years. It also contributes to poor access to services for patients/clients (Committee on the Future of Healthcare 2017; OECD 2018), and any attempt towards incentivising patients to access care outside of already congested hospitals is diminished within this system, thus placing further pressure on the hospital based workforce (OECD 2018).

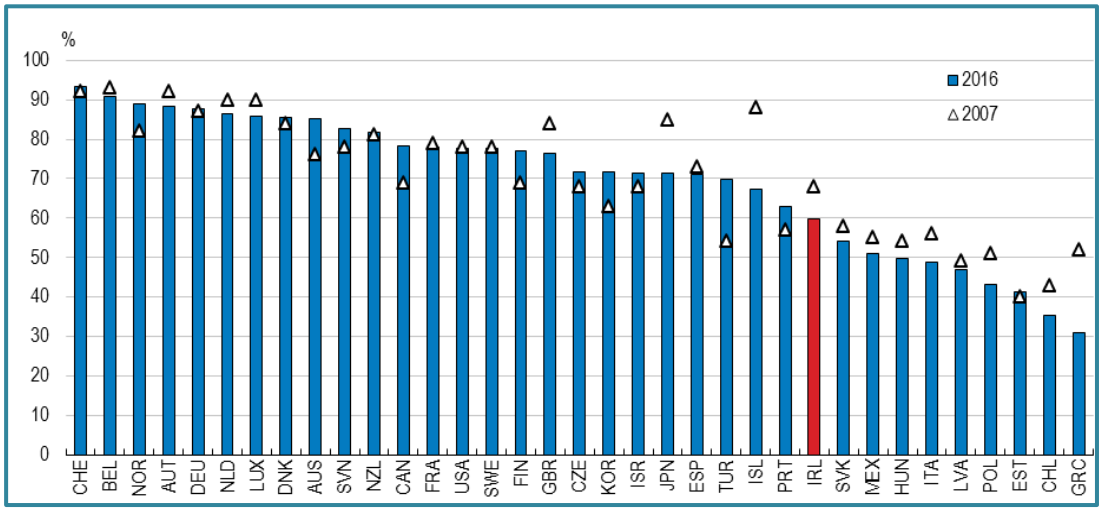
The need for collaborative approaches to care is amplified in the knowledge that our global healthcare systems today face new challenges brought on by an ageing population and an increase in prevalence of chronic illness (WHO 2010; Department of Health DOH 2013; Committee on the Future of Healthcare 2017), which has led to a greater requirement than ever for high quality non-acute care (Barrow *et al.* 2015). This is a significant concern not least for Ireland. Whilst the trend in Ireland portrays an overall picture of improved health within the population, and increased life expectancy (Committee on the Future of Healthcare 2017), demographic projections indicate that the dependency ratio is scheduled to rise in Ireland, with the number of people aged over 50 expected to increase by 600 thousand between 2016 and 2031 (OECD 2018). Furthermore, the current trend in population growth sees Ireland's rate of ageing higher than the EU average (DOH 2017). The population aged 65 years and over has already increased by one third since 2008 (DOH 2017), placing a considerable amount of extra

strain on the healthcare services and workforce in Ireland, and necessitating greater interdependency between the healthcare professions to care for older people, and the frail elderly, both in community and hospital environments (Robben *et al.* 2012; DOH 2017; OECD 2018).

A need for better staff communication and IPW in Ireland was among the findings from the Health Service Executive (HSE) 2017 'Irish National Patient Experience Survey' (HSE 2017a), and in the 2018 economic survey of Ireland undertaken by the Organisation for Economic Co-operation and Development (OECD). In 2016, Irish citizens featured among the most dissatisfied with a healthcare system by comparison to other OECD countries (Figure 2.1) (OECD 2108).

Figure 2.1 Citizens' satisfaction with healthcare system in Ireland in 2016 by comparison to other OECD countries

Source: OECD (2018)



Issues with satisfaction also emerged among the findings from the 2017, Irish National Patient Experience Survey (HSE 2017a), which revealed communication problems between patients and healthcare staff. These featured most prominently in the emergency department and on discharge, with 40% of patients reporting information

about self-care at home was inadequate (2017a). Furthermore, patients' families and friends reported not receiving sufficient information about care required after discharge and 48% reported difficulty with finding a staff member with which to express their fears and anxieties (HSE 2017a). Insufficient information about how to recover at home after discharge is a well-recognised precursor for readmission, and poses a greater risk of complications to patients (HSE 2017a). These figures emphasise an urgent need to properly address the socio-psychological as well as medical aspects of care, achievable only through effective collaboration between the relevant healthcare professions to address the holistic needs of the patient/client. Patients also reported that they required better communication from healthcare staff on ward rounds. In response to the survey (HSE 2017a), the HSE committed to the development of a programme of support for hospital staff *'in partnership with academic partners and key stakeholders already involved in communications skills training for healthcare professionals'* with the goal to improve communication from and between healthcare teams (HSE 2017b:13).

Of grave concern, collaborative and communication failures between healthcare professionals has been associated with medication errors (Dornan *et al.* 2009; Gallagher and Gallaher 2012; WHO 2017; Elliot *et al.* 2018), polypharmacy[1] (Bretherton *et al.* 2003; Bushardt *et al.* 2008; NHS Scotland 2012) and lack of information about side effects of medications (HSE 2017a). Recent figures have shown that medication errors are estimated to cause about 1700 deaths annually in the UK, and could contribute up to

[1] Polypharmacy refers to the use of multiple medications, a practice which can increase the likelihood of drug side effects and co-morbidities (NHS Scotland 2012).

22,000 deaths (Elliot *et al.* 2018). Not only are medication errors costly in terms of patient/client safety, they are costly from an economic perspective.

Last year the WHO identified '*Medication Without Harm'* as the central theme for the third Global Patient Safety Challenge (WHO 2017), reporting that medication errors are costing approximately 42 billion USD annually which amounts to approximately 0.7% of the total global health expenditure. Collective findings from two studies, EQUIP study[2] (Dornan *et al.* 2009) and PROTECT study[3] (Ryan *et al.* 2014), identified greater prevalence of medication errors among junior doctors, with team issues among the contributing factors. The need for IPE was identified, and featured as one of five main recommendations for interventions to prevent errors and enhance patient safety (Doran *et al.* 2009).

Pharmacists in Ireland are now legally obliged through the Irish Pharmacy Act (2007), to provide a more patient centred approach than the traditional act of merely 'dispensing' medications, and better collaboration has been called for between doctors and pharmacists (Gallagher and Gallagher 2012). Despite this, findings from the 2017, National Patient Experience Survey, revealed that thousands of patients before discharge reported that they were not informed about the potential side effects of medication, or the associated signs of danger (HSE 2017a). This finding is one that arguably could be a result of collaborative failure on the part of members within the

[2] The EQUIP study (Doran *et al.* 2009) was commissioned by the UK General Medical Council and consisted of a comprehensive investigation into the prevalence and causes of prescribing errors by first year doctors. The interplay between doctors' educational backgrounds and factors in the practice environment were the primary focus.

[3] The PROTECT (PRescribing Outcomes for Trainee Doctors Engaged in Clinical Training) study (Ryan *et al.* 2014), investigated the prevalence and causes of prescribing errors amongst junior doctors, finding that team factors including poor quality of drug information, and the number of different individuals (and teams) involved with a patient's care pathway were perceived causes of errors.

healthcare team. It could also be a consequence of a failing within the Primary Care Strategy (DOH&C 2004) to include the pharmacist as anything more than a bystander in the care process (Henman 2008). The UK 2018, report of the Short Life Working Group on reducing medication-related harm called for:

'*Improved shared care between health and care professionals; with increased knowledge and support'* (*pg. 24)*, and that '*professionals should also work together to help reduce inappropriate polypharmacy and overmedication'* (pg. 14).

The collective message from these global and national documents is that healthcare systems currently face serious challenges brought about by demographic changes, increased incidence of chronic diseases, patient/client safety issues, quality care issues, and patient/client dissatisfaction with communication and information provision from healthcare professionals. High-quality, safe patient/client care delivery is a complex activity that demands healthcare professionals communicate and collaborate effectively. The call to implement interprofessional rather than uni-professional educational and working strategies has been addressed, but remains far from optimal in the Irish healthcare service. It is clear that IPW in Ireland needs to be enhanced and facilitated at the government policy and decision making level, but it also needs to be supported by educational strategies that can equip Irish healthcare graduates with the skills to become an interprofessional workforce. Healthcare and education are interdependent, and the Irish healthcare and education government departments need to work in unison to develop common strategies and guidelines for the implementation of suitable healthcare education across academic and clinical settings nationally. Interprofessional education provides a potentially suitable educational strategy to achieve these outcomes.

With that said, altering the curricula or designing any type of educational programme whereby a number of different healthcare professions participate, will yield a multitude of challenging variables (Anderson and Thorpe 2008). Hence, adapting uni-professional healthcare course curricula towards an approach grounded in interprofessionalism is not an easy feat. The complexities and challenges currently encountered and needing resolution, give rise to the specific purpose of study.

2.3 Implementation of interprofessional approaches in undergraduate healthcare education: complexities and challenges

Whilst there are strong global and national endorsements for interprofessional working and education at government, professional and institutional levels, effective collaboration between the healthcare professions can be difficult to accomplish. The complexities and challenges involved are paralleled by those inherent in the pursuit of successful and sustainable IPE. Despite widespread acknowledgement of the benefits of IPW and IPE, healthcare and healthcare education still tend to be structured around the principle of professional boundaries, with the division of roles and responsibilities therein (Baker *et al.* 2011). Consequently, graduates often enter their professional careers with misunderstandings about the roles of other professionals (Ateah *et al.* 2011). Furthermore, many graduates will specialise in areas of healthcare, which has the tendency to immerse healthcare professionals more deeply into the culture of their own disciplines (Hall 2005).

Healthcare professions have historically functioned within traditional power structures grounded in separate ideologies, with distinct professional identities, which can be problematic for team dynamics (Hall *et al.* 2005; Baldwin 2007; Baker *et al.* 2011;

Gallaher and Gallagher 2012; Reeves *et al.* 2016). Confronted with interprofessional logic, healthcare professionals often strive to preserve their individual professional identities and boundaries, rather than find common ground (Baker *et al.* 2011). Confusion and uncertainty about roles and responsibilities of other disciplines encourage healthcare professionals to preserve their professional identities and work independently of each other (Thistlethwaite and Nisbet 2007; Baker *et al.* 2011). The tendency for disciplines to work somewhat in isolation from, or in competition with each other, presents a scenario often termed in the literature as 'tribalism' or 'turf barriers'. This contradicts efforts to combat resistant attitudes and address prejudices (Hall 2005; Baldwin 2007; Frenk *et al.* 2010; Baker *et al.* 2011).

Maintaining a system of uni-professional education in Irish HEI's will do little to fix these issues. As Frenk *et al.* (2010) argued professional education has lagged behind mainly due to static and fragmented curricula, which yield healthcare professionals, ill-equipped to deal with the costly and complex demands faced by healthcare systems. Conversely, undergraduate IPE endeavours to address these challenges by encouraging students to recognise the value of IPW in the pursuit of quality patient/client care before negative viewpoints or tribal attitudes become entrenched. It engenders understanding of the roles and responsibilities of other professions while enhancing realisation that healthcare delivery needs to transcend professional boundaries and originate from effective collaboration, communication, coordination and interdependency between healthcare disciplines (D'Amour *et al.* 2005; Baker *et al.* 2011; O'Carroll *et al.* 2016). IPE has the potential to break down professional stereotypes, encourage non-hierarchical relationships, and foster equality of status and respect between professions (Hall 2005; Baldwin 2007; Foster and Macleod-Clarke 2015).

However, the implementation of IPE entails negotiating a multitude of logistical barriers relating to scheduling, timetabling, sourcing common learning spaces, resources, funding, costs, manpower and planning (Curran *et al.* 2010; Ryan 2010; Nestel *et al.* 2010: Cusack *et al.* 2012; Cusack and O'Donoghue 2012). Varying lengths of academic courses (Horsburgh *et al.* 2001) and different assessment criteria also pose a dilemma for IPE developers (Reeves and Freeth 2002). Closely associated with a challenge to secure common learning spaces for combined disciplines, the 'siloed' approach to healthcare education[4] (Gilbert 2005b) represents a particularly difficult problem for this institution, because the students receive the academic component of their courses in different locations around the city[5].

There are however, other antecedents for attainment of IPE goals. Whilst the aforementioned barriers are extremely difficult to resolve, potentially the most challenging obstacle relates to the nature of attitudes held among undergraduate healthcare students towards the idea of sharing their learning with different healthcare professions, as well as towards the practice of IPW (Reeves and Freeth, 2002; Baker *et al.* 2011; O'Carroll et al 2016). The nature of students' attitudes appears to be a critical determinant for success and sustained success of IPE, and for the subsequent achievement of effective IPW. When considered in the light of the Contact Hypothesis[6], perceptions of inequality between different professions are problematic for effective IPE (Allport 1954). Studies have shown that students with negative attitudes

[4] The 'siloed' approach to education is a term used to depict healthcare education that takes place in silos which separate the professions. It can refer to actual buildings or take on a metaphorical connotation.
[5] This situation has been somewhat alleviated from a clinical IPE perspective with the recent development of an interprofessional training ward at one of our affiliated hospitals.
[6] A perception of equality between groups is one of the conditions for successful group interactions according to the Contact Hypothesis (Allport 1954). This concept is explained in the theoretical framework, chapter 4.

towards IPE are often those that gain the least from it (Coster *et al.* 2008; Just *et al.* 2010). Reeves *et al.* (2009) argues that positive attitudes towards IPE are associated with positive attitudes to IPW. Hence, recognising and interrogating negative attitudes, and perceptions of inequality become essential tasks for IPE facilitators for successful IPE outcomes (Reeves and Freeth 2002; Horsburgh *et al.* 2006).

Intuitively, one might expect that students develop negative attitudes towards learning with other disciplines over time, as they develop a professional identity through the socialisation process (Turner 1999), and adopt the skills, attitudes, values, and beliefs of their profession while embracing the occupational culture of the group (Merton *et al.* 1957; Michalec et al 2013). There is however, overwhelming global evidence[7] to indicate that undergraduate healthcare students enter their courses with both positive and negative attitudes about healthcare professions (Hind *et al.* 2003; Hean *et al.* 2006a and b; Michalec *et al.* 2013), and towards the concept of sharing their learning with other disciplines (Hind *et al.* 2003; Coster *et al.* 2008, Ahmad et al 2013). Many of these attitudes appear to be grounded in stereotypes and are thought to create barriers to students' engagement with IPE (Foster and Macleod Clark 2015). There is also evidence to suggest that students enter their course with an amount of already established professional identity (Adams *et al.* 2006; Stull and Blue 2016), sometimes affecting their willingness to engage with IPE and exerting influence on how they view the characteristics of their own and other professions (Hind et al 2003; Adams *et al.* 2006). Learner characteristics relating to choice of healthcare profession, age, and gender in particular, also appear to influence the aforementioned (Pollard *et al.* 2006; Adams *et al.* 2006; Coster *et al.* 2008; Talwalker *et al.* 2014).

[7] This body of evidence is considered in the literature review chapter 3

In Ireland more research is needed to inform the implementation and design of IPE in the higher education sector. Little is known about the attitudes of undergraduate healthcare students towards IPW and IPE in Ireland, or how they evolve with underlying factors that could potentially shape them, such as, professional identification or professional stereotyping. Furthermore, the most appropriate time to introduce IPE in healthcare courses is unresolved in the global literature, with some researchers suggesting IPE should be introduced when professional identity is secure (Oandasan *et al.* (2004), and others arguing that IPE is best provided before identities are developed (Hind *et al.* 2003). This is worthy of examination in the context of Irish healthcare education to add to the debate. The longitudinal design of this study could give an indication of when best to place IPE, based on potential changes in attitudinal measures and strength of professional identity scores between the first and second year of the programme.

A cohort of undergraduate dietetic, medical, nursing, occupational therapy, pharmacy and physiotherapy students, studying in the Faculty of Health Sciences in this university is the sample of choice, as they represent the frontline healthcare courses available in this institution. The use of a non-healthcare comparator group from an alternative Faculty should help to ascertain if attitudes are akin to a healthcare student cohort studying in the same Health Science Faculty, or are representative of wider society.

This research study is timely, reflecting a national, European and global imperative to educate new healthcare professionals for effective interprofessional working. It will make a unique contribution to the IPE field from an Irish perspective, and inform the development and implementation of effective future IPE programmes in this institution, and potentially other HEI's around the country. It could yield valuable insights as to

how IPE should be designed in terms of participation, content, timing, and if IPE strategies are required to interrogate negative perceptions. Ultimately it is hoped that through informed IPE interventions, this study will play a part in contributing towards the provision of a collaborative ready workforce able to take on the delivery of safe, quality healthcare in the Republic of Ireland.

2.4 Conclusion

The global drivers for interprofessional working and education and significance of interprofessionalism as a way forward for quality patient/client delivery have been considered. The educational strategy best positioned to provide a collaborative workforce in the pursuit of this goal. It provided a background context for this study and justification for the study purpose, spotlighting the complexities and challenges involved for the implementation of interprofessional education in Higher Education Institutions. The next chapter presents a review of the literature that provided a framework for this research and informed the development of the study aims and objectives.

Chapter 3 Literature Review

3.1 Introduction

This chapter presents a review of the literature that framed this research study and informed the development of the study aims and objectives. It presents three key themes which emerged from the literature, providing a framework for this enquiry. These include the significance of professional identity in interprofessional education and working, stereotyping among the healthcare professions, and readiness for students of healthcare to learn interprofessionally. The value and importance of interprofessional working for safe, quality patient/client care comprises the underlying fundamental principle.

The chapter is divided into three main sections which navigate the literature as it pertains to each theme. The influence of learner characteristics and socio-environmental experiences relating to IPE, and the relationships between strength of professional identity, stereotyping, learner characteristics and readiness for interprofessional learning are explored. This is followed by a summary/overview of the main arguments fundamental to this inquiry and the study aims and objectives. The chapter concludes with a reflective section illustrating the researchers' thoughts and conceptualisations about the significance of IPE and IPW for a quality healthcare service and the potential challenges that need to be conquered.

3.2 Search strategy

Relevant literature was sourced for this review prior to commencement of the study in 2011. Following data analysis, the review was then updated to reflect the most up to date literature on the topic up to 2017. As noted in the previous chapter (section 2.2.1), the terminology describing an educational endeavour that involves healthcare professionals 'learning with from and about each other' (CAIPE 1997:19) varies considerably in the literature, making comprehensive searching quite challenging. From a chronological perspective, it became apparent during the search that 'interprofessional' evolved as the preferred term over time. The choice of terms for the updated literature search were augmented by the writings of Paradis and Reeves (2013), who noted in their analysis of language trends that 'interprofessional' is the most commonly used term and became more prevalent over time in literature titles than 'multidisciplinary,' 'multidisciplinarity', 'interdisciplinary', 'interdisciplinarity,' 'multiprofessional', 'transprofessional', 'shared' and 'transdisciplinary'. However, all these aforementioned terms were included to scope the literature as these less commonly used terms are still in use. Key words used in combination with the aforementioned terms broadly related to 'education' 'learning' 'healthcare student' 'student' 'undergraduate', 'medical', 'nursing', 'dietetics', 'occupational therapy', physiotherapy', pharmacy', 'interprofessional working or teamwork' 'attitude or perspective or opinions or beliefs' 'professional identity' stereotypes' 'readiness'.

Using the databases Pubmed, CINAHL, PsychINFO, Proquest, Embase, Web of Science, Cochrane, and Google Scholar, published research in English was accessed for the time period 1960 to 2011 before study commencement, and then accessed from

2011 to 2017. Manual searches were conducted of all relevant journals and reference lists from articles.

Section 1

3.3 The role of professional identity in interprofessional education and working.

3.3.1 Introduction

There is a growing body of literature exploring the role of professional identity in the development of attitudes towards IPE and IPW. This section of the review presents dilemmas and current debates that arise for best IPE practice as they relate to this theme. Whether or not IPE is best positioned in the context of strong or weak student identity, how best to manage differences in strength of identity between professions, the significance of power relations, and best timing of IPE activities, frequently feature among the debates. Whilst the role of professional identity in IPE and IPW has sparked argument and controversy among IPE researchers and champions, it is agreed that gaining better understanding of professional identity appears essential to provide insights into how interaction between students during shared learning could be optimised, and to guide the design of IPE activities (Mazur *et al.* 1979; Funnel 1995; Parsell and Bligh 1998; Barnes *et al.* 2000; Tunstall-Pedoe *et al.* 2003; Hind *et al.* 2003; Carlisle *et al.* 2004; Mandy *et al.* 2004; Oandasan *et al.* 2004; D'Eon 2004; Barr *et al.* 2005; Adams *et al.* 2006; Horsburgh *et al.* 2006; Coster *et al.* 2008; Baker *et al.* 2011; Stull and Blue 2016).

3.3.2 The significance of professional identity development among undergraduate healthcare students.

Belonging to a professional group brings about the development of a professional identity through socialisation (Turner 1999). This process enables students to learn practices akin to their profession, and adopt the skills, attitudes, values, and beliefs of their profession (Schein 1978; Adams *et al.* 2006; Coster *et al.* 2008; Michalec *et al.* 2013; Stull and Blue 2016). This is a complex, cognitive mechanism which facilitates healthcare students to, not only learn the skills required to work within their profession, but also to adopt the occupational culture of their profession (Merton *et al.* 1957). In other words, professional identity enables students to think, feel and behave like a member of their profession which, from an occupational standpoint, is an essential and necessary process to ensure an operational healthcare service (Leavitt *et al.* 2012).

The processes of professional identity development and socialisation are likely to begin before students ever start their healthcare courses (Hind *et al.* 2003; Adams *et al.* 2006; Horsburgh *et al.* 2006; Hean *et al.* 2006a, 2006b; Coster *et al.* 2008; Michalec *et al.* 2013; Stull and Blue 2016), and quite possibly as early as childhood (Adams *et al.* 2006). Interactions with family/friends from healthcare backgrounds, as well as images of healthcare professionals in the media, are thought to be instrumental in the development of these processes (Tunstall-Pedoe *et al.* 2003; Coster *et al.* 2008). This means that early IPE activities are likely to be taking place with an amount of professional identity already formulated among the participants. Some believe that healthcare students at the start of a course could not have a professional identity as such, as they have yet to learn the values and skills associated with their profession

(Horsburgh *et al.* 2001). Whilst this makes a lot of intuitive sense, evidence is strongly weighted to the contrary.

Using the Readiness for Interprofessional Learning Scale (RIPLS) (Parsell and Bligh 1999) and the Interdisciplinary Education Perception Scale (IEPS) (Luecht *et al.* 1990), the recent quantitative study by Stull and Blue (2016) measured strength of professional identity among a large, diverse cohort of first year undergraduate students (n=864) from ten professional disciplines including, occupational therapy, clinical laboratory science, dentistry, dental hygiene, dental therapy, medicine, nursing, pharmacy, public health, and veterinary medicine. Students presented with a high degree of professional identity on entry to their programme, accompanied with a sense of belonging to their profession of choice. These findings suggest that identification with their professions had already formed prior to starting their courses, and echoes finding from earlier studies. However, an IPE intervention had no effect on students' professional identity. A potential problem with this study relates to the scale used to measure professional identity whereby the second RIPLS subscale was used for this purpose, the internal consistency of which was subject to scrutiny (McFadyen *et al.* 2005 and 2006). McFadyen *et al.* (2005) found that the internal consistency of the original three factor scale model (Parsell and Bligh 1999) was improved with their new four factor scale model, whereby the second subscale for measuring professional identity was improved by creating two subscales each measuring negative and positive professional identity. Further critique of the use of this measure features among the arguments by Mahler *et al.* (2015) outlined in section 3.4.3. The use of a scale devised specifically to measure professional identity such as the validated Professional Identity Scale (PIS) originally

developed by Brown *et al.* (1986), could have been a more effective instrument to measure this construct.

Stull and Blue (2016) corroborate the findings from earlier studies. In their quantitative study, Adams *et al.* (2006) measured the strength of professional identity among a large sample of students (n=1254) from ten frontline and auxiliary healthcare professions including audiology, medicine, midwifery, nursing, occupational therapy, pharmacy, physiotherapy; podiatry, radiography and social work, on commencement of their courses. A relatively strong professional identity was apparent on course commencement among these students. Similarly Coster *et al.* (2008) also found professional identity was strong on course commencement among eight healthcare professions including nursing, medical, dentistry, midwifery, dietetics, occupational therapy, physiotherapy and pharmacy (n=1683). However, professional identity declined over the course of four years with the greatest change observed between baseline at course commencement and the start of the second year. This was interpreted as the reality of clinical practice having an impact on students' initial enthusiasm for their course of choice. These studies are also in support of earlier findings by Hind *et al.* (2003) with their sample of medicine, nursing, dietetics, pharmacy and physiotherapy students (n=933) and Mandy *et al.* (2004) with their sample of physiotherapy and podiatry students (n=130).

Collectively, these findings highlight that students present with relatively high professional identity irrespective of healthcare course and strongly indicate that professional identity is formulated before course commencement. However, the findings to be interpreted with some caution as the high professional identity scores attributed by the students, could be affected by natural enthusiasm and motivation

which could be expected when students commence a course of choice. Given that these are first year students, there is potentially greater likelihood of social desirability bias, whereby socially acceptable or favourable answers are presented (Aldridge and Levine 2001).

Nonetheless, with these limitations acknowledged, it could be hypothesised that students in the Irish context are likely to enter their courses with an already formed amount of identification with their chosen profession. The critical considerations for IPE implementation and design in the light of the aforementioned evidence are two-fold. The first lies in the argument that the student is better placed to engage with shared learning if professional identity is formulated (Parsell and Bligh 1998; Baker *et al.* 2011; Stull and Blue 2016). Based on these findings that clearly demonstrated strong professional identity among these first year students, it would then seem logical to implement IPE early in undergraduate academic programmes. The second consideration needs to take account of another debate relating to how strong or 'formulated' does professional identity need to be for IPE to be effective, and whether or not IPE is best executed in the presence of a weak or a strong professional identity.

The predominant concern among many IPE champions is that early IPE could be ineffective in the face of immature professional identity among its participants. Hence, studies have claimed that it is advisable to wait until a sound professional identity has been established, before ever utilising interprofessional learning styles. It is thought that neophytes, learning within the larger interprofessional group, could feel a sense of weakening and threatened identity instead of strengthening identity (Mazur *et al.* 1979; Funnell 1995; Parsell and Bligh 1998; Barnes *et al.* 2000; Tunstall-Pedoe *et al.* 2003; Mandy *et al.* 2004; Oandasan *et al.* 2004; Freeth *et al.* 2005; Baker *et al.* 2011; Stull and

Blue 2016). Some have argued for early IPE with continued activities throughout the duration of the academic courses (Areskog 1988; Horsburgh *et al.* 2001). The current perspective in Ireland appears divided on this issue with some IPE champions believing IPE should take place early and continue up to graduation (Health and Social Care Interprofessional Learning Conference 2015) and others favouring later IPE[8].

This debate has a long history and featured in the early work by Mazur *et al.* (1979) and Funnel (1995), both of whom raised concerns that IPE implementation in the face of weak professional identification, could result in inflexible role boundaries and role insecurity. Mazur *et al.* (1979) argue that students need to be secure in the skills relating to their own profession, before they are able to learn effectively learn shared skills with other disciplines. This argument was corroborated by Funnell (1990), who added that for IPE to realise one of its primary goals, that is, students learn about the roles of other professions, they need to be firstly secure in their own roles. Oandasan *et al.* (2004) added that before students can actually work successfully on an interprofessional team, they must first be secure enough to work in their own professions.

From the perspective this debate, there appears far less support in the IPE literature for the argument supporting early IPE. However, salient arguments have been proposed. Mandy *et al.* (2004) posed a solution to help overcome problems with weak professional identity coupled with inexperience among junior students, suggesting IPE maybe best placed after a period of clinical exposure. The rationale proposed was that if students worked on interprofessional teams alongside professional colleagues with

[8] In this institution, IPE takes place in third year in the belief that professional identity may be weak in the junior and senior freshman years.

patient/clients, IPE could be seen as more real and therefore more valued irrespective of their level of identification with their own profession (Mandy *et al.* 2004). Michalec *et al.* (2013) argued that regular exposure to the clinical setting with other healthcare professionals in '*real time'* patient/client care (pg. 211), could translate into better understanding among students for both their own roles and that of other professions. Hence, early IPE, provided it is after clinical exposure, could be a compromise to address the dilemma of early IPE and underdeveloped identity. However, for this idea to work in classroom, all the participating professions will need to have completed clinical placements. This could be quite difficult to execute due to conflicting schedules and timetables, and the likelihood of all professions experiencing clinical exposure at an early stage is small in reality (Horsburgh *et al.* 2001; Tucker *et al.* 2003; Morrison *et al.* 2003; Oandasan and Reeves 2005b; Ryan 2010).

A plausible solution to these arguments lies in the view that IPE could facilitate development of interprofessional identity. To work interprofessionally, Barnes *et al.* (2000) argued that the development of an interprofessional identity is just as important as developing a professional identity with students' own professions. Lidskog *et al.* (2008) supports this idea suggesting that professional socialisation during healthcare education needs to entail a dual socialisation process whereby a balance is achieved between students' recognition of individual professional identities, and a shared professional identity, which comes with being a member of a larger interprofessional healthcare group. In support of early IPE, and drawing from the work of Atkins (1998) about the issue of tribalism for interprofessionalism, Carlisle *et al.* (2004) asserted that the more established individual professional identities become, the harder they are to break down, and shaping new identities for an 'interprofessional' identity is likely to be

all the more difficult once individual group identities have become established. These perspectives give rise to the opinion among some proponents of IPE that IPE is best implemented early before identities become established (D'Eon 2004). The medical and nursing students (n=34) in their qualitative study by Cooke *et al.* (2003), showed reluctance to 'let go' of their professional identity following IPE. Based on a belief that the longer students are together with their own disciplines, the stronger they will identify with each other, D'Eon (2004) recommended early IPE, concerned that the stronger students' identify with their own profession, the less likely they will want to engage in shared learning with other disciplines. This argument is supported by theories within the realm of social psychology such as Social Identity Theory, which asserts that members of a group will identify more strongly with, and prefer members of their own group[9] (Tajfel 1978).

However, the aforementioned arguments of when best to introduce IPE in terms of identity, appears to revolve around an assumption that students' professional identity strengthens over time. The ensuing discussion produces evidence that not only does strength of professional identity differ between professions, it can in fact decline among some disciplines over time (Coster *et al.* 2008).

3.3.3 Variations in levels of identification between professions.

As seen from the aforementioned evidence, planning IPE implementation poses a dilemma in terms of the strength of students' identity. This would be a much easier issue to resolve if identities developed and strengthened in a similar way over time among the healthcare student disciplines. However, this does not appear to be the case.

[9] Social psychology theories underpinning this study are considered in detail in chapter 4, section 4.4.2.

Dissimilarities in level of professional identification between healthcare professions, present another prevailing factor to consider for IPE implementation. Studies have identified variations in levels of identification between professions and at various stages during training (Carpenter 1995a; Barnes *et al.* 2000; Hind *et al.* 2003; Adams *et al.* 2006; Hean *et al.* 2006a; Coster *et al.* 2008; Hood *et al.* 2014). This gives rise to the question of how effective IPE activities could be in a group with mixed levels of professional identity between the disciplines, and when best to implement IPE given the likelihood of fluctuations in identity during the course of the academic programme.

One of the earliest studies to report differences in professional identity between participants, was conducted by Carpenter (1995a) whose primary aim was to explore stereotypes among nursing (n=16) and medical students (n=23), before and after participation in an IPE programme. In what appears to be a secondary aim, they also measured strength of professional identity before IPE commencement. Carpenter found nursing students had a much weaker identity than medical students. He attributed this weaker identity to awareness among the nursing students that their profession was perceived in society as having low status. Limited insights can be drawn from this data as the study fell short of reporting professional identity scores after IPE, which if they had been measured and compared, could have gleaned useful insights into the relationship, if any, between IPE and professional identity. This limitation underscores the necessity for future research to measure these variables after IPE, as it would have been valuable to know if sharing learning with medical students had the effect of strengthening or weakening the already weaker identity among the nursing students.

Whilst Carpenters' study (1995a) was pioneering study for that time, and one that has been drawn upon and referred to in many subsequent works in the IPE field, the

findings were unusual compared to later studies that reported a very different scenario, whereby the medical students demonstrated weaker professional identity than nursing and other disciplines. Later study samples reflected the evolution of more healthcare professions traditionally grouped as 'allied healthcare professions' (Gilbert 2005b; Baker *et al.* 2011), who were developing their own identities within the healthcare realm. The inclusion of these gave more scope for investigating effects of IPE on student identity, but also for ascertaining differences between the professions and the potential reasons for such differences. Among these included occupational therapy, physiotherapy and dietetics. As an essential component for modern day interprofessional working, these frontline professions became part of later research study samples, as opposed to earlier studies that traditionally reflected nursing, medicine and less frequently, pharmacy. Among the first of these to examine differences in group professional identity included Hind *et al.* (2003), Hean *et al.* (2006a), Adams *et al.* (2006), Coster *et al.* (2008) and later Hood *et al.* (2014).

Adams *et al.* (2006) found physiotherapy students entered with a remarkably strong professional identity, and along with occupational therapy students, had stronger professional identity than medicine, nursing, pharmacy and other auxiliary healthcare professions. By way of explanation, the authors noted that different selection procedures took place between these professional groups, with certain schools favouring a strong identity (Adams *et al.* 2006). These findings share similarities with earlier studies by Hind *et al.* (2003) and Hean *et al.* (2006a) who also found particularly strong professional identity among physiotherapists more so than other groups. Coster *et al.* (2008) found pharmacy and, unlike Carpenter (1995a), medical students had the lowest professional identity scores on course commencement, while dietetics, physiotherapy,

occupational therapy and nursing were among the highest respectively. More recently, Hood *et al.* (2014) corroborated much of this earlier data, finding nursing and physiotherapy students had stronger professional identity than medical students.

A potential concern among findings, acknowledged by Hood *et al.* (2014), relates to the diversity in sample sizes representing the disciplines, with some groups as small as 20 participants and others reaching 600. This is a common problem within IPE studies as most sample will vary in size unless equal numbers are selected from each group. Apart from reducing the generalizability of findings relating to professions with the lower sample sizes, the negative effect of violation of assumptions on the validity of a test increases with unbalanced sample sizes (Field 2013; Rusticus and Lovato 2014; Laerd 2015). It is not entirely clear from these studies how the disparities in samples sizes were dealt with statistically.

The evidence showing differences among the professions could suggest that professional identity is shaped by course culture and experiences. Indeed, in Carpenters' study (1995a) perceptions of low societal status were considered the reason for low identification among nurses. There is something of interest about the physiotherapy group with their remarkably strong identities. From a societal perspective, it could be that the profession of physiotherapy is considered more prestigious given its association with sports (Mandy *et al.* (2004) and because like pharmacy, has the potential work independently in business. Perhaps been grouped together under the umbrella term 'allied healthcare professions', has strengthened the determination of these groups to establish their individual status among the other professions. Gilbert (2005a) and Baker *et al.* (2011) argue that these professions lost autonomy and standing among the healthcare professions because of this clustering of

the groups. Whilst the evidence depicts stronger identity among some professional groups that others, it should not be interpreted as necessarily implying weak professional identity among the other groups per se. This is because even though scores maybe statistically significantly higher for some disciplines, the other scores from other disciplines do not necessarily fall into a low range.

There remains little by way of explanation for differences in strength of identity among healthcare students, making this an area worthy of further investigation now that interprofessionalism is the way forward for healthcare education and working. These studies very clearly spotlight the necessity to investigate differences in professional identity between the professions rather than assume similarity, regardless of which side of the 'strength of identification/IPE timing' debate one ascribes to. This is important for two reasons. Firstly, it is not clearly understood how mixed levels of identity could affect the learning achieved or the group dynamics during IPE. Secondly, strength of professional identity has been found in some studies to correlate with readiness for shared learning, and to predict readiness for shared learning (Hind *et al.* 2003; Adams *et al.* 2006)[10]. Hence, differences in group identification should be explored to better understand group dynamics involved, and inform how IPE can be best executed in the presence of identity variation between individuals and disciplines.

A further slant to this debate emerges with evidence to show that strong professional identity is not necessarily sustained over the course of training. Professional identity does not appear to be static and its dynamic and changing nature is another important aspect to investigate in order to fully inform IPE design. Intuitively, one might expect

[10] Evidence regarding correlations and predictions is considered in section 3.7.

professional identity scores to increase over time, as students develop skills and adopt the occupational culture and values of their professions through education and clinical practice (Merton 1957). However, studies have shown this cannot be assumed. Strength of professional identity has been found to fluctuate among students during the course of an academic programme, right up to and following graduation (Barnes *et al.* 2000; Adams *et al.* 2006; Coster *et al.* 2008). Socialisation, different stages of training (Adams *et al.* 2006) and the 'reality' associated with clinical practice (Coster *et al.* 2008), have been offered as possible explanations.

Coster *et al.* (2008) reported a significant decline in strength of professional identity over the course of four years among nursing, dietetics and dentistry students. The biggest decline was observed between course commencement and the beginning of the second year. This drop in identity scores was thought to result from 'reality shock' experienced during the first year practice placements that these particular student groups received. In contrast to findings by Coster *et al.* (2008), Barnes *et al.* (2000) and Adams *et al.* (2006) suggested that there is possibly less demarcation in levels of professional identity as students get closer to graduation. In their longitudinal before and after study involving qualified psychologists, psychiatrists, community psychiatric nurses, occupational therapist and social workers (n=71) participating on a two year IPE course, Barnes *et al.* (2000) hypothesised that discipline specific professional identity would decrease among the individual professions as they became more 'interprofessional' following participation in IPE. However, they found professional identity from an interprofessional team perspective was already strong, with IPE having only a small effect in reducing identification between the professions. It appeared that

professional groups became more similar in terms of professional identity over time, and began to form stronger identity with interprofessional teams.

Differences in strength of professional identity, the reason levels of identity change and the unique development of professional identity among individual professions from the start to end of their courses is not entirely understood. The various stages of education and training, the clinical and academic experiences encountered by the groups and the socialisation process, are likely to play a part. However, as professional identity strengthens between the in-group, boundaries inevitably develop. These can lead to territoriality and tribalism and pose one of the greatest challenges for the laudable goals of IPE and collaborative working.

3.3.4 The significance of power relations among the healthcare professions.

Social Identity Theory (SIT) postulates that individuals naturally favour their own 'in-group' over the other 'ou*t*-group'. It highlights the power of perceived attributes of groups to affect relations and group dynamics, whether or not the attributes actually reflect reality (Tajfel *et al.* 1971; Turner 1999; Hean at al. 2006b; Michalec *et al.* 2013)[11]. In line with the underlying principles of SIT, IPE studies have demonstrated that during interprofessional interactions, group participants favour their own identity and establish their identities through comparing attributes of their own and other groups (Mandy *et al.* (2004); Hean *et al.* 2006a and b; Lidskog *et al.* 2008; Michalec *et al.* 2013). Professional identification, while psychologically beneficial to individual and organisation (Tajfel and Turner 1979; Leavitt *et al.* 2012) has a potential downside, insofar as it generates social categorisation with subsequent stereotyping (Turner 1999).

[11] Social Identity Theory (SIT) is detailed in chapter 4, section 4.3.2.2.

Collectively, these power-driven dynamics can create a major source of conflict on interprofessional teams (Lidskog *et al.* 2008).

In their small qualitative study (n=16) investigating perceptions among student nurses, occupational therapists and social workers' about their own and other professions, Lidskog *et al.* (2008) argue that members from different professions, engaged in IPW on an interprofessional training ward (IPTW), attempted to reinforce their own positive 'in-group' identity, rather than yield to the development of an interprofessional identity. The concern for IPW relates to a resulting conflict, which Lidskog *et al.* (2008) believes could affect the delivery of quality patient/client care. These findings build upon earlier assertions by Mandy *et al.* (2004), who found that the podiatry and physiotherapy students in their qualitative study (n=34), used more negative adjectives to rank the 'o*ut*-group'. It also lends support to the claims by Hean *et al.* (2006a) who, in their large quantitative study involving students from 10 frontline and non-frontline professions (n=1256), recognised that the natural consequence of professional identity, that is, social categorisation and subsequent stereotyping[12], presented a major source of barriers and conflicts in IPW relationships. In a later study, Michalec *et al.* (2013) reported significant '*in-group favouritism'* (pg. 206) among first year students of medicine, nursing, pharmacy, occupational therapy, physiotherapy, and couple and family therapy (n=638). In line with SIT, the study participants clearly desired to view the group to which they aspire to in a positive light (Taifel 1971). These students also presented with a strong, positive commitment to their own professions which Michalec

[12] Professional stereotyping as a key concept underpinning the study will be considered fully in section 3.4.

et al. (2013) believed somewhat idealistic, given the early stage of student training with limited healthcare experiences.

It is clear these psychological processes, that are usually subconscious, can be potentially problematic for shared learning and collaborative teamwork. However, even more problematic is that strong professional identity produces professional boundaries and tribalism among the healthcare professions. The concept of 'tribalism' has become a metaphor symbolic of the distinctions and allegiances attributed to healthcare professional groups (Atkins 1998; Baldwin 2007; Carlisle *et al.* 2004; Reynolds 2007; Baker *et al.* 2011; Bell and Allain 2011; Timmons and East 2011). Tribalism, coupled with a sense of 'belongingness' to the traditions that represent the healthcare occupations, results in individual professions becoming territorial or protective of what they consider to be their own professional 'turf ' (Baker *et al.* 2011). These relations of power can greatly interfere with an individuals' ability to learn in a shared learning context, and are most problematic for the effective achievement of interprofessional working between healthcare professionals (Baldwin 2007; Baker *et al.* 2011). IPE aims to address these issues through increasing understanding of professional roles and boundaries, and through engendering respect for the value and expertise contributed by other professions (Thistlethwaite and Nisbet 2007). Furthermore, it is expected IPE has the potential to dismantle destructive traditional hierarchical structures embedded within the culture of healthcare delivery (Michalec et al 2013). However, power comprises a multidimensional phenomenon that can impact relationships between healthcare professionals in terms of territory, authority, status or influence (Baker *et al.* 2011) and studies suggest these power-related dynamics pose a major challenge for IPE to attain the aforementioned goals.

In their qualitative study that aimed to explore the impact of power relations on IPE (n=132), Baker *et al.* (2011) found strong professional identity had the potential to obstruct the goals of IPE through reinforcing traditional power relations among qualified healthcare professionals, instead of dissipating them. The participants appeared to protect their sense of professional identity when interacting during IPE, which in turn appeared to inhibit their ability to learn collaboratively. Baker *et al.* (2011) also observed that strong professional identity led to tension on teams when it came to interprofessional decision-making and team leadership. Physicians reinforced their traditional power status, seeing themselves as the leaders and decision-makers, whilst nurses, pharmacists, dieticians and social workers were seen as more akin to taking on a more '*holistic approach'* to care (pg.100). Some physicians viewed the longer training in their professions as justification for adopting a dominant role on the interprofessional team. Perhaps these attitudes are rooted in the uni-professional, traditional culture of physician training, which as Hall (2005) asserted, is orientated towards adoption of decision making and leadership roles.

Baker *et al'*s' (2011) study was relatively comprehensive using a reasonably large sample size for a qualitative study. However, there are limitations to which the authors refer. There is sample bias insofar as the study only used participants who volunteered. It would have been most insightful to glean the perspectives of those who declined participation. This is a frequent problem in IPE studies as participation is largely voluntary unless IPE activities happen to be part of the existing curriculum. This means that those who choose to participate potentially have a greater vested interest in IPE for some reason. Baker et al (2011) note that on the basis such a '*complex array of issues'*

emerged about the role of power in IPE, more research is needed to examine this further (pg. 103).

Baker *et al.* (2011) also asserted that rather than finding common ground between healthcare professional attitudes to each other, attitudes towards IPE can be articulated through a type of 'protectionism' whereby it becomes more important to prioritise one's own professional identity rather than find mutual goals and understandings. Perhaps, this is symptomatic of a scenario suggested by Atkins (1998), whereby healthcare professionals, having been socialised into the culture of their individual professions, experience a sense of loss and grief when they perceive that their cultural group boundaries could be under threat. A further point of interest among these findings by Baker *et al.* (2011) saw some medical staff appearing to see IPE as a potential threat to their professional status; whereas paradoxically, non-medical staff appeared to view IPE as a way to improve their status within the healthcare professions. Since higher status is generally attributed to medicine more so than any other professions (Timmons and East 2011), it could well be that non-medical participants experienced a sense of heightened status through their association of learning with the medical group.

Problems for IPW relating to tribalism and professional boundaries are recognised among HEI educators and relevant stakeholders, and it is encouraging to find there is recognition among these agents for change for IPE to combat these potentially destructive forces (Carlisle *et al.* 2004; Ryan 2010). Carlisle *et al.* (2004) used focus group interviews to glean perspectives from a combination of participants representing students, clinical and academic staff, and patient/clients (n=34), to investigate the feasibility of introducing IPE in undergraduate programmes, and to illuminate potential challenges and advantages of IPE for students, patient/client s and HEI's. Tribalism,

impermeable professional boundaries, and what was described as '*interprofessional jealousy'* among disciplines, emerged from the discussions (pg. 548). The participants viewed the establishment of IPE as a way forward for cultural change.

Similar concerns have been expressed in Ireland. In a small qualitative Irish study, Ryan (2010) explored the perspectives of leaders in healthcare education (n=8) regarding the importance of IPE development in Ireland. Tribalism and problems relating to professional boundaries again emerged within the discussions as an issue for effective IPW and a barrier to IPE. It was interesting to note the educators reported tribalism in particular among medical students, who were reported to embrace a sense of superiority over other professions. Ryan *et al.* (2010) strongly recommended early IPE to prevent stereotyping, prejudice and entrenchment of positions of superiority among students, and criticised the Irish National Healthcare Education agenda for not giving enough priority to the implementation of IPE.

3.3.5 Summary

Research investigating professional identity development among healthcare students has highlighted dilemmas for best IPE practice, hitherto producing more questions than answers as healthcare students and graduates endeavour to share their learning and work interprofessionally with powerful, underlying psychological processes relating to identity, dynamically at play. Just how secure students need to be in their professional identities before they engage effectively in learning with other professions, when best to introduce IPE, how IPE can take account of differences in identity between professions and changes over time, and how challenges posed by relations of power can be overcome, are among the presiding debates.

Social Identity Theory underscores the consequence of professional identity, that is, social categorisation with resulting production of stereotypes. Stereotyping among the healthcare professions has a strong presence in the IPE literature, and associated evidence relevant to this study will be considered in the next section.

Section 2

3.4 The significance of stereotyping among the healthcare professions for interprofessional education and working.

3.4.1 Introduction

Stereotyping by healthcare students and qualified professionals towards their own and other professions has emerged from the literature as potentially problematic for the success of shared learning and interprofessional collaboration. Stereotypes, as explained by Turner (1999), are social, categorical judgements of people in terms of their group membership[13]. As previously noted in section 3.3.4, stereotypes are essentially a product of social categorisation brought about by the development of an identity among individuals with their own group. According to Haslam *et al.* (2002), it is part of the human condition to form stereotypes and so is a natural and normal phenomenon. However, stereotypes are inherently destructive by nature. In the context of IPW aiming to provide safe quality patient/client care, negative stereotyping can be a major source of tension and conflict between healthcare professions, with resulting poor communication and work dissatisfaction (Carpenter 1995a; Ryan and McKenna 1994; Haslam *et al.* 2002; Michalec *et al.* 2013). These negative perceptions are often enacted in the context of skills, abilities, and the clinical and academic knowledge credited to the healthcare professions (Barnes *et al.* 2000; Ateah *et al.* 2011; Michalec *et al.* 2013).

The literature investigating stereotyping among undergraduate healthcare students can be broadly divided into two main categories; studies that have explored the existence

[13] The nature of stereotypes in the context of social psychology theory is discussed further in chapter 4 section 4.3.1.

and nature of stereotypes without IPE intervention, often with the intention of providing an evidence base for IPE as well as to illuminate and understand stereotyping among professions (Parker and Chan 1986; Streed and Stoecker 1991; Kamps *et al.* 1996; Katz *et al.* 2001; Hind *et al.* 2003; Rutland and mires 2005; Hean *et al.* 2006a; Michalec et al 2013); and studies that have used an IPE intervention to investigate the impact of IPE on stereotyped attitudes (Carpenter 1995a; Lindqvist *et al.* 2005a; Jacobsen and Lindqvist 2009; Ateah et al 2011; Hawkes *et al.* 2013; Foster and Macleod Clark 2015). The latter body of evidence can be further subdivided into those that show positive effects, negative effects, and mixed positive and negative effects of IPE on stereotyped attitudes.

3.4.2 The emergence of stereotyped profiles among the healthcare professions.

Stereotyping between healthcare students and qualified healthcare professionals, has a long standing history in the IPE and IPW literature. Among the earliest of the non-intervention designs comprised studies by Parker and Chan (1986), Streed and Stoecker (1991) and Kamps *et al.* (1996). Using the Health Team Stereotyping Scale (HTSS) originally developed in 1957 by Osgood and colleagues, these studies identified the existence of stereotypes and strong in-group favouritism (Turner 1999) between qualified physiotherapists and occupational therapists (Parker and Chan 1986, n=106), and between students of physiotherapy and occupational therapy (Streed and Stoecker 1991, n=84; Kamps *et al.* 1996, n=744). Considering the findings of their study together with those of Parker and Chan (1986) which revealed existence of the same stereotypes in a sample of qualified professionals, Streed and Stoecker (1991) concluded that stereotypes among undergraduate students appear likely to be carried into professional practice after graduation. Other early studies using the Health Care

Stereotypes Scale (HCSS) developed by Carpenter (1995a), found similar stereotyping patterns among nursing and medical students (Carpenter 1995a; Rudland and Mires 2005).

These aforementioned studies, albeit with limited sample representation of frontline healthcare professions, and some with relatively small sample sizes, highlighted the existence of negative stereotyping among students during the academic programmes and the subsequent challenges for the pursuit of effective collaborative teamwork. Building on this early evidence, further IPE non-intervention studies saw representation of more frontline healthcare professions in their samples, larger sample sizes, longitudinal designs, and the development of new validated and reliable measures such as the widely used Student Stereotype Rating Scale (SSRQ) (Barnes *et al.* 2000; Hean *et al.* 2006a). These studies built upon the early evidence, reinforcing the need for IPE implementation to address stereotyping in the undergraduate years.

Hean *et al.* (2006a) investigated if students entered their courses with preconceived ideas of other disciplines and if these students perceived professional characteristics to be different between the professions. Their large pioneering study[14] involved ten professional disciplines including undergraduate students of nursing, medicine audiology, midwifery, occupational therapy, pharmacy, physiotherapy, podiatry, radiography and social work (n=1256). Using the Student Stereotype Rating Scale (SSRQ), a revised version of the scale originally developed by Barnes *et al.* (2000), students rated the professions on nine characteristics; academic ability, interpersonal skills, ability to be a team player, leadership ability, ability to work independently,

[14] Hean *et al.* (2006a) present baseline data as part of a longitudinal study (Foster and Macleod Clark (2015) which is further considered in section 3.4.3.

decision-making ability, professional competence, practical skills, and confidence. Differentiation between the professions was very evident, particularly on the characteristics of interpersonal skills, academic ability and ability to be a team player. There was, however, less differentiation between the professions on the characteristics of professional competence and confidence.

Stereotype profiles emerged in this study clearly representing how these students viewed their colleagues from the different professions on professional characteristics. Nurses were generally credited with good interpersonal skills and ability to be a team player, whereas doctors and pharmacists were seen to have higher academic ability but poorer interpersonal skills and team player ability. Doctors were also seen to have much higher decision-making ability and greater leadership skills than their other healthcare groups. Generally all professions were rated highly on confidence and professional competence. This study resonates with similar findings by Hind *et al.* (2003), who found nurses were perceived to have stronger interpersonal skills and team player ability, whereas doctors and pharmacists were rated lower on these attributes. Rudland and Miers (2005) in their study involving first, second, third and fourth year medical students found that medical students considered doctors to be more arrogant and nurses to be more caring, and viewed nurses as having lower academic ability, competence, and status.

Whilst Hean *et al.'s* (2006a) study used a large student sample and a well validated measure, they selected four professions randomly out of ten to rate the other disciplines. Hence the ratings of all professions are not known. Furthermore, the ratings on each attribute were not a breakdown of ratings attributed by each profession. Noting this limitation, Michalec *et al.* (2013) took their analysis a stage further to '*fully dissect'* the

stereotyped attitudes (pg. 206). All professions were required to rate the other on the SSRQ attributes, and how each profession individually rated all other professions was reported[15]. In their sample of first year students of medicine, nursing, pharmacy, occupational therapy, physiotherapy, and couple and family therapy (n=638), the rating trend saw each profession rate their own the highest on nearly all characteristics, with the exception of the medical group. This clearly demonstrated positive differentiation and in-group favouritism by five out of six professions thus lending robust support for the tenets of SIT (Tajfel *et al.* 1971; Turner 1999).

With similar findings to Hean *et al.* (2006a), the nursing group received highest rating for team player and practical skills and lowest ratings for leadership ability. It was paradoxical that whilst nurses were viewed as very central to the team, they were not considered well positioned to lead the team. They were not alone in low ratings on this attribute with occupational therapy, physiotherapy and most notably pharmacy, also receiving low ratings for leadership. Congruent also with Hean *et al.* (2006a), the medical and pharmacy students both received relatively low ratings on the interpersonal skills and team player attributes, and received highest for academic ability. A finding of particular interest emerged in this study whereby the medical students rated their own profession lower on all attributes except leadership ability, while all the other professions rated medicine the highest on seven out of the nine attributes (academic ability, professional competence, leadership, work independently, make decisions, practical skills, and confidence). This represents an unusual finding by comparison to other studies. Michalec *et al.* (2013) interpreted these attitudes among the medical

[15] For example: the high ratings obtained for medicine and pharmacy on the attribute of academic ability were examined to see which professions actually attributed the rating.

students as either representative of '*a socially desirable veil of Humility'* (pg. 212), or a feeling of overwhelm among the neophyte student group, as opposed to a true reflection of beliefs about the ability of their profession. Although Michalec *et al.* (2013) produced a comprehensive study of stereotypes among six healthcare professions by comparison to earlier studies; the authors recognise a number of limitations insofar as only one Higher Education Institution was used, thus reducing generalizability of the findings. Sample sizes by discipline also varied considerably, with couple and family therapy as low as nine participants. Collectively these limitations reduce the generalizability of the results.

Taken together, the findings from these aforementioned studies clearly depict the presence of stereotypes among the attitudes of undergraduate students from a wide variety of disciplines in healthcare education. The underlying premise of SIT (Tajfel 1978; Tajfel 1981) purports that group members favour the participants in their own 'in-group' over the other 'out -group', and, parallel to this theory, these studies highlighted a natural tendency among healthcare students to rate their own professions higher than others. The ratings attributed to professions on certain characteristics by other professions, are remarkably similar and observable across studies.

A key learning outcome for IPE involves changing negative attitudes between the healthcare professions (Barr *et al.* 2005). With a wealth of literature demonstrating that healthcare students enter their respective courses with pre-defined stereotypes (Tunstall-Pedoe *et al.* 2003; Cooke *et al.* 2003; Hind *et al.* 2003; Mandy *et al.* 2004; Rutland and Mires 2005; Lindqvist *et al.* 2005a; Hean *et al.* 2006b; Ajjawi *et al.* 2009; Bradley *et al.* 2009; Hansson *et al.* 2010; Ateah *et al.* 2011; Michalec *et al.* 2013; Hawke *et al.* 2013; Cook and Stoecker 2014; Foster and Macleod Clark 2015), it is clear IPE has potentially

an essential role, but a challenging one, in the moderating of negative attitudes at undergraduate level, to prevent their potentially disabling effect on IPW after graduates enter the workforce.

3.4.3 Impact of interprofessional education on professional stereotyping.

Studies investigating the impact of IPE on stereotypes and attitudes comprise mixed reports, with some studies showing positive effects from IPE, others yielding more negatively orientated outcomes, and some reporting mixed results. In proportion to the immense body of literature available, there is overall a dearth of robust empirical evidence to demonstrate how IPE in reality actually impacts on attitudes and stereotyped views. The systematic review by Reeves *et al.* (2016), which aimed to investigate the effectiveness of IPE on knowledge, skills and attitudes of the learner, changes to organisational practice, and benefits to patient/clients, identified 25 studies considered of methodological quality to add to an original 21 studies selected for inclusion in the previous review by Hammick and colleagues in 2007. This review revealed that the body of robust evidence is growing to indicate that IPE is having an overall positive impact on learners' attitudes (Reeves *et al.* 2016).

The earliest study to report positive effects of an IPE experience sourced for the current study dated as far back as 1972, whereby Bernardi found greater role understanding between podiatrists and pharmacists after this style of education. Over twenty years later, Davidson and Lucas (1995) observed that perceptions had positively changed among the views of undergraduate physiotherapy, radiography, occupational therapy, and podiatry students after IPE, albeit the researchers could not ascertain for certain whether the positive changes were a result of the interprofessional approach, or the actual education component. Later, Katz *et al.* (2001) examined stereotypes among

physiotherapy and occupational therapy students (n=53) and found that students who had experienced IPE indicated more positive views towards each other than those who did not participate in IPE.

Among the most noteworthy and robust of these IPE intervention studies was the New Generation Project Longitudinal Study (NGPLS) conducted in the U.K. by Foster and Macleod Clark (2015). Building on the aforementioned baseline data reported by Hean *et al.* (2006a), this pioneering study investigated the impact of an IPE programme, on stereotypes among two cohorts of healthcare and social care students from two adjacent universities. Using a pre-test, post-test quasi-experimental design, they compared students who experienced IPE and those who did not. The sample comprised a comparison group (n=672) of students from medicine, midwifery, nursing, occupational therapy, pharmacy, physiotherapy, podiatry, radiography and social work. The intervention group (n=580) included all of the aforementioned disciplines with an additional cohort of audiology students. The SSRQ was completed at Time 1 during the first term of first year, and again at Time 2, during last term of their final year of study.

Bearing much similarity in terms of stereotyped profiles to studies by Hind *et al.* (2003), Rudland and Miers (2005), Michalec *et al.* (2013) and augmenting the baseline findings by Hean *et al.* (2006a), Foster and Macleod Clark (2015) reported stereotype profiles that saw nurses, midwives and social workers consistently credited with highest ratings for interpersonal skills in both cohorts at both timepoints, while pharmacists and doctors received the lowest ratings on this attribute. The highest rating for academic ability was awarded to pharmacists and doctors, while nurses and social workers received the lowest ratings on this attribute. By the end of their academic programmes, both intervention and comparator groups still rated the professions differently, with

little difference in the patterns of ratings for each profession. The robust longitudinal method utilised in this study yielded findings which spotlight the resilience of stereotypes, and lend support to the original assertion by Streed and Stoecker (1991) that stereotypes among undergraduate students are likely to be carried into professional practice after graduation.

Importantly, Foster and Macleod Clarke (2015) contended that the IPE intervention had a role in moderating stereotypes, as evidenced by more decreases in ratings of the professional characteristics over time in the intervention group, than observed in the comparator group. On the surface this findings could be construed as a negative outcome of IPE. However, the authors interpreted this finding positively, believing the IPE to engender more realistic student beliefs about the abilities of the professions. They speculated that increased realism could potentially result in better team working if students attained more realistic perceptions of the abilities and characteristics of their team members. More studies are required to follow up results like these to see if such changes through IPE actually materialise into more effective IPW.

Also using the SSRQ, the findings from the earlier study by Ateah *et al.* (2011) bear similarities to those reported by Foster and Macleod Clarke (2015) in terms of stereotype profiles, but differ in terms of impact of IPE on attitudes. Their longitudinal study that used a modified experimental pre-test, post-test design, examined the impact of a two and half day IPE intervention on stereotyped attitudes over a period of 4-5 months. Data was also collected at four time points from students of dentistry, medicine, nursing, occupational therapy, physiotherapy, pharmacy, medical rehabilitation and dental Hygiene (n= 51) from a single university. The sample was divided into three groups engaged in either clinical IPE, academic IPE, or assigned to a

comparator group with no intervention. As before, the commonly assigned stereotype profiles were evident, and strongly resonated with the studies aforementioned. Doctors, pharmacists and dentists received low ratings on the on interpersonal skills attribute while nurses were rated highly. Doctors received highest for leadership than any other profession, while nurses and occupational therapist and physiotherapist received the lowest. Nurses were rated second lowest after the dental hygiene group on academic ability, but it must be noted that this rating still amounted to a score in the high range. Nursing also received better ratings for decision-making than seen in aforementioned studies, falling in the medium score range.

In line with CAIPE objectives (2007), this IPE intervention was effective, with Ateah *et al.* (2011) affirming that the students learned 'with, from and about' each other (pg. 19). Along with the IPE experiences provided from the clinical learning environments, a brief classroom-based IPE intervention brought about significant positive moderations to the students' perceptions of other professions. Unlike the findings reported by Foster and Macleod Clark (2015), there were no decreases in ratings of the attributes credited to the professions following the IPE intervention, meaning the intervention appeared to have more influence on improving negative stereotypes. The most noteworthy changes occurred among the nursing profession, who were rated higher on academic ability, leadership, independent working, and decision-making after IPE. There were no significant increases for the nursing group on interpersonal skills after what was an already high rating at baseline. These findings point to a positive outlook for the laudable goals of IPE to engender better teamwork between the professions

Prior to the adaptation of the original SSRQ (Barnes *et al.* 2000) by Hean and colleagues (2006a and 2006b), some studies used the Attitudes to Health Professionals

Questionnaire (AHPQ), which is also recognised to identify the presence of stereotyped views as well as detect changes to attitudes brought about by education (Lindqvist *et al.* 2005b). However, by comparison to the SSRQ, this scale appears less comprehensive in terms of the professional attributes included on the scale. With that said, it yielded insights into how a case-based learning style IPE intervention impacted stereotypes among a sample of medicine, nursing, occupational therapy, physiotherapy and midwifery students in the study by Lindqvist *et al.* (2005a). Attitudes were compared for IPE impact between a control group (n=50) and an intervention group (n=46) at two timepoints. 'Caring' and 'subservience' were the main dimensions identified among the attitudes. This study reported some impact of IPE upon attitude change as all five professions were viewed as more caring after the intervention and occupational therapists were viewed as less subservient after IPE, and as more subservient by the non-intervention group. However, nurses were viewed as the most caring profession, while doctors were viewed the least, and nurses were also viewed as the most subservient and doctors were viewed as the least. Perhaps the IPE was slow to affect change, in what could possibly be more resistant attitudes originating from traditional beliefs about nurses and doctors.

A further study of note investigated if IPE could have the potential to improve management of patient/client medication through improving teamwork between different professions. Hawkes *et al.* (2013) also used the AHPQ (Lindqvist *et al.* 2005b), before and after a seven week medication management IPE intervention involving first year nursing, pharmacy and medical students (n= 186). Congruent with aforementioned studies, results showed that their sample of first year students entered with stereotyped views about the healthcare professions and stereotype profiles again

emerged. Nurses were viewed as the most caring profession, while nursing and pharmacy students perceived doctors to be the least caring profession both pre and post IPE. The medical students rated the pharmacists as the least caring profession. In keeping with principles of SIT that relates to in-group favouritism (Turner 1999), students rated their own profession as more caring than did others. However, after the IPE experience, pharmacists, doctors and nurses all received higher ratings for caring, indicating that the IPE had some moderating effect on the pre-intervention attitudes, leading Hawkes *et al.* (2013) to conclude that IPE could potentially have some benefit for addressing medication management issues through improved IPW between these key healthcare professionals. This is a most optimistic finding given the recent concerns articulated in the international and Irish literature and government documents associating collaborative failure and communication difficulties, with medication errors, polypharmacy and lack of information about side effects of medications (Bretherton *et al.* 2003; Dornan *et al.* 2009; Gallagher and Gallaher 2012; Ryan *et al.* 2014; WHO 2017; HSE 2017a; Elliot *et al.* 2018).

Some studies, the majority of which will be considered in the third section of this chapter, used other scales to explore attitudes such as the well validated Readiness for Interprofessional Learning Scale (RIPLS) (Parsell and Bligh 1999). However, it is worth considering the results reported by Bradley *et al.* (2009) in this section, as study findings detected stereotyped views among interviews with participants. Bradley *et al.* (2009) used a longitudinal, mixed methods quasi-experimental design to investigate the effect of a one hour resuscitation skills session on attitudes, team working, leadership and performance among second year medical and nursing students (n=215). Quantitative data was collected before and after IPE, and 3-4 months later. Focus group

interviews were used to corroborate the quantitative data three to four months after the interventions. Students were assigned to uni-professional or interprofessional groups. Students showed interest and support for the concept of shared learning as observed among the high RIPLS scores, with the IPE group more willing to learn together than the uni-professional group. Stereotyped attitudes were revealed from the qualitative data, whereby nurses viewed the doctors' role as primarily one of leadership. Bradley *et al.'s* (2009) study added a further element of interest to the existing studies reporting positive attitudes from IPE. However, although the IPE group appeared more willing to learn together after IPE, this positive effect appeared short-lived and declined after a period of three to four months, thus indicating that the effects of IPE were transitory. They did note that the IPE group retained more positivity for shared learning than the uni-professional group which spotlights that IPE can in itself increase willingness for shared learning experiences.

It could be argued that whilst this mixed method study used the well validated RIPLS as a quantitative measure to glean the attitudes of the students towards the concept of IPE it may not be the best instrument to corroborate the qualitative data, as the RIPLS was not designed to measure stereotypes as such. The substitution or the addition of a validated measure such as the Student Stereotype Rating Scale (SSRQ) (Hean *et al.* 2006a), may have been more appropriate to corroborate the qualitative data and strengthen the argument that feelings expressed by study participants were based on stereotyped views. Furthermore, the suitability of the RIPLS as a before and after measurement tool, has since been called into question, with Mahler *et al.* (2015) arguing this scale has incorrectly been adopted for use in before and after intervention studies

for which it was not originally intended and the study findings need to be viewed in that light.

Further limitations to which the authors refer, relate to the use of a relatively small sample, that the IPE intervention was limited to one day, and the potential of recall bias as the interviews were conducted a period of time after (3-4 months) the IPE. Nonetheless, this study through its use of mixed methods and quasi-experimental design represents one of the more robust of its type, with the authors asserting that the qualitative component augmented their understanding of the impact of IPE on attitudes.

Whilst the majority of the aforementioned studies report positive effects of IPE on students' attitudes, there is also disconcerting evidence to suggest that IPE has potential to reinforce instead of dissipate negative stereotypes, produce new negative attitudes, or bring about deterioration in what were originally positive attitudes prior to an IPE experience (Carpenter 1995; Tunstall-Pedoe *et al.* 2003; Mandy *et al.* 2004; Nisbet *et al.* 2008; Foster and Macleod Clark 2015; Stull and Blue 2016).

Carpenter (1995a) reported that whilst the short term interprofessional programme improved misconceptions about the roles of doctors and nurses, it did not significantly change stereotyped attitudes among the nursing and medical students. Although the participants in the longitudinal study by Tunstall-Pedoe *et al.* (2003) had generally positive views towards IPE, their findings revealed that the negative stereotypes among their sample (n=232) of medical, nursing, physiotherapy and radiography students, appeared to become more exaggerated after a problem based learning IPE intervention taking place in the first semester. As with Carpenter (1995a), data was collected using the Health Care Stereotypes Scale (HCSS) (Carpenter, 1995a), before the start and at the end of the term for two consecutive years. Similar stereotype profiles reported in

the aforementioned studies were revealed, with the medical group seen as less communicative, have less ability to be a team player, and credited with having the highest academic ability. However, despite sustained positive views over time among the non-medical student groups, the medical group retained their lower ratings of the other professions (Tunstall-Pedoe *et al.* 2003). It must be noted, however, that this study gives a somewhat limited analysis of the attitudes, because nurses, radiographers and physiotherapists were collectively rated under the umbrella term 'nursing and allied healthcare professionals'. If these groups were rated separately by discipline, a more accurate and complete picture of stereotype ratings could be obtained.

Mandy *et al.* (2004) reported similar findings to Tunstall-Pedoe *et al.* (2003), in their longitudinal study using the Health Team Stereotype Scale (HTSS) (Osgood *et al.* 1957). The sample included undergraduate physiotherapy and podiatry students (n=130), and data was collected before and after an early IPE semester involving research methods and professional studies modules. This IPE intervention appeared to reinforce negative perceptions among the physiotherapy group, with no significant change in the podiatry group. A distinguishing feature that gives strength to this study saw the exclusion of students who had either prior learning on a healthcare course or who had previous healthcare experience before commencing the course. On that basis, it could be said with more confidence that these stereotyped views were formulated independently of these influences, and most likely had their origin in societal beliefs and alternative pre-course experiences.

In a small mixed methods study, Nisbet *et al.* (2008) reported the retention of negative stereotypes after their IPE programme. The voluntary participants including senior year students of dietetics, medicine, nursing, occupational therapy and physiotherapy (n=41),

maintained their negatively constructed stereotypes about certain professions after clinical IPE, albeit the experience had potential to improve understanding of roles. Attitudes towards doctors were seen to be particularly negative, with some students feeling intimidated by doctors. These negative emotions had an impact on group dynamics and caused much communicative restraint among the groups. On a positive note, however, the study reported enhanced understanding of the roles of other team members and a positive view in general towards IPW. More recently, using the Interdisciplinary Education Perception Scale (IEPS) (Luecht *et al.* 1990), Stull and Blue (2016) (previously discussed in relation to professional identity, section 3.3.2), reported deteriorating attitudes by first year students towards their own and other professions after a one semester long compulsory interprofessional course.

The collective message among these conflicting findings is that some doubt is raised about the design and /or structure of some IPE interventions/programmes, and these studies point to a need for further research to ascertain the most effective types of IPE to moderate professional stereotypes. When compiling this data, the variations of IPE intervention, methods of evaluation and multitude of contextual factors, made it very difficult to draw generalised conclusions or comparisons across studies. Furthermore, owing to wide variations of participating professions, number of participating institutions, diverse sample sizes, and varying study methods with use of different measures, it is difficult to ascertain which design or 'type' of IPE is best placed to moderate negative stereotypes.

However, determining which IPE designs impact stereotypes was not an objective of this study, and beyond the scope of this literature review. Having said that, three design issues stood out among the debates, which could be critical to maximising best IPE

outcomes, that is, clinical and classroom based IPE, voluntary versus involuntary IPE, and informal interprofessional education. These will be briefly considered next.[16]

3.4.4 Clinical and classroom based interprofessional education

The argument as to whether IPE is best provided in the classroom or clinical setting has somewhat resolved over time, with many IPE champions now believing both to be essential, and Higher Education Institutions endeavouring to provide clinical IPE opportunities (Reeves *et al.* 2016). Amidst the negative findings mentioned above, Nisbet *et al.* (2008) contended that real clinical experiences on a ward, not only encouraged teamwork and collaboration among undergraduate students, but also improved their confidence to work interprofessionally. In an attempt to provide more realistic settings, Higher Education Institutions are increasingly developing interprofessional training wards with affiliated hospitals, to better facilitate interprofessional interaction between healthcare students during clinical IPE[17]. In an innovative move the first of this type was developed in 1996 in the University Hospital of Linkoping, Sweden. This form of IPE has since shown promise, featuring in the literature as a very real and positive way to improve IPW skills and attitudes among students.

In their study that evaluated an interprofessional training ward (London Training Ward), Reeves and Freeth (2002), reported general satisfaction and success among students and staff but also among patient/client. In their mixed methods study, Morison *et al.* (2003)

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[16] These design issues are given some consideration because they particularly resonate with the challenges for IPE implementation encountered by our institution. They also resonated with occasional qualitative comments by the participants in this study.

[17] In conjunction with an affiliated Irish hospital, our university has recently developed an interprofessional training ward to facilitate clinical IPE placements for third year healthcare students.

reported positive results among their sample of third year nursing and fourth year medical students (n=96), asserting then that classroom based IPE marked a useful beginning for IPE in the early stages of student training. However, it was clinical IPE that emerged as the method of preference among these groups, because students started to feel like they belonged to a team, learned about the roles and responsibilities of each profession, and increased their understanding of IPW. Likewise, Jacobsen and Lindqvist (2009) reported enhanced positivity among the views of occupational therapy, physiotherapy, medicine and nursing (n=162) students, following a two week experience in an interprofessional training ward. The experiences engendered more positive changes in students' stereotyped views, and as in the study by Morison *et al.* (2003), resulted in enhanced understanding of the professional roles of other disciplines. These positive findings are most encouraging, particularly when students, given a choice, indicated a preference for clinical based over classroom based IPE (Morison *et al.* (2003). This bodes well for institutions constrained by silos, shortage of common classroom spaces and conflicting schedules and perhaps the interprofessional training ward poses the solution (Flemming and Lindqvist 2009). An outstanding finding among this evidence relates to patient/clients reporting satisfaction with the care they received from students learning together on the interprofessional training ward (Reeves and Freeth 2002). This represents a critical insight for developers of clinical IPE, and gives reassurance for concerns about the welfare of patient/client recipients of care.

3.4.5 Voluntary versus involuntary interprofessional education.

Another possible explanation of why some IPE does not yield positive outcomes in terms of changing negative attitudes, could relate to whether or not participation is on a

voluntary or involuntary basis[18]. There is still much debate in the literature with a dearth of evidence and on-going debate as to which approach will yield most successful IPE outcomes. Whilst the IPE approach will be determined by course content and curricular aims, consideration also needs to be given as to which type of IPE will moderate negative stereotypes. Nisbet *et al.* (2008) reported that their voluntary IPE programme failed to completely address negative stereotypes. But then again, involuntary IPE led to deterioration of attitudes in the study by Stull and Blue (2016). Students who volunteer are potentially more likely to be enthused about this form of learning (Watts *et al.* 2007; Hollenberg *et al.* 2009; Byrnes *et al.* 2012). However, whilst this may seem helpful in terms of yielding positive IPE outcomes among an existing group of enthusiastic students, questions must be asked about students who, for whatever reason, self-exclude from IPE, and are these the students most likely to retain negative attitudes to IPE and ultimately IPW? It seems logical that if IPE is to successfully achieve its broad aim of improved collaborative working on a grand scale, all undergraduate students need to participate in IPE for teamwork to ultimately be effective and engender the '*collaborative ready workforce*' required for our modern day healthcare systems (WHO 2010). A further point of interest is that voluntary IPE emerged as a potential bias among studies in this literature review, on the basis that students who desire to take part may be more likely to view IPE positively.

3.4.6 Facilitation of informal interprofessional education

Informal IPE relates to the learning about the roles and characteristics of other healthcare professions that takes place through natural interaction with or without

[18] Our institution currently involves voluntary IPE for some healthcare disciplines and involuntary IPE for others.

structured IPE intervention. Informal IPE can be beneficial in engendering positivity to improve interprofessional relationships (Freeth *et al.* 2005), and can result in greater appreciation for other groups (Mu *et al.* 2004). It is very much in line with the Contact Hypothesis (Allport 1979; Hewstone and Brown 1986) which suggests that contact occurring in a natural way outside the classroom, could influence the development of positive interprofessional attitudes among students across disciplines.

However, there are mixed reports about how students avail of contact. Mandy *et al.* (2004) reported that despite 25% of the student cohort engaged in social activities with each other outside the academic environment, negative perceptions still prevailed among the disciplines. Coster *et al.* (2008) observed there was a lack of informal contact reported among their student disciplines, even during their IPE intervention. Other studies supported the facilitation of informal IPE opportunities, arguing that the informal IPE experiences brought about by shared journeys (Mu *et al.* 2004), refreshment breaks (Morison *et al.* 2003), and generally socialising with other disciplines (Reeves 2000) appear to be beneficial.

Possibly the greatest difficulty for IPE developers, hoping to facilitate informal IPE experiences, relates to the 'siloed' approach to healthcare education, whereby schools and faculties often consist of separate buildings, rendering students with little potential for contact with each other[19] (Gilbert 2005b). In recognition of the potential value of informal IPE, some institutions are endeavouring to address this issue by accommodating different healthcare professions to socialise in common areas (Coster *et al.* 2008).

[19] Just one healthcare discipline is on the main campus in this university. Other disciplines are separated in locations around the City. At the time of data completion in 2012, physiotherapy and occupational therapy shared a building on the affiliated hospital campus. Dietetics since joined these groups.

Whilst barriers that form concrete walls and separate buildings and physically separate the professions, possibly the greatest barrier is metaphorical in that professions have a tendency to maintain their boundaries (Baldwin 2007; Baker *et al.* 2011). Professional stereotyping has the potential to generate, but also to maintain professional boundaries, and learning in silos could only serve to perpetuate the divide through insular and self-protective attitudes (Gilbert 2005b). An associated and contentious issue potentially impacting on effectiveness of IPE and problematic for IPW echoes among the studies reviewed up to this point. This relates to the stereotyped hierarchies and perceptions of status inequality among the healthcare professions, and these issues will be considered in the ensuing section.

3.4.7 The impact of stereotyped hierarchies and status inequality for interprofessional education.

These issues have been already deliberated in the context of professional identity and power relations in section 3.3.4. However, they emerged strongly in relation to stereotyping and warrant further consideration at his juncture. Negative stereotyping among students can emanate from imbalances in perceptions about professions that relate to status and hierarchy (Bradley *et al.* 2009). Stereotyped beliefs are partly shaped by societal influences that students bring to their courses, as evidenced among the studies presented in section 3.4.3. Lending support to the claims by Hall (2005), Baldwin (2007) and Ryan (2010), studies have intimated that stereotyped hierarchies and perceived status inequality between the healthcare professions, in particular regarding the nursing and medical professions, are powerful forces impacting IPE, and can cause communication difficulties between professions. Takase *et al.* (2001) contended that stereotypes played a part in the low collective esteem and job

satisfaction for some healthcare professions, one of which is nursing. Furthermore, stereotypes which view nurses as subservient to other professionals, as well as the belief that this profession functions to provide support for doctors, has perpetuated inequality of status and prestige for this profession (Kulys and Davis, 1987; Hall 2005; Baldwin 2007). Perhaps, as argued by Baldwin *et al.* (1983), governments and legislation have, possibly inadvertently, abetted the development of stereotyped beliefs in society about the healthcare professions. Baldwin *et al.* (1983) argued that legislation governing the obligations and roles of a professional group could have resulted in the development of healthcare profession-related stereotypes. A clear example of this can be seen relating to the pharmacy profession. Pharmacists have traditionally been restricted from discussing therapies with patient/clients, a situation which may have resulted in the stereotype, and well evidenced perception among students and in society, that this profession collectively has poorer interpersonal skills than their healthcare counterparts.

Studies have indicated that views such as those expressed above, are potentially problematic for IPE and IPW. In their robust qualitative study that used triangulation in the form of qualitative questionnaires, focus group interviews and observational field notes to explore the effect on attitudes of an IPE intervention involving breaking bad news to patient/clients (Cooke *et al.* 2003), medical students who previously participated in an IPE course were more reluctant to participate afterwards, and expressed the desire to maintain '*professional distance'* (pg. 142). Attitudes connected to stereotypical hierarchies were argued to be an issue. This is a matter of concern given the sensitivity of the IPE subject content, and questions would have to be asked as to whether these students prioritised their professional boundaries ahead of the importance of dealing with this subject matter. On a similar vein as mentioned

previously, Lindqvist *et al.* (2005a) reported that nurses were viewed as the most caring profession, but were also seen as subservient to doctors.

In support of earlier evidence, Nisbet *et al.* (2008) found that doctors were seen by many students as having higher status and, as noted in aforementioned studies, were seen as the profession with the primary leadership roles and decision-making ability. Ajjawi *et al.* (2009) and Hansson *et al.* (2010) concurred in a similar way to Nisbet *et al.* (2008), also reporting negativity about medical students in particular, whereby groups experienced negative 'vibes' from medical students. After a shared learning programme for medical and dental students, Ajjawi *et al.* (2009) found that dental students felt stereotyped and marginalised by medical students. Hansson *et al.* (2010), found no improvement after IPE among the attitudes from medical students towards the nursing profession, or on negative views they expressed about working collaboratively with nurses. As previously aforementioned, the educators in the study by Ryan (2010) observed difficulties among medical students during an IPE intervention, reporting that these students appeared to experience an erosion of what they considered their territory by the other students.

IPE seemed to be counterproductive in achieving its aims in the study by Baker *et al.* (2011), who reported a sense of supremacy about the profession of medicine evident among the qualified professionals, with IPE appearing to engender competition instead of collaboration between the participants. Furthermore, the views held towards interprofessional interaction, and attitudes and behaviour during IPE, had a tendency to reinforce traditional power relationships rather than dissipate them. As previously noted in relation to the discussion on professional identity, Baker *et al.* (2011) claimed that the non-medical professionals appeared to view IPE as an opportunity to enhance

their status. However, these views are not just unique to healthcare professions. Using the SSRQ (Hean *et al.* 2006a), Bell and Allain (2011) found that during the course of discussing the concept of professional stereotyping, their small mixed sample of undergraduate and postgraduate social work student participants (n=32) stood by their beliefs about status and hierarchy between healthcare professions, particularly as they pertained to the medical profession. On an optimistic note, the discussions had benefit insofar as they promoted critical reflection about roles and responsibilities of different profession.

Equality emerged within the literature as a potentially contentious issue for the success of IPE. Parsell and Bligh (1998) claimed, for IPE to be effective, students will need to feel regarded as equals. When considered though the lens of the Contact Hypothesis (Allport 1954 and 1979; Hewstone and Brown 1986), inequality becomes a matter of concern for the pursuit of effective interactions between healthcare professions during IPE and IPW. The Contact Hypothesis posits that attitudes can be moderated when groups are brought together if certain conditions are met, one of which is equality (Hewstone and Brown, 1986) (Appendix 6). Tunstall-Pedoe *et al.* (2003) contended that the participants in their study did not positively change their negative attitudes because the condition of equality was not met in line with the Contact Hypothesis.

Perhaps the condition equality as depicted by the Contact Hypothesis helps to explain why some students voice reluctance to learn with other professions, and report feelings of inadequacy or fear about the prospect of learning with colleagues from other professions. Stereotyped hierarchies and perceptions of status inequality, are so potentially damaging they can result in students becoming less willing, and/or less confidence to share their learning with professional groups perceived to have higher

academic ability or status (Watts *et al.* 2007; Nisbet *et al.* 2008; Anderson and Thorpe 2008; Pollard and Miers 2008; Bradley *et al.* 2009). Hean *et al.* (2006a) argued that if students sharing their learning together believe that they are being judged in accordance with a stereotype, it could impact on their confidence, self-image and even their productivity within the group. Many of the nursing and medical students (n=113) in the study by Tucker *et al.* (2003), experienced a sense of '*fear of failure'* and worried about appearing less competent while learning with students from other disciplines (pg. 633). On a similar vein, Anderson and Thorpe (2008) reported nurses and midwives felt academically inferior when sharing their learning with medical students. With that said midwifery and pharmacy students felt that the shared learning helped break down some traditional stereotypes, namely relating to the existence of perceptions that doctors were arrogant. Bradley *et al.* (2009) reported that the nursing students in their uni-professional group, expressed concerns and feelings of intimidation at the prospect of learning with medical students. In line with the arguments by Hall (2005), Baldwin *et al.* (2007) and Baker *et al.* (2011), Bradley *et al.* (2009) attributed this negativity to existing '*cultural norms'* (pg. 920) and issues relating to negative perceptions about hierarchy and high status traditionally attributed to the medical profession.

The evidence indicates that attitudes originating from traditional stereotyped hierarchies and perceived status inequality between the healthcare professions appear to potentially impinge upon the effectiveness of IPE to change negative stereotypes. It is quite conceivable that IPE can be predominantly hampered by such attitudes, rather than the IPE design itself. Stereotypes among the healthcare professionals appear to be derived from popular discourse, are frequently devoid of logic, and are not necessarily symbolic of a given profession or of the individuals that represent it. Yet, they have the

propensity to bring about negative or false expectations of attitudes or behaviours of other healthcare groups (Hean *et al.* 2006a; Anderson and Thorpe 2008). Social psychology theory suggests that negative expectations of a group have the potential to create a reality, and this reality can become a self-fulfilling prophecy whereby professionals may well exercise the expected behaviour, thus perpetuating and reinforcing the stereotype (Merton 1948; Hilton and Von Hippel, 1996). For example, the belief that doctors and pharmacists have poor interpersonal skills, could quite easily affect how other professional groups interact with this discipline, and likewise, the belief that nurses and dieticians are less academically capable than other professionals, could perpetuate traditional notions of subservience such as the belief that the nurse serves as a handmaiden to the doctor (Kulys and Davis 1987; Carpenter 1995a; Hall 2005; Baldwin 2007; Baker *et al.* 2011).

The resilience and resistance of professional stereotypes to change, is evident in both IPE intervention and non-intervention studies aforementioned. Whether they are real or imagined, perceived differences in abilities among healthcare students pose a major concern for IPE. On an optimistic note, there is great potential for IPE to ultimately impact quality of patient/client care, if the positive changes observed among these studies translate into enhanced IPW after graduation.

3.4.8 Summary

These studies reflect the stereotyped attitudes with which undergraduate healthcare students entered their courses and underscore a strong commitment to their own professions from the outset. Stereotyped profiles of characteristics emerged among these attitudes, credited with remarkably consistency to certain healthcare professions. Social Identity Theory and the Contact Hypothesis helped explain study findings and

underlying dynamics that occur among the interactions between healthcare students and qualified professionals. The literature reported inconclusive findings regarding the impact of IPE on negative stereotyping, albeit the evidence suggests overall that the impact of IPE on attitudes is leaning towards positivity. The potential stability and resilience of stereotyped beliefs among undergraduate students is spotlighted amid this evidence, and the challenge for IPE to change negative attitudes amid dynamically active forces has become very clear.

The next section considers a concept which features prominently in the IPE literature, that is, students' 'readiness to learn interprofessionally' that has been correlated with professional stereotyping and strength of professional identity.

Section 3

3.5 Healthcare students' attitudes towards and readiness for interprofessional education and working.

3.5.1 Introduction

Students' 'readiness' for interprofessional education, emerged as a predominant, attitude-related theme within the IPE literature, and has been correlated with the aforementioned themes, strength of professional identity and stereotyping. The concept of 'readiness' is somewhat synonymous with willingness for and attitudes towards shared learning in the IPE literature. High attitudinal and readiness scores are suggestive of appreciation, embracement, and/or enthusiasm for the prospect of shared learning. Positive attitudes and outcomes for IPE have been associated with positive attitudes and outcomes of IPW, ultimately improving quality patient/client care (Campbell *et al.* 2001; Morey *et al.* 2002; Young *et al.* 2005; Curran *et al.* 2008; Coster *et al.* 2008; Pollard and Miers 2008; Reeves *et al.* 2009). Hence, this is an important variable to examine for the design and structure of IPE programmes.

Readiness for and attitudes towards IPE have been widely investigated among undergraduate students in many parts of the world, on course commencement, throughout training, before and after IPE and, to a lesser extent, following graduation. The most frequently used measures include the well validated, and reliable Readiness for Interprofessional Learning Scale (RIPLS) developed by Parsell and Bligh (1999), or the later version adapted by McFadyen (2006). Psychometric testing of the RIPLS was conducted in later studies, further augmenting reliability of the updated RIPLS (King *et al.* 2012). Other scales quite commonly used included the Interdisciplinary Education

Perception Scale (IEPS) (Luecht *et al.* 1990), and the UWE Interprofessional Questionnaire (IPQ) (Pollard *et al.* 2004, 2005, 2006; Pollard and Miers 2008).

A considerable body of research has reported overall positive attitudes to IPE among undergraduate students (Parsell and Bligh 1999; Horsburgh *et al.* 2001; Hind *et al.* 2003; Tunstall-Pedoe *et al.* 2003; Rudland and Miers 2005; Pollard *et al.* 2006; Pollard and Miers 2008; Coster *et al.* 2008; Rose *et al.* 2009; Bradley *et al.* 2009; Curran *et al.* 2008; Curran *et al.* 2010; McFadyen *et al.* 2010; Wilhelmsson *et al.* 2011; Cahill *et al.* 2013; Millar *et al.* 2013; Hood *et al.* 2014; Talwalkar et a. 2016). However, despite this strong evidence, positivity towards IPE cannot simply be assumed. Some studies, albeit fewer in number, reported negativity, mixed results or a decline in positivity towards IPE (Tunstall-Pedoe *et al.* 2003), often following an IPE intervention (Pollard *et al.* 2004; Coster *et al.* 2008; Pollard *et al.* 2006; McFadyen *et al.* 2010; Curran *et al.* 2010; Judge *et al.* 2015; Stull and Blue 2016).

This section of the literature review considers the body of selected evidence relating to attitudes/readiness as they relate to emerging subthemes; geographical perspectives, course commencement, impact of IPE and differences between healthcare professions. Finally, correlations of attitudes/readiness with learner characteristics, strength of professional identity, and/or professional stereotyping among the healthcare professions are examined.

3.5.2. Geographical perspectives

The purpose of briefly reporting study results from a geographical perspective is that they provide a wider conceptualisation of undergraduate student attitudes towards IPE

from around the world, thus illustrating a snapshot of comparable results across studies conducted over the last two decades.

Studies reporting positive high scores among undergraduate students' on readiness for interprofessional learning are numerous, with results comparable across the globe. Keshtkaran *et al.* (2014) in their Iranian study, reported high composite scores[20] of 78% among medical, nursing, and surgical technology students (n=250). In Singapore, Ahmad *et al.* (2013) in a modified version of the RIPLS, reported overall scores in excess of 76% among fir*s*t-year medical, nursing, pharmacy and dentistry students (n=460) during the first week on their course. Rose *et al.* (2009) in their American study involving nursing, medicine, occupational therapy, and physical therapy students (n=411) reported high composite RIPLS scores over 70%. Likewise, the UK study by Coster *et al.* (2008) involving dentistry, dietetics, medicine, midwifery, nursing, occupational therapy, pharmacy, and physiotherapy students (n=1683), reported scores ranging between 76% and 82%. High composite scores are also reflected in many other studies from around the world including; New Zealand (Horsburgh *et al.* 2001; Rudland and Mires 2005); Canada, (Curran *et al.* 2008; Curran *et al.* 2010); UK, Hind *et al.* 2003; Tunstall-Pedoe *et al.* 2003; Pollard *et al.* 2006; McFadyen *et al.* 2010) and the Republic of Ireland (Cusack *et al.* 2012).

Collectively, this data provides a strong worldwide sense of positivity towards the concept of shared learning among undergraduates irrespective of geographical location. This must potentially bode well for the global aim to provide a collaborative ready workforce within healthcare services. With that said, positivity among undergraduates

[20] The RIPLS consists of three or four subscales depending which version is used. The composite score entails scores added together for all subscales measuring the overall construct 'readiness' for IPE.

towards the concept of shared learning cannot always be expected, and embracement among undergraduates for the prospect of IPE can decline during the course of the students' academic programme. Unusually, the baseline findings in the longitudinal UK study by Pollard *et al.* (2004) reported negativity among students on course commencement. Other studies demonstrated a decline in positivity towards IPE over the course of the students' academic programme (Tunstall-Pedoe *et al.* 2003; Pollard *et al.* 2006; Coster *et al.* 2008; McFadyen *et al.* 2010; Curran *et al.* 2010) including that aforementioned by Pollard *et al.* (2004). When considered together, the majority of studies reported the decline after an IPE intervention. This places a question mark over the value of some IPE interventions. The next section provides some further insights with regard to this issue.

3.5.3 Impact of interprofessional education on attitudes to interprofessional education.

Studies that have investigated the impact of IPE on attitudes relating to readiness for, and attitudes towards shared learning, reveal mixed reports. A remarkable, pioneering study of note involved a longitudinal intervention, conducted in the University of the West of England, Bristol (UWE), investigating students' attitudes to IPE, firstly on entry to the course (n=852) (Pollard *et al.* 2004), then during the second year of training (n=723) (Pollard *et al.* 2005), then at qualification (n=581) (Pollard *et al.* 2006), and follow up investigating attitudes towards both IPE and IPW among qualified participants after nine months to one year post qualification (n= 275) (Pollard and Miers 2008). The final timepoint yielded data using the UWE Interprofessional Questionnaire (IPQ) (Pollard *et al.* 2004, 2005) from a diverse sample of qualified professionals including, general nursing, children's nursing, diagnostic imaging, learning disabilities

nursing, mental health nursing, midwifery, physiotherapy, radiotherapy and social work (n=275-experimental), all of whom had participated in the earlier stages of the study. A group who had not participated in IPE was used as comparator (n=139).

The critical findings from the study were that the students on the interprofessional programme, ultimately showed more confidence at qualification about their interpersonal skills, their interprofessional interactions, and demonstrated more positivity towards sharing learning, than students educated on the uni-professional curricula (Pollard *et al.* 2004, 2005, 2006; Pollard and Miers 2008). Whilst participants from the experimental group became more critical of IPE between qualification and practice, positive attitudes towards collaborative working appeared to be sustained because of IPE. The value of this study lies in that it confirms the potential benefit of IPE in undergraduate healthcare courses to achieve better future IPW, particularly when considered with the qualitative findings by Pollard *et al.* (2008), who observed that undergraduate IPE can not only enhance attitudes towards shared learning, and confidence among qualified professionals, but can heighten understanding of how inadequate IPW can impact negatively on quality patient/client care. The longitudinal study also showed that despite deteriorating views during the course (Pollard *et al.* 2006) in the end IPE appeared to be associated with positive outcomes, with achievement of IPE goals. These studies are among the few to demonstrate an impact of IPE beyond the educational aspect set within the confines of the university.

The main limitation of this study is the high attrition rate that incurred a loss of 577 students out of an original sample of 852. Furthermore, there are lessons to be learned from the data collection procedures used in the study. At the first, second and third timepoints, data was collected by the researchers in person, which very likely yielded

larger samples (Pollard *et al.* 2004, 2005, 2006). The postal method of questionnaire administration was quite possibly the fundamental reason for loss of participants at the fourth timepoint, thus highlighting the value of face to face data collection procedures over postal and possibly online methods.

A further study of note that used a longitudinal, quasi-experimental design was later conducted by McFadyen *et al.* (2010). Using the RIPLS and IEPS they evaluated the effect of a four year IPE intervention on attitudes to IPE among students of nursing, physiotherapy, occupational therapy, radiography, podiatry, and prosthetics and orthotics. Comparisons were drawn between a control (n=260) and an experimental group (n=313). The scores on readiness for interprofessional learning lowered after IPE in the experimental but not the control group. These results, congruent with those reported by Pollard *et al.* (2006), are possibly a sign of more realistic attitudes among the healthcare group towards shared learning over time. Pollard *et al.* (2006) viewed enhanced realism to be a positive outcome from IPE, asserting that the attainment of knowledge about the challenges and barriers associated with shared learning, could make participants more critical about involvement with this type of educational experience, but the associated realism could reduce unrealistic expectations about interprofessionalism. Limitations of this study saw loss of students over the timepoints due to non-participation, or non-adherence to the identifier code on the questionnaires.

More recent studies also reported declining attitudes or no significant increase in composite scores following IPE. Judge *et al.* (2015) investigated the effect of IPE on readiness for shared learning using the RIPLS, among students of dietetics, medicine, nursing, pharmacy and physical therapy (n=308), and found that composite readiness scores did not increase significantly for the groups after IPE. The study by Stull and

Blue (2016) previously discussed in relation to professional identity (section 3.3.2) reported a decline in students readiness for interprofessional learning following IPE.

One of the most unique and striking non-intervention studies (from a methodological design perspective) to investigate students' attitudes using the RIPLS, was conducted in Canada by King *et al.* (2012). This study provided broader insights beyond attitudes relating to the impact of IPE, to highlighting potential issues about developing IPE across institutions. Using a large and most diverse sample of healthcare students (n=1526) from varying years and some with IPE experience, this study compared four institutions categorised as; research-intensive, baccalaureate, polytechnical, and community college. There was a very wide assortment of programs involved, ranging from unlicensed courses to diploma, degree, and masters programs. Results revealed significant differences in students' RIPLS scores between the categories of institution. In general, students who had some previous IPE experience returned lower RIPLS scores that those who had not and this was taken to result from more realistic views by participants towards colleagues engendered by IPE (King *et al.* 2012). Enhanced realism as an outcome of IPE, was also reported by Foster and Macleod Clarke (2015) in relation to the modification of stereotypes through IPE, and also reported above in the studies by Pollard *et al.* (2006) and McFadyen *et al.* (2010).

Interestingly, King *et al.* (2012) argued that the development of IPE across institutions encounters barriers relating to the different institutional '*educational mandates'* (pg. 114). This could mean that a vision for developing National guidelines and common IPE curricula across institutions in the Republic of Ireland could quite conceivably be hampered by varying institutional educational directives and obligations. There are weaknesses and design issues in this study that warrant consideration when drawing

inferences. These primarily relate to the likelihood of a multitude of confounding variables brought about by the study design, whereby the immense differences and diversity among the courses and content, participants, type of institutions, learner characteristics, as well as influences from the hidden curriculum within the multitude of courses taking place in more than one institution. Whilst some IPE studies noted the use of one institution as a limitation to generalizability of findings, the study by King et al (2012) spotlights the advantages of using a single institution insofar as less variables relating to the influences of the hidden curriculum akin to individual institutions are likely to confound results.

Whilst measures of attitudes towards and readiness for IPE frequently yield high composite scores reflective of a cohort of mixed professions, it is important not to lose sight of individual scores from individual professions which may reveal significantly lower scores for certain groups. Rather than be subsumed amidst positive composite healthcare group scores, the individual differences in attitudes of professions warrant examination, and will be considered in the next section.

3.5.4 Differences between the healthcare professions.

When it comes to explaining differences in attitudes about interprofessional learning and working among undergraduate healthcare students, 'healthcare profession' presented as an important variable for consideration. Whilst composite scores for an entire healthcare group of students comprising all the various professions often yielded high scores, individual scores from some professions are frequently significantly lower than other groups. This potentially renders IPE more difficult to execute, becoming more challenging to achieve IPE goals in the face of differences in positivity towards this educational strategy between participating disciplines (Horsburgh *et al.* 2001;

Tunstall-Pedoe *et al.* 2003; Pollard *et al.* 2004, 2005, 2006; Horsburgh *et al.* 2006; Coster *et al.* 2008; Curran *et al.* 2008; Rose *et al.* 2009; McFadyen *et al.* 2010; Curran *et al.* 2010; Ryan 2010; Simin *et al.* 2010; Baker *et al.* 2011; Wilhelmsson *et al.* 2011).

The majority of studies investigating attitudes towards and readiness for shared learning reported differences between healthcare groups before and after IPE. There are varying reasons put forward in the literature for differences. Earlier studies by Horsburgh *et al.* (2001, 2006), revealed less enthusiasm for IPE among medical student than other professional disciplines. Horsburgh *et al.* (2006) argued this could have been a result of nursing students more inclined to think in collaborative terms, whilst medical students were more inclined to think in individualistic terms. However, other factors could be at play. Fallsberg and Hammar (2000) and Ponzer *et al.* (2004) found medical students to be more cynical about IPE, feeling that this strategy of learning was in conflict with their ambition to assume their physician roles. Concurring with these results, Morrison *et al.* (2004) found more positive attitudes among nursing students than medical students observing medical students to be more protective over their own learning.

Later studies conveyed similar findings. Coster *et al.* (2008) reported that readiness for interprofessional learning scores deteriorated among students during the first 3 years for all groups except nurses. The nursing students maintained positive attitudes to IPE throughout their course, and emerged as the most amenable group to change following IPE. In a vague attempt to explain this finding, Coster *et al.* (2008) argued that some healthcare professions are possibly just more susceptible to change following IPE than others. This view is corroborated among the findings by Judge *et al.* (2015) who also reported significantly improved RIPLS scores after IPE among the nursing group. Using a different validated scale to investigate attitudes to IPE, i.e., Attitudes towards

Interprofessional Health Care Teams Satisfaction Survey (Heinemann *et al.* 1999)[21], Curran *et al.* (2010) conducted a longitudinal, time series study involving nursing, medicine pharmacy and social work students (n=1179). Students participated in IPE modules that were placed from first year through to the fourth year of their training. The medical group retained lower scores on attitudes towards IPE for each year, than all other disciplines. Nursing and medical students had lower scores than pharmacy at baseline in first year the study was conducted, but medicine and pharmacy were lower than nursing in by the second and third year. McFadyen *et al.* (2010) reported some differences to the aforementioned studies. They found occupational therapy and physiotherapy students became increasingly more positive to teamwork after IPE more so than nursing, radiography, podiatry, and prosthetics and orthotics. They argued that the differences in positivity between groups were due to different experiences encountered by clinical placements. In the study by Judge *et al.* (2015), pharmacy had higher RIPLS scores than both nursing and medicine before IPE. Scores were also higher among the dietetics group before IPE than medical students. Judge *et al.* (2015) suggested that the way disciplines are grouped and the nature of the IPE interventions were important considerations for successful IPE outcomes.

Whilst the aforementioned studies are useful in that they spotlight how some professions will maintain their positive attitudes to IPE after an IPE intervention and that others will deteriorate, they are somewhat limited in their ability to explain these differences and why they occur. There is a sense that stereotyped views could be at the root of the differences. Hence, there is value in scrutinising how the disciplines rate

[21] This likert scale was developed based on the Readiness for Interprofessional Learning Scale (Parsell and Bligh 1999).

some of the individual items on the RIPLS to glean more insight as to the root of the attitudes. A few studies reported such items. In line with much evidence mentioned from the geographical perspective, Rose *et al.* (2009) reported generally high RIPLS scores among students of medicine, nursing, occupational therapy and physiotherapy (n=474). However, scrutiny of two items on the RIPLS exposed a possibly stereotyped belief among medical students that '*the function of nurses and therapists is mainly to provide support for doctors*' (item 17), and that medical students need '*to acquire more knowledge and skills than other healthcare students'* (item 19). Similar results were later reported in studies by Wilhelmsson *et al.* (2011) and Keshtkaran *et al.* (2014). Rose *et al.* (2009) concluded by arguing for the educational system to support medical students in particular to learn more effective collaboration and communication with other healthcare professionals. Whilst, it is questionable how this recommendation could be best executed in practice, there would appear to be some logic to the suggestion since these stereotyped beliefs expressed by medical students resonated with additional literature investigating or discussing the origin and problem of stereotypes (Hall 2005; Hean *et al.* 2006a; Baldwin 2007; Nisbet *et al.* 2008; Bradley *et al.* 2009; Ryan *et al.* 2010; Ajjawi *et al.* 2009).

It appears that cultural differences could sometimes explain differences in attitudes between professions to IPE. The Iranian cross sectional study by Keshtkaran *et al.* (2014) highlighted how cultural differences could play a part in how professions view IPE and IPW. As with aforementioned studies, this study also revealed significantly lower RIPLS scores from medical students than either nursing or science in surgical technology students. There was very wide disparity in the mean RIPLS scores between nursing and medicine. Nursing presented with exceptionally high mean scores of 93.68

out of a total scale score of 95, whereas medical students' total mean score was comparably low at 63.30. The medical group also produced lower scores on the first RIPLS subscale '*teamwork and collaboration'* than the other groups. As regards the individual subscale item 19, they felt they needed to acquire more knowledge than the other groups. Factors relating to Iranian culture could play a role in these results. In Iran medical students have the authority to provide medical treatment to patient/clients and refer patient/clients to other disciplines for aspects of care. Perhaps these lower readiness scores were a result of perceived authority over other professions resulting from these greater responsibilities. Furthermore, the authors pointed out that whilst nurses are considered a vital component of the IPW team, they are viewed as dependent upon the medical profession in Iran (Keshtkaran *et al.* 2014).

Some very recent studies corroborate the earlier data reporting higher RIPLS scores among nursing students, and nursing scoring higher on the teamwork and collaboration RIPLS subscale than medicine, thus indicating greater appreciation for IPE and IPW (Talwalkar *et al.* 2016; Wong *et al.* 2016). To revert back to the potential of cultural differences playing a part in attitudinal differences towards IPE, the later Asian study conducted by Ahmad *et al.* (2013) was incongruent with these previous findings. They found that while composite RIPLS scores revealed much enthusiasm for IPE, first year medical students were the group with the highest RIPLS scores, more so than nursing, pharmacy and dentistry students. The pharmacy and dentistry students also seemed to consider IPW less important than the nursing and medical students. The researchers argued this could have a basis in the popular belief or stereotype that nurses and doctors are the most critical professions on the team. However, this study did not explore

stereotyped attitudes among the sample with a view to correlating them with readiness for IPE scores, so this argument cannot be supported with any degree of certainty.

3.5.5 Summary

This evidence generally depicts high readiness to learn interprofessionally among undergraduate healthcare students on course commencement, at least in the absence of IPE. However, there is evidence demonstrating that readiness for IPE can diminish over time, often after an IPE intervention. The value of some IPE programmes must be called into question if they yield little improvement in attitudes, spotlight deteriorating positivity, or result in reinforced original negative attitudes. However, some researchers argue deteriorating attitudes result from an original naive idealistic and/or unrealistic expectation of what IPE can offer, or indicate greater realisation among students of the immense barriers to IPE. As with the aforementioned themes, these studies demonstrated that some healthcare professions have more positive attitudes towards IPE and IPW than others. The reasons for these differences vary and are not entirely conclusive in the literature.

The remaining two sections of this literature review provide further insights into attitudes towards IPE, considering potential influences of learner characteristics and socio-environmental experiences, and reporting correlations between professional identity, professional stereotyping, and readiness for interprofessional learning.

3.6 Influence of Learner characteristics and socio-environmental experiences.

Learner characteristics and demographic variables have been associated with professional stereotyping and attitudes towards IPE and IPW. They are worth examining because they can offer further insights and explanations as to why IPE is not always effective for certain individuals or groups. Some of these characteristics are directly associated with each other among the findings of many studies. The most frequently examined emerging from the IPE literature include: age (Tunstall-Pedoe *et al.* 2003; Pollard *et al.* 2005; Anderson and Thorpe 2008; Ahmad *et al.* 2013; Talwalkar *et al.* 2014; Wong *et al.* 2016), previous healthcare experience (Pollard *et al.* 2005; Pollard and Miers 2008; Wilhelmsson *et al.* 2011; Ahmad *et al.* 2013; Talwalkar *et al.* 2014, 2016; Wong *et al.* (2016), gender (Reynolds 2003; Pollard *et al.*, 2005, 2006; Adams *et al.* 2006; Pollard and Miers 2008; Coster *et al.* 2008; Curran *et al.* 2008; Bradley *et al.* 2009; Rose *et al.* 2009; McFadyen *et al.* 2010; Wilhelmsson *et al.* 2011; Ahmad *et al.* 2013; Talwalkar *et al.* 2014; 2016; Wong *et al.* 2016), relative healthcare professional (Tunstall-Pedoe *et al.* (2003; Ahmad *et al.* 2013), previous higher degree (Wong *et al.* 2016; Talwalker *et al.* 2016), and ethnicity (Coster *et al.* 2008; Ahmad *et al.* 2013).

Some IPE studies had learner characteristics primarily as the study focus. Among these include the recent longitudinal US study by Talwalkar *et al.* (2014; 2016) and Wong *et al.* (2016) conducted in Yale University. This study investigated relationships between student characteristics and views of IPE, among nursing, medicine and physician associate students (n=217). Using the Readiness for Interprofessional Learning Scale (Parsell and Bligh 1999) and the Interdisciplinary Education Perception Scale (Luecht *et*

al. 1990), data was collected at course commencement by Talwalkar *et al.* (2014, 2016), and then from the same cohort in their third year by Wong *et al.* (2016). Student characteristics associated with having more positive attitudes to IPE included females, nursing students, older students, those with previous healthcare experience and those with higher degrees. Lower degree, i.e. Bachelor degree, had no association with the high attitudinal scores. It appeared from the findings that students with an understanding of the roles of healthcare professionals, possibly resulting from previous work in healthcare as well as those with higher degrees, had more appreciation for the importance of teamwork. The limitations of the study noted also by the authors, warrant consideration when interpreting findings. These include small sample size, risk of selection bias, and that responses were believed to be affected by varying clinical experiences between the groups.A further Swedish study specifically examining learner characteristics/demographic variables was conducted by Wilhelmsson *et al.* (2011). This study investigated influence of gender, previous working experience in healthcare, educational programmes, curriculum design, and educational progress through the course, on attitudes towards IPE and IPW among nursing and medical students drawn from two universities (n=670). As with the previous study, results indicated that being female and a nurse were significantly associated with greater positivity towards IPE and IPW. These gendered attitudes did not change with educational progress throughout the academic programme of study. Since these findings support those reported in an earlier Swedish study by Hansson *et al.* (2010), Wilhelmsson *et al.* (2011), argued they are reflective of hierarchical structures present within the Swedish healthcare system at that time. The authors acknowledged that women co-existed with men in a democratic society with equal opportunities, but believed traditional hierarchical structures and sub-

cultures still prevailed within the healthcare service, and believed this was a system that women were possibly more willing to change than men (Wilhelmsson *et al.* (2011).

Alternative explanations for gender differences are among the findings in other studies. Gender emerged strongly as a variable of influence between students who had healthcare professionals as parents in the study by Tunstall-Pedoe *et al.* (2003). These students were more likely to hold stereotyped ideas of other disciplines, both positive and negative. In this study the medical students had more fathers who were doctors, and nursing students had more mothers who were nurses. These students were also more likely to describe nurses as '*dedicated'* and to describe doctors as '*arrogant'* (Pg. 164). These findings epitomise the strength of pre-course influences on students' choice of course, and the how attitudes and stereotypes are shaped by societal experiences prior to course entry. However, an alternative explanation is offered by Coster *et al.* (2008) who argued that gendered differences in attitudes to IPE were possibly due to variations in learning styles between males and females. Females appeared to emphasise listening and understanding the views of others during IPE than males. Females were also viewed as more inclined to understand and have acceptance of the viewpoints of others, a behaviour that was thought to naturally predispose them to greater willingness for shared learning. Another explanation posed by Reynolds (2003) was the idea that females are just more orientated to be positive about shared teamwork and shared learning because they appeared more predisposed to trust information received from other students. Many further studies reported similar findings to the aforementioned, with females appearing more amenable to IPE than their male student colleagues (Horsburgh *et al.* 2001; Pollard *et al.* 2005, 2006; Curran *et al.* 2008; Rose *et*

al. 2009), while others reported no influence of gender on attitudes (Bradley *et al.* 2009; Pollard and Miers 2008; McFadyen *et al.* 2010; King *et al.* 2012).

Probably the most frequently examined student characteristic in the literature associated with attitudes to IPE and IPW is gender, possibly because gender frequents debates surrounding status of women in society and within the healthcare professions, and is arguably an issue in what has often been historically considered a contentious relationship between nurses and doctors (Hall 2005; Baldwin 2007). However, the gender divide between men and women entering what were traditionally more male-dominated professions of medical and pharmacy has since balanced, so it is unlikely that gender is the reason for less positive attitudes reported towards IPE and IPW among the medical profession.

As one indicator of life experience, age appears to affect how mature students value sharing their learning with younger students, with some studies suggesting age might be a consideration in the design and participant selection in IPE programmes (Tunstall-Pedoe *et al.*, 2003; Pollard *et al.* 2005; Pollard and Miers 2008; Anderson and Thorpe 2008). Mature students indicated more enthusiasm to learn interprofessionally than those that had just left school in studies by Tunstall-Pedoe *et al.* (2003) and Pollard *et al.* (2005) and in recent studies by Talwalkar *et al.* (2014; 2016) and Wong *et al.* (2016). Pollard and Miers (2008) found that age negatively influenced qualified healthcare professionals' attitudes towards interactions by other disciplines, with older participants' attitudes less positive than their younger counterparts. Similarly, Anderson and Thorpe (2008) found that mature students valued IPE, but preferred to interact with students of their own age group. Not only were mature students less positive about shared learning than younger students, they were also more sensitive

about stereotyping. The age variable could quite conceivably bring about increased or decreased attitudinal scores depending on healthcare profession. This is because professions that are less likely to attract mature students such as medicine, or more likely to attract mature students such as nursing, could potentially show less/more overall positivity for shared learning based on age rather than healthcare profession per se.

There is a dearth of literature exploring the experiences of older students in an IPE context. Perhaps, as Shanahan (2000) found, these less positive mature students lack confidence in their capabilities, further pressured by a feeling that their course is potentially their last opportunity to demonstrate their abilities. Pollard and Miers (2008) argued the need for greater support for mature students entering the workforce, as greater challenges could be faced given that their prior life experiences may not '*fit'* with the organisation (pg. 412). They also, by virtue of the fact they are older, may have to live up to higher expectations in terms of skills and ability (Pollard and Miers 2008). This is an area worthy of further investigation as it is likely that institutions implementing IPE may need to ensure additional supports so the needs of mature students are met during educational interactions.

Ethnicity, previous healthcare experience, higher education experience, and previous IPE experience emerged as other, less frequently reported learner characteristics appearing to influence IPE attitudes. Lower readiness scores were evident among second year undergraduate students with previous experience of IPE in the study by Pollard *et al.* (2006), and among the mixed participants in the study by King *et al.* (2012). More realistic expectations of IPE resulting from previous experiences were thought to be the prevailing factor. Higher education experience was associated with

less positivity towards IPW in the study by Pollard and Miers (2008), and believed to result from prior knowledge about status and hierarchical differences between various healthcare occupations. Both Coster *et al.* (2008) and Wilhelmsson *et al.* (2011) reported that students with previous healthcare experience demonstrated greater readiness to learn interprofessionally, believed to be due to better understanding of the need for IPW for the delivery of quality patient/client care. Ethnicity also emerged as a variable of influence in the study by Coster *et al.* (2008) who found higher professional identity scores and higher readiness scores associated with students who described themselves as Black (African), and lower scores among students who described themselves as Asian (Indian), most likely resulting from cultural influences.

Contrary to the findings in many of the aforementioned studies, Ahmad *et al.* (2013) reported no significant association of readiness to learn interprofessionally with gender, age, ethnicity family members or previous healthcare experience. This study took place in an Asian university so perhaps these dissimilarities were also rooted in cultural differences. Ahmad *et al.* (2013) argued there is possibly less stereotyping by the medical profession, than has been seen in other studies around the world. However, this argument needs to be balanced in the context of the professions that took part in this study, i.e., pharmacy, medicine and dentistry. The results might have differed if other professions such as nursing, physiotherapy, occupational therapy or dietetics were part of the study sample.

3.7 Correlations between professional identity, stereotyping, learner characteristics and readiness for interprofessional learning.

A relatively small number of studies reported statistical relationships between strength of professional identity, stereotyping, learner characteristics, and readiness to learn interprofessionally, and/or predictions on the readiness for IPE variable (Hind *et al.* 2003; Adams *et al.* 2006; Coster et al 2008; Mc Fadyen *et al.* 2010; Stull and Blue 2016). These studies are important to consider because they provide further insights as to how the variables interact, impact or predict the other, thus providing better understanding about the nature of interactional dynamics among the healthcare professions, and provide evidence to inform the suitable timing of IPE interventions. It is important to identify that correlation does not mean causation (Bryman 2016) so these studies spotlight the direction and strength of relationships, but cannot provide conclusive reasons as to why relationships exists.

Gender has been identified as a predictor for strong professional identity, with females showing higher strength of identity than males in some studies (Coster *et al.* 2008; Adams *et al.* 2006; Pollard *et al.* 2006; Reynolds 2003). Adams *et al.* (2006) reported other variables as significant predictors of professional identity, such as professional course, previous healthcare experience, understanding and valuing of interprofessional team working, knowledge about own profession, and a higher ability to structure knowledge, what the authors called 'cognitive flexibility'.

Hind *et al.* (2003) and Coster *et al.* (2008) used the same reliable and well validated measures, the Professional Identity Scale to measure professional identity (Brown *et al.* 1986), and the Readiness for Interprofessional Learning Scale to measure readiness and attitudes towards IPE (Parsell and Bligh 1999). The study by Hind *et al.* (2003) was a

pioneering one that involved the first survey in the IPE field to look at hypothesised relationships between professional identity, stereotypes, and readiness for interprofessional learning. This study entailed a sample of undergraduate frontline healthcare students (n=933) of medicine, nursing, dietetics, pharmacy and physiotherapy drawn from one multi-Faculty UK university. Strength of professional identity and readiness for IPE were measured using the scales aforementioned. Stereotypes were measured using the Health Care Stereotypes Scale (Carpenter 1995a). This study yielded valuable insights as to the relationships between these variables, revealing that students who rated their own and other professions positively, had stronger professional identity. They also reported a positive relationship between professional identity and readiness for interprofessional learning, which implies that students with a greater feeling of group membership could be more willing to learn in a shared context with other healthcare professions. Positive stereotype ratings of own group (autostereotypes) and other group (heterostereotypes), were correlated with readiness for IPE in all groups with the exception of physiotherapy, meaning that nearly all groups were more willing to learn together when they had more positive ratings for their own and other professions.

Some of these findings were later corroborated by Coster *et al.* (2008) in their longitudinal survey involving undergraduate students of medicine, nursing, dentistry, dietetics, midwifery, occupational therapy, pharmacy and physiotherapy (n=1683). Positive correlations between readiness for interprofessional learning and professional identity scores were found, again indicating that higher scores for readiness were associated with higher strength of professional identity. However, Coster *et al.* (2008) caution that most associations were weak, so interpretations need to be viewed in that

light. This study was one of the most robust reviewed in the literature as not only did it involve a large sample, but also looked at changes in the scores over the course of four years, and involved three separate UK universities.

The correlations reported in both of these studies were strongest at baseline among the first year students and had a tendency to decline by course exit in all groups (except nursing in the study by Coster *et al.* 2008). This is an important finding because it adds to the debate questioning the most appropriate time to introduce IPE, and is suggestive that IPE may best be implemented early in the undergraduate programme to capitalise on both strong professional identity and positivity towards shared learning.

Coster *et al.* (2008) added further insights by examining the influence of contact between the students from the various professional groups on readiness and professional identity scores. Students from the different professions did not report much contact with each other, especially social contact, during the course of their academic programme. However, the contact scores did show a small positive correlation between amount of contact experienced with other professions and greater readiness to learn interprofessionally. This finding lends support to the Contact Hypothesis (Allport 1979) and corroborates the writings by Reeves (2000), Morison *et al.* (2003), Mu *et al.* (2004) and Freeth *et al.* (2005) who suggest that informal contact may have benefits for attitudes to IPE. The Contact Hypothesis assumes that contact between individuals from different groups, brings about positive change in stereotyped attitudes through the discovery of shared similarities (Hewstone and Brown, 1986).

It could be argued however, that these findings are somewhat counter-intuitive when considered in the light of Social Identity Theory, inter-group hypothesis whereby individuals naturally favour their own 'in-group' over the other 'out-group' (Tajfel *et al.*

1971; Turner 1999). One might expect that groups with stronger professional identity would be less inclined to want to share their learning with others from the 'ou*t*-group'. Perhaps as some studies suggest (Adams *et al.* 2006; Coster *et al.* 2008), the identity associated with being a healthcare student moves beyond the immediate healthcare group. There is also a wider identity associated with being a healthcare student, or being part of a Health Science Faculty in a university. Perhaps the wider group identity is sometimes foremost within the psyche of a student, particularly when they enter their professions and begin their courses. This could bode well for the development of an interprofessional identity at an early stage of training.

The later study by Stull and Blue (2016) added further insights to the timing debate reporting a positive correlation between a weakening professional identity and declining attitudes among first year students (n=864) from ten disciplines (occupational therapy, clinical laboratory science, dentistry, dental hygiene, dental therapy, medicine, nursing, pharmacy, public health, and veterinary medicine) following an IPE introductory course. This again could indicate that stronger professional identity potentially brings about more positive attitudes. In this study the IPE course had no impact on readiness for IPE or strengthening of professional identity The neophyte stage of professional identity development, whereby students did not yet understand a need for contact with other professions, or see the necessity to understand other professional roles, was put forward as an explanation. A limitation of this study saw the IPE sessions scheduled on Friday afternoons. Students complained about this and it is therefore quite possible that IPE ratings were lower as a result.

3.8 Concluding arguments

The literature reflects global appreciation for the potential of IPE for better collaborative teamwork and quality patient/client care, which bodes well for the future development of IPE in countries beginning or endeavouring to progress their IPE agenda, and for the advancement of IPE for those with established protocols. The empirical evidence that emerged from this literature review has characterised some of the fundamental debates within the IPE discourse community, and has drawn attention to a need to add to these debates and build upon existing evidence from an Irish perspective. Underlying the attitudes towards interprofessional education and working emerged a triad of interconnected variables, that is, professional identity, professional stereotyping, and students' readiness for IPE. These appeared to shape the formation of undergraduate healthcare students' attitudes, a process which evidently began before they commenced their courses.

The question of whether a strong or a weak professional identity bodes well for effective IPE outcomes remains an unresolved debate in the literature. If professional identity is undeveloped or weak, many are of the view that IPE would be best initiated later on in the course, or nearer to graduation. Conversely, a high strength of professional identity among undergraduates on course commencement is suggestive of early IPE suitability; that is if one subscribes to the view that strong identity probably yields better IPE learning outcomes. In support of this idea, some argued that early exposure to the clinical setting could translate into better understanding among students for both their own roles and that of other professions from the outset.

The other issue warranting attention relates to how IPE activities can take account of differences in strength of professional identities between the professions, to yield best

learning outcomes. It cannot be assumed that every discipline in a cohort of mixed healthcare students will present with the same level of identification. Mixed levels of professional identity between groups participating in IPE, along with fluctuating changes in levels of identity over time, pose a dilemma for group membership and timing of IPE activities. However, IPE provides a means whereby 'interprofessional' identities can be developed and achieving a balance between students' recognition of their individual professional identities and their shared professional identity could be the way forward. It is expected that IPE has the potential to dismantle destructive traditional hierarchical structures embedded within the culture of healthcare delivery. However, as professional identity strengthens within a profession, boundaries inevitably develop that invariably give rise to territoriality and tribalism. These power-related dynamics pose one of the greatest challenges for the laudable goals of IPE and IPW.

The broader picture of the evidence inconclusively suggested two opposing notions. The first is that weak professional identity could bring about failure of IPE or effective IPW, because students are insecure in their own roles and have yet to identify with their own profession before they can effectively engage in shared learning activities with other professions The second is that strong professional identity could bring about failure of IPE or effective IPW, as groups are so secure in their identities that they are possibly less inclined to accept learning with other disciplines. This side of the debate assumes that strong professional identity could potentially cause problematic interactions during IPE because of a greater likelihood of professional boundaries, territoriality and tribalism creating a barrier. In effect this intimates that the problems IPE aim to address, are the very problems creating barriers for effective engagement with and interactions during IPE.

Professional identity gives rise to social categorisation with resulting production of stereotypes. Stereotypes among the healthcare professionals appear to be a product of social discourse, often devoid of logic, and may not accurately represent a profession or the individuals that represent it. Negative stereotypes are inherently destructive by nature and not only present on course commencement among undergraduate students of healthcare, but also have the potential to persist over time, show resistance to change, and become reinforced instead of modified after IPE. They are a major source of conflict between healthcare professionals and can negatively impact on communication and collaborative working. Social Identity Theory (Turner 1999) and the Contact Hypothesis (Allport 1979) have a strong presence in the IPE literature, and help to explain the basis of stereotypes and the underlying dynamics that occur among professional interactions. In line with Social Identity theory, the literature identified a natural tendency among healthcare students to rate their own professions higher than others and reflected stereotypical portraits of characteristics akin to certain healthcare professions.

Assumptions and perceptions about professions as they relate to status and hierarchy also gives rise to stereotyping, and in conjunction with strong professional identification, can engender 'turf' related conflict, tribalism and rivalry. This is so problematic that students sometimes voiced lack of confidence to share their learning with professional groups accredited with higher academic ability or status. The hierarchies that are frequently embedded within healthcare systems undermine shared learning opportunities and teamwork among professions, obstructing rather than enabling the goal of teamwork that is safe quality patient/client healthcare delivery.

IPE has been well posited in the literature as potentially an antidote to negative professional stereotyping among healthcare students. However, much debate continues about whether or not IPE can in fact improve stereotyped attitudes or break down professional 'turf' related barriers. The potential of IPE seems to be somewhat contingent upon the way students view own and other professions. This highlights a paradox in that IPE can potentially address negative stereotypes, but negative stereotypes can also impact the potential of IPE. Considering the evidence through a theoretical lens, it would seem that in many interprofessional group situations that the Social Identity Theory (Tajfel 1978), whereby individuals favour members of their own 'in-group' over the 'ou*t*-group', is more dynamically at play than the Contact Hypothesis (Allport 1979), whereby contact between individuals from different groups, reveals mutual similarities that result in positive modification of stereotypical standpoints. With that said, whilst a failure of IPE to improve attitudes to the other group is sometimes reported, IPE appears to have the capacity to at least moderate stereotypes, generating greater realism among perceptions. Enhanced realism in itself is possibly a positive outcome of IPE because the attainment of more realistic perceptions about the abilities and characteristics of other professions might result in more effective IPW.

A third attitudinal theme featuring prominently in the IPE literature relates to students' readiness for IPE. The concept of readiness for IPE among undergraduate healthcare students emerged as an important variable for consideration for IPE development. Readiness for and positive attitudes towards IPE, along with positive outcomes from IPE interventions, has been associated with positive attitudes towards and outcomes for IPW. There is much global evidence to show that high readiness to learn

interprofessionally features among undergraduate students of healthcare on course commencement, leading many researchers to conclude that IPE should take place early to captivate this positivity.

However, positivity among undergraduates towards the concept of shared learning cannot always be expected and enthusiasm among undergraduates for the prospect of IPE can decline during the course of the students' academic programme. Also potentially problematic, as seen with strength of professional identity and stereotyping, are the differences in students' readiness for IPE between the healthcare professions. Some healthcare professions emerged as more amenable to IPE, or susceptible to change following IPE than others. These differences could create an operational challenge for IPE, as negativity among some students, could potentially undermine the potential of IPE for others. There are various explanations among the findings for differences namely, variations in learning styles, protection of professional boundaries, presence of stereotyped views about healthcare professions, and learner characteristics such as gender, age, previous healthcare experience, previous IPE courses or degrees, family members who are healthcare professionals, and ethnicity, with gender and age featuring most prominently. In general, males indicated less positivity for IPE than females, and mixed reports were evident relating to age with some studies finding mature students more enthused by IPE and others finding school leavers to benefit more.

Statistically significant relationships between two or more of the variables that are strength of professional identity, stereotyping, gender, and readiness to learn interprofessionally, were identified in a relatively small number of studies, thus providing greater understanding about the nature of the attitudes affecting interactions

between healthcare professions. Female gender emerged as a predictor for strong professional identity. Strong professional identity also showed potential for IPE insofar as positive correlations were found with readiness for shared learning and with higher ratings attributed to other professions, thus implying that students with a greater feeling of group membership could be more willing to learn in a shared context with other healthcare professions. Positive attribute ratings were also correlated with readiness for shared learning with most healthcare groups. The timing of IPE emerged as a potentially critical consideration, suggestive that IPE implemented early might capitalise on strong professional identity and positivity/readiness towards shared learning. It is possible that undergraduate students of healthcare have a broader identity associated with being a healthcare student or being part of a Health Science Faculty in a university, as well as a single identity associated with their own profession. This might explain the somewhat counterintuitive findings that students with strong identity are more ready for shared learning.

This literature review has brought to the fore a labyrinth of issues in the pursuit of producing a collaborative ready workforce for safer, quality patient/client care through interprofessional education. Changing negative attitudes between the healthcare professions is one of the fundamental learning outcomes for IPE interventions (Barr *et al.* 2005), and it is clear that IPE potentially has an essential role, but a challenging one, to modify negative attitudes among undergraduates. A triad of interconnected variables that is, professional identity, professional stereotyping and readiness to learn interprofessionally converged within the literature, helping to explain the genesis for attitudes towards IPE and IPW. These attitudes are a critical determinant for ensuring the success and sustained success of IPE, and in turn for the subsequent achievement of

effective collaborative teamwork. Students with negative attitudes towards IPE are often those people that gain the least from it (Coster *et al.* 2008; Horsburgh *et al.* 2006). Therefore, addressing these is a crucial task for IPE researchers and educators alike. For successful IPE to be sustainable, initial difficulties encountered during IPE need to be identified and resolved (Reeves and Freeth 2002). However, it is equally important that problems are identified in advance to inform the design of IPE, and before students engage with IPE. Designing and implementing IPE interventions in healthcare programmes is logistically very difficult in terms of scheduling and timetabling due to the curriculum requirements of the relevant bodies. The importance of identifying the origin, nature, existence and persistence of negative attitudes is paramount so IPE programmes and interventions can be suitably designed and tailored in a way that can mitigate encumbering attitudes.

There is a growing body of global robust evidence to indicate that IPE is having an overall positive impact on learners' attitudes with the trajectory in the direction of positive outcomes for collaborative teamwork (Reeves et al 2016). What is not yet known is the impact of IPE on collaborative working in the Republic of Ireland and more research is needed to inform the development of IPE programmes. The current IPE literature revealed a complete dearth of Irish studies investigating attitudes towards IPE and IPW, professional identity, stereotyping and readiness for IPE among undergraduate healthcare students in the Republic of Ireland, with no studies that have investigated relationships between these variables. There is also a dearth of evidence to indicate whether undergraduate healthcare students attribute equal importance to the presence of the different healthcare professions on the IPW team or their conceptions about the value of teamwork. Furthermore, there is limited research in the European

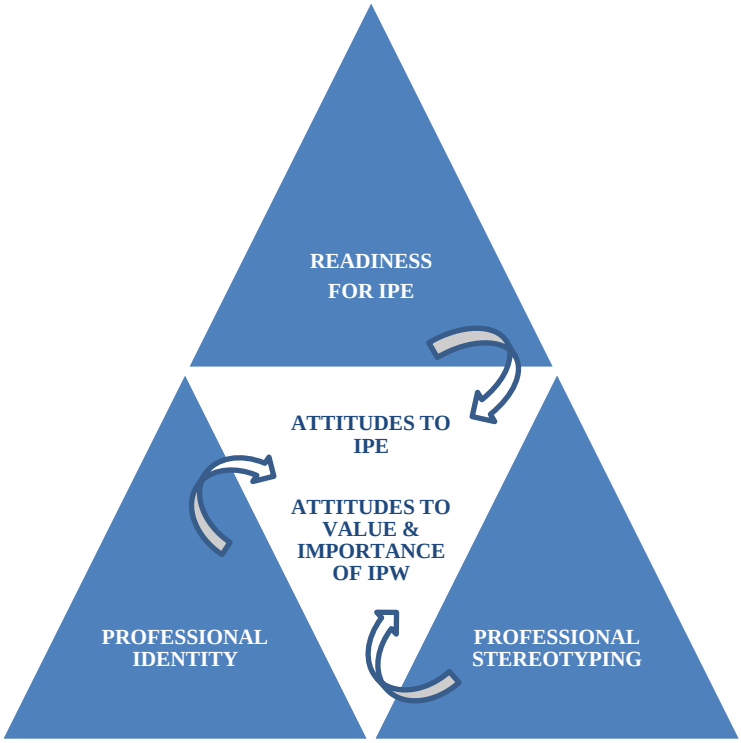
and Global literature that has investigated relationships between these variables. This study is also unique because it is the first study to use these four scales in unison, that is, the Interprofessional Working Scale (While and Barriball 1999), Professional Identity Scale (Brown *et al.* 1986), Student Stereotypes Rating Questionnaire (Barnes *et al.* 2000; Hean *et al.* 2006a and 2006b) and the Readiness for Interprofessional Learning Scale (Parsell and Bligh 1999; Mc Fadyen *et al.* 2005). It is anticipated that further insights will be gleaned into the suitability of these measures. This study will make a unique contribution to the IPE field from an Irish perspective, to inform the development and implementation of effective future IPE programmes in this institution, and other HEI's around the country. The ultimate goal is to improve interprofessional collaboration for safe, quality healthcare delivery in the Republic of Ireland.

The question remains as to whether or not new undergraduate healthcare students from various disciplines in the context of Irish healthcare education, value interprofessional education and working. It is also unclear as to whether they present with a strong or weak professional identity, hold stereotyped views of their own and other professions, or indicate 'readiness' to learn interprofessionally and whether any of these variables are associated with the other. On the basis of international evidence it could be hypothesised that undergraduate students in an Irish academic context will also enter their courses with pre-defined stereotyped views and present with perceptions of inequality in the way they perceive the status of the healthcare professions. It could also be hypothesised that these students will indicate pre-course formation of professional identity and readiness for shared learning. This data could yield valuable insights as to how IPE should be designed in terms of participation, content and the employment of strategies for improving and interrogating negative perceptions. The

most appropriate time to introduce IPE in an academic healthcare course remains open to debate, and is also worthy of examination in an Irish context. The longitudinal design of this study could give an indication of when best to place IPE based on potential changes in attitudinal measures and strength of professional identity scores between the first and second year of the programme. The use of the non-healthcare comparator group should help to ascertain if the views are representative of the healthcare students from the same Faculty of Health Sciences in this university or representative of wider society.

This literature review has explored the existing field of knowledge and body of evidence that reports attitudes towards interprofessional education and working among undergraduate healthcare students. A triad of interconnected themes emerged that is, professional identity, stereotyping and readiness to learn interprofessionally. The triangulation of these themes helps to explain the origin of attitudes and depict their potentially problematic nature and impact on the goals of IPE and IPW (figure 3.1).

Figure 3.1 Triad of interconnected influences on attitudes to IPE and IPW



The convergence of these themes in the literature has provided a framework for this inquiry and formed the basis for the study objectives. Before proceeding to the following chapters which provide the methodological details of the study, the next sections conclude this chapter with the study aims and objectives and finally some reflective thoughts on the literature review process and potential challenges ahead.

3.9 Study aims and objectives.

3.9.1 Aim

To: 1. Investigate the attitudes of undergraduate healthcare students in an Irish university towards interprofessional education, and 2. Investigate the attitudes of undergraduate healthcare students in an Irish university towards interprofessional working at course commencement and at the beginning of the second year, in order to inform the development and implementation of interprofessional education interventions.

3.9.2 Specific objectives

-To ascertain the value undergraduate healthcare students attribute to interprofessional working.

-To examine differences in value attributed to interprofessional working between healthcare student groups and the comparator group.

-To examine if undergraduate healthcare students and comparator group attribute equal importance to the presence of different healthcare professions on the interprofessional working team.

-To investigate the strength of professional identity among undergraduate healthcare students.

-To determine if there are differences in level of professional identification between the healthcare student groups.

-To measure undergraduate healthcare students' readiness for interprofessional learning.

-To determine if there are differences in readiness for interprofessional learning between the healthcare groups.

-To investigate the existence of stereotypes among the undergraduate healthcare students.

-To examine differences in stereotyped views between healthcare student groups and the comparator group.

-To ascertain if there are gender differences on value attributed to interprofessional working.

--To ascertain if there are gender differences on readiness for interprofessional learning.

-To investigate changes over a 12 month period from course commencement.

--To investigate relationships at baseline between stereotyping and readiness for interprofessional learning.

- To ascertain predictive ability of strength professional identity, value attributed to IPW and learner characteristics on readiness for interprofessional learning at baseline.

3.10 *The Inward Journey*

The process of excavating such a vast amount of literature and presenting it in a synthesised way was extremely challenging, but also inspiring. The emergence of IPE across the globe is strongly evident in the IPE literature and it was a fulfilling experience to uncover how it could fit into undergraduate healthcare education in this country. I found myself irresistibly more drawn to the literature that revered IPE so I

had to become critical of how I selected and reported the literature to ensure a balanced representation of the topic. My thoughts and conceptualisations about the significance of IPE and IPW compiled from my search can be illustrated quite simply by the image of a bridge (figure 3.2).

Figure 3.2 Conceptualisation of interprofessional education as a bridge to interprofessional working and ultimately to quality, safe patient care delivery

The heart and soul of my research lies below this beautiful bridge, embedded within its foundations. Therein also lays the myriad of influences from my own personal experiences that have shaped my perception of IPE, its benefits and where my research fits in to this picture. The foundations are greater in number under the supports for IPE than for IPW. This is symbolic because it signifies my belief that the foundations for effective IPW are fundamentally laid down during the undergraduate years. Indeed

solid and sustainable foundations of any worthwhile endeavour are critically important, not least when it comes to constructing a quality, safe healthcare system for every citizen in Ireland.

By comparison to my preliminary review of the literature which first inspired this PhD, deeper excavation of the literature unearthed a far more complex scenario for successful IPE implementation. As much as the potential benefits of IPE are simple to understand, developing and implementing IPE seems somewhat elusive and ambiguous. Even if the physical 'siloed' structure of our Faculty was transformed into a common building and our schedules synchronised, the traditional power relations and territorial professional boundaries seem likely to be problematic, as could the stereotyped attitudes rooted in traditions and societal beliefs that students appear likely to bring to their healthcare courses.

Chapter 4 Theoretical and Methodological Perspectives

4.1 Introduction

The significance of conducting this study was determined by the literature review that highlighted a global problem with interprofessional working and teamwork between healthcare professionals (section 2.2). This problem can effect quality patient care and result in poorer patient outcomes (section 2.2). The literature review highlighted evidence that showed well-timed interprofessional education (IPE) in undergraduate healthcare programmes can produce graduates that are better equipped to work collaboratively on interprofessional teams. However, the literature review also highlighted many complexities involved in the implementation of effective IPE, with a multitude of barriers not only rooted in a practical domain entailing operational systems and structures, but also relating to how perspectives and attitudes of students can impact on IPE success. If students are unwilling to share learning, work on teams with other healthcare professionals, or harbour negative stereotypes towards other professionals, the success of IPE is potentially negated. Strength of professional identity can also have an impact on IPE outcomes, and has been associated with readiness to learn interprofessionally and the stereotyped views held by students about other professional groups. No Irish study has been conducted to examine these variables in unison or the relationship between them to inform IPE development in this country.

The philosophical and theoretical perspectives underpinning this study were determined by the study aim and objectives. This chapter presents the philosophical approach and

theoretical framework which guided the research design. The worldview held by the researcher that formed the basis for the choice of research methods to conduct this inquiry is illuminated. The rationale for the choice of study design to get to the truth of the phenomena under investigation is argued.

4.2 Philosophical perspectives

4.2.1 Changing paradigms in healthcare and healthcare education.

The concept of a paradigm was used in 1962 by the philosopher of science and historian, Thomas Kuhn, to describe a framework of common understanding, perception and beliefs within which theory and practice operate. The term ‘paradigm shift’ is used to illustrate periodic revolutions which take place in the progression of science and entails a type of metamorphosis whereby a change from one way of thinking or conceptual worldview to another takes place. According to Kuhn (1962), a state of crisis occurs within a scientific discipline when enough significant problems have accumulated against a current paradigm resulting in the appearance and testing of new and sometimes previously rejected ideas. A new paradigm is subsequently developed marking the beginning of an intellectual "battle" between supporters of the new paradigm, and the followers of the old paradigm.

From an IPE and IPW perspective, the concept of a paradigm shift closely resonates with the global change in the way approaches to healthcare delivery and healthcare education have developed and continue to develop, with greater awareness of problems relating to lack of teamwork and poorer patient outcomes (WHO 2010). Indeed

healthcare education is undergoing a global paradigm shift from a uni-professional to an interprofessional approach. This paradigm shift sees IPW as integral to providing quality healthcare and has stimulated the need for a new way to educate future healthcare graduates. Hence, as the global evidence in favour of collaborative working and an interprofessional approach to education accumulates (Salvatori *et al.* 2007; Lidskog *et al.* 2008; Pollard and Miers 2008; Coster *et al.* 2008; WHO, 2010) the original 'universally accepted' paradigm (Kuhn 1962) of healthcare education has been and continues to be under scrutiny.

4.2.2 Ontological, epistemological and methodological positions

After choosing a research topic, a researcher has to consider how to go about investigating it. How this is done will depend on how truth and knowledge is viewed and the beliefs, assumptions and ways of thinking about humans and society (Schwandt, 2001). The essential question that has to be posed for this research, like all research, is how can the researcher get to the truth about the topic under study? This question needs to be considered through the paradigmatic fundamentals of ontology, epistemology and methodology (Blaikie 1993; Guba and Lincoln 1994; Bunniss and Kelly 2010; Rolfe 2013). Ontology represents the starting point for research referring to the science of existence or 'being real' and what one believes about the nature of reality (Crotty 1998). It questions is there one reality knowable within probability or are there multiple socially constructed realities. Its significance lies in that it questions if physical parts are more real than immaterial concepts (Blaikie 1993; Guba and Lincoln 1994).

Epistemological and methodological positions logically flow following the ontological position of the research and epistemological questions surface from ontological

concerns (Crotty 1998; Hall 2003). Epistemology is concerned with the theory of knowledge, how the researcher gets to know reality and poses the question; how do we know what we know? (Blaikie 1993; Guba and Lincoln 1994). Epistemology addresses philosophical questions like what is knowledge, what is the basis and meaning of true knowledge, and how can individuals get to know something. Claims to true knowledge must be factual, justifiable and believed by an individual making the claim. Belief in itself is not knowledge and beliefs are justified through good quality, logical and reasonable evidence. Ontology and epistemology have an inter-dependant relationship whereby each informs and depends upon the other (Crotty 1998; Hall 2003).

From an ontological perspective the researcher encompasses the view that there is one knowable reality whereby the nature of knowledge is objective (Guba and Lincoln 1994). This research aimed to objectively measure if students of healthcare were ready to learn interprofessionally and if they understood the importance of interprofessional teamwork based on their own experiences and realities. It sought also to find associations between variables, identify potential predictors for shared learning, and measure changes in these over time. The epistemological view of the researcher dictates that, in order to produce true knowledge about these topics, they need to be investigated in a way that can produce objective data.

Methodology is underpinned by a researcher's ontological and epistemological beliefs and addresses techniques about how the world around us should be studied and if it is to be valid, must be in keeping with its prevailing ontology (Hall 2003). It relates to the way the researcher accesses and obtains knowledge to address the inquiry (Blaikie 1993; Guba and Lincoln 1994; Killam 2013). In other words it encompasses the tools

the researcher uses to get to know the reality under investigation, taking into account the overarching philosophical and theoretical frameworks which guide the research (Sarantakos 2013). The epistemological orientation held by the researcher led to the question of how the inquirer can find out what they think can be known and what ways can this be done to suit the study purpose (Guba and Lincoln, 1994). This involved choosing the most appropriate methodology for this study and in turn the method, which in itself deals with the practicalities of obtaining the data to answer the research questions (Polit and Hungler 2008).

4.2.3 Research paradigm and methodological orientation of study

Approaches to research can be viewed as rooted in three philosophical perspectives namely positivism, interpretivism and realism, with researchers traditionally divided between two strongly contrasting paradigms to understand the world (Killam 2013; Parahoo 2014; Bryman 2016). These paradigms include the inductive-qualitative paradigm positioned within interpretivism, and the deductive-quantitative paradigm, originating in the natural sciences, and positioned within positivism (Bryman 2016). Research designs grounded in interpretivism involve qualitative methods which are frequently designed as grounded theory, phenomenology or ethnography in order to explore meaning. They usually entail strategies such as participant observation, interviews and case studies to collect data (Polit and Hungler 2008; Parahoo 2014; Bryman 2016). The underlying ontological and epistemological premise for qualitative approaches to inquiry is that there are many elusive realities, reality is socially constructed, and knowledge cannot be objectified or decontextualized (Creswell 2013). Knowledge therefore is subjective and the methodological purpose of the research is to understand individuals' experiences. On the other hand, research designs grounded in

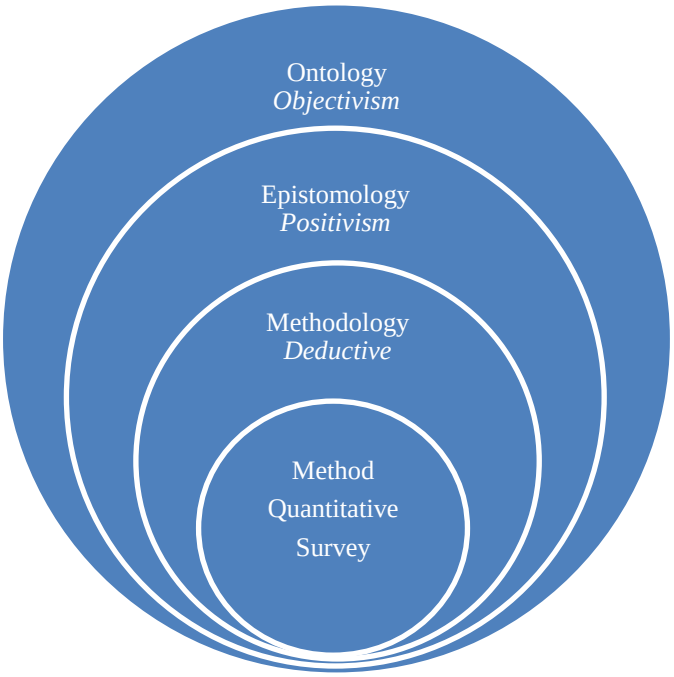
positivism entail empirical methods with quantitative analysis and measurement, and often involve experiments and surveys (Matthews and Ross 2010; Parahoo 2014; Bryman 2016). These approaches reflect the belief that social as well as physical phenomena are both measureable and observable, subscribing to the view that in order to establish truth and the foundation of true knowledge, phenomena should be objectively and scientifically measured (Burke Johnson and Onwuegbuzie 2004; Matthews and Ross 2010; Parahoo 2014; Bryman 2016).

From an epistemological perspective, positivism assumes that knowledge is objective and independent of the values or feelings of the investigator and can be utilised to explicate, control or predict behaviours or situations in any cultural or social context (Burke Johnson and Onwuegbuzie (2004). Within this paradigm the researcher's relationship with the social phenomena under investigation and the social world is objective, with the capacity to empirically test statements of belief or fact (Matthews and Ross 2010). This knowledge can be verified or unverified and results of studies have the potential to be generalised to other populations and context (Matthews and Ross 2010).

This study is positioned within the positivist, deductive-quantitative paradigm which has guided the thinking behind and formed the basis for the research choices and activities. Figure 4.1 illustrates the interrelated philosophical and methodological approaches determined by the research purpose of this inquiry. This study entails a quantitative non-experimental research design that views the researcher as independent and objective. However, whilst predominantly grounded in a positivist approach, causality is not the goal of this study. Rather it seeks to identify differences between

variables, seek correlations between variables, and find predictions though statistical analysis. Although the purpose of this study is not to seek cause and effect relationships, objectivism is epistemologically consistent with the study purpose insofar as statistical tests are used to identify correlations and predictions (Bryman 2016; Polit and Beck 2017).

Figure 4.1 Interrelated philosophical and methodological approaches of the research design



4.3 Theoretical perspectives

During the course of the literature review, it became evident that the conceptual development of interprofessional learning, as it relates to healthcare education, has lagged to some extent (Cooper *et al.* 2005; Barr *et al.* 2005; Hean and Dickinson 2005; D'Eon 2005; Rodger and Hoffman 2010; Reeves and Hean 2013), with IPE curricular design and delivery criticised for dominance of adult learning theories to underpin its development (Reeves and Hean 2013). Nevertheless, whilst many research studies lacked any theoretical framework, there is growing evidence depicting the usefulness of social psychology theories to understand the nature of stereotypes and explain barriers between healthcare disciplines and collaborative teamwork to IPE (Hind *et al.* 2003; Hean *et al.* 2006b; Lidskog *et al.* 2008; Coster *et al.* 2008). Furthermore, they are been used to explain the essential role of professional identity in IPE interactions (Hind *et al.* 2003; Adams *et al.* 2006). Social psychology theories can be utilised to guide the structure, implementation and evaluation of IPE practice. Before discussing these concepts, the interrelated problem of professional stereotyping will be addressed.

4.3.1 Professional stereotyping

Stereotypes relate to social, categorical judgements of people with respect to their group membership (Turner 1999). Stereotypical categorisation is prevalent within all types of cultures forming a fundamental part of the socialisation process, and forming a way that humans process information about the world (Judd and Park 1993). Stereotyping of professional healthcare groups is a natural consequence of social categorisation (Tajfel 1978; Turner 1999). Stereotypes are not necessarily incorrect or negative and often reflect reality (Judd and Park 1993; Niven 1994; McGarty *et al.* 2002), but can be problematic when they become expected behaviour from professional groups (Allport

1979). Whilst stereotypes about healthcare professions may have elements of truth in reality, they are neither an accurate or reasonable way to judge the abilities of a professional group (Allport 1979; Hind *et al.* 2003; Hean et al 2006b). Furthermore, they can form the basis for prejudices which in turn can become a destructive activity played out in the form of discrimination (Allport 1979). Attitudes are a product of stereotypes which, as Stull and blue (2016) suggest, adversely affect interprofessional collaboration between healthcare professionals when negative in nature. For example, the stereotype that the nurse is a handmaiden to the doctor has resulted in low collective esteem for this profession (Takase *et al.* 2001; Baker *et al.* 2011). Tunstall-Pedoe *et al.* (2003) and Hean *et al.* (20006a and 2000b) have strongly argued that healthcare students enter their courses with stereotyped views already formed of their own and other healthcare professions and whilst these can sometimes be useful in IPE situations, they can be a source of great conflict between student groups. Contact theory provides solutions for individuals and groups to move beyond stereotypical perceptions (Allport 1979; Hewstone and Brown 1986; Hewstone *et al.* 1994) and its relevance in the context of IPE will be discussed in the next section.

4.3.2 Social Psychology theories

Membership of a healthcare professional group is not only a sociological state but also a psychological state. The genesis of this research study is fundamentally underpinned by two social psychology theories; the Contact Hypothesis (Allport 1954 and 1979; Hewstone and Brown 1986; Hewstone *et al.* 1994) and Social Identity Theory (SIT) (Taifel 1971; Turner 1999). Inter-group dynamics, the complexity of interprofessional relationships in healthcare, and professional stereotyping relating to IPE and collaborative working, have been expounded through these theories in earlier IPE

research studies (Hind *et al.* 2003; Mandy *et al.* 2004; Tunstall-Pedoe *et al.* 2003; Hean and Dickinson 2005; Adams *et al.* 2006; Hean *et al.* 2006a and b; Michalec *et al.* 2013). The closely related Contact Hypothesis and Social Identity Theory (SIT) provide an effective lens through which the potential role of IPE in addressing destructive stereotyping, discrimination, and prejudice between the healthcare professions to afford improved collaborative working, can be better understood (Hean and Dickinson 2005; Hean *et al.* 2006a).

4.3.2.1 Contact Hypothesis

The Contact Hypothesis, first proposed in 1954 by the psychologist Gordon Allport, encompasses a phenomenon whereby individuals who interact with each other are less likely to develop prejudices towards the culture of others. It has been argued by IPE champions to be a very useful theory to inform the development and implementation of IPE (Hean and Dickinson 2005; Thistlethwaite 2012; Barr 2013) with early evidence showing that application of the Contact Hypothesis to IPE brings about more positive attitudes towards other professional disciplines (Carpenter 1995a and 1995b; Hewstone *et al.* 1994; Carpenter and Hewstone 1996). The underlying assumption of the Contact Hypothesis is that contact between members of different groups engenders positive change in stereotyped attitudes through the discovery of shared similarities (Hewstone and Brown, 1986; Carpenter and Hewstone 1996; Mandy *et al.* 2004; Hean *et al.* 2006b). Hence, this theory has much relevance for IPE which assumes if healthcare students are placed in a shared learning environment, not only can they learn with, from, and about each other, but negative stereotyped viewpoints that are presumed to impede collaborative working can be modified (Hean and Dickinson 2005; Hean *et al.* 2006b; Curran *et al.* 2008; Carpenter and Dickinson 2016). It is important to note Allport

(1979) contended that mere contact is insufficient to bring about positive changes in attitude and proposed certain conditions which include; institutional and social support, students sharing common goals and co-operating with each other, and an atmosphere of mutual respect and equality. Hewstone and Brown (1986) further developed this work expanding these conditions to include willingness to understand group similarities as well as differences, effective collaborative group work and positive group expectations. The contention is that just placing students in a room together, which in the IPE literature has been termed 'multiprofessional education' (Carpenter and Dickinson 2016), is not likely to achieve either understanding of other professional roles, or improve negative stereotypes.

As previously stated, a key assumption of contact theory is that the groups must have equal status, and all groups must acknowledge and perceive an equal status relationship. Allport (1979) argues that exposure to situations whereby individuals are represented and regarded as equals can lead to acceptance and mutual understandings. Carpenter and Dickinson (2016) argue that without equal status between professionals groups, achieving attitudinal modification through IPE may not be possible. Indeed the study by Barnes *et al.* (2000) concluded that there was no change in stereotyped attitudes through contact possibly because some conditions had not been met. The realisation of equal status between the healthcare professions has a troubled history (Hall 2005; Baldwin 2007; Baker *et al.* 2011), with many studies identifying a situation whereby some professions, such as medicine, were notably rated higher in status (Hean *et al.* 2006a; Nisbet *et al.* 2008; Bradley *et al.* 2009; Michalec *et al.* 2013) and for academic ability by students (Anderson and Thorpe 2008; Michalec *et al.* 2013). This is reported to create a sense of inferiority for other groups learning with this discipline (Anderson

and Thorpe 2008). Thus, whilst contact has the potential to improve relationships between groups, it appears this cannot always be assumed and to attain the optimum conditions within IPE whereby positive changes in attitudes and stereotypes can be achieved, is an immense challenge for IPE facilitators (Barnes *et al.* 2000; Hean and Dickinson 2005). However, this theory has merit as a theoretical tool to inform, guide and evaluate the implementation of interprofessional learning endeavours. If use of this theory even serves to offer explanations as to why IPE has failed to improve attitudes between groups and encourages questions to be asked as to how these difficulties can be overcome, it has value to inform future inquiry into this topic area.

4.3.2.2 Social Identity Theory

Social Identity Theory (SIT) (Tajfel 1978; Tajfel 1981) was originally developed by Henry Taifel to understand the psychological basis of intergroup discrimination and conflict as a function of group-based self-definitions. The underlying premise of SIT highlights that members of a group favour the participants in their own 'in-group' over the other participants in the 'ou*t*-group'. SIT is also based on the principle that individuals can derive their definition of self from their group membership, and postulates that behaviours and attitudes of group members towards other groups are directed by the strength of the social identity of the group members (Tajfel and Turner 1985; Turner 1999). Professional identity is one form of social identity that relates to how individuals distinguish or compare themselves to different professional groups (Brown *et al.* 1986; Adams *et al.* 2006; Michalec *et al.* 2013; Stull and Blue 2016). According to Schein (1978), professional identity develops over time and involves the acquisition of insight into the values, practices and skills of the profession and is directly associated with the professional roles undertaken by the group members. The

social group of interest in the IPE context and in the context of this study is the healthcare group of students. Membership in a professional group brings about the development of professional identity through socialisation whereby students learn about professional practices and adopt the skills, attitudes, values, and beliefs of their profession (Adams *et al.* 2006; Coster *et al.* 2008; Michalec *et al.* 2013; Stull and Blue 2016) as well as embracing the occupational culture of the group (Merton *et al.* 1957).

After social categorisation takes place there is a tendency for individuals to make social comparisons between their own group and others, seeking differences and similarities (Tajfel 1978; Turner 1999). SIT suggests that individuals naturally desire to view themselves and the social groups they subscribe to, positively by comparison to others. Once individuals are categorised into groups, a phenomenon takes places which sees similarities accentuated and differences minimised within the groups (Tajfel 1978). This phenomenon has consequences for identity and how one perceives the self, resulting in a re-definition of how an individual sees the self. Individuals then categorise themselves in accordance with group labels, such as in the case of healthcare students; nurse, student, medical student etc. Subsequently, a process begins whereby individuals envisage themselves as similar to others within their group and begin to shape their behaviour and actions in a way that is considered in keeping with the category (Turner 1999). The self-concept and how individuals feel about themselves, in other words their self-esteem, is linked in to group comparison (Taifel 1978). Groups have varying social status and individuals within a group strive to preserve and enhance self-esteem through their group membership, naturally desiring membership of the group with perceived higher social status. Taifel (1978) identifies this desire as 'positive distinctiveness'. This phenomenon is often played out among healthcare

professional groups who view their in-group more positively than an ou*t*-group while working on teams or sharing their learning (Hean *et al.* 2006b). Negative stereotypes or attitudes toward the ou*t*-group can result in conflict and competition between groups, producing a challenge for the goals of IPE and for effective collaborative working and clearly poses a challenge for the pursuit of equality between the healthcare professions.

The usefulness of SIT as an underlying theory in the context of IPE lies in its potential to help IPE educators understand the aforementioned processes governing intergroup relations and the student learning that results (Hean *et al.* 2006b). This theory has been previously used by IPE researchers to explore how students interact with and compare their own group with other groups. It has gained prominence in the literature providing a useful framework for understanding how professional stereotyping among the healthcare professions and strength of professional identity affect group interactions during shared learning (Hind *et al.* 2003; Mandy *et al.* 2004; Hean *et al.* 2006b; Adams *et al.* 2006). The debate in the literature of whether IPE is best introduced in the presence of a strong professional identity or a weak one continues. This study draws on SIT to explore professional identity in a group of undergraduate healthcare students and hopes to add to the debate.

4.4 Research design perspectives

4.4.1 Overview of study design

The paradigm reflecting the researchers' framework of philosophical beliefs and values has been argued. However, it is critical that a research design is fundamentally and practically guided by the study purpose, the nature of the information required, and should specify the study components needed to address the problem in a logical and coherent way (Polit and Hungler 2008; Parahoo 2014; Patton 2015). In other words, it should provide a means by which individual tasks may fit together in common purpose (Patton 2015). An inappropriate design can create issues for validity and reliability of the data (Parahoo 2014). With these essential points considered, it was important to carefully reflect upon the true nature of the social phenomena under investigation and the purpose of the study objectives to select the most suitable approaches to guide its successful execution.

The research design chosen to meet the aims and objectives of this study is a longitudinal cohort survey as described by Bryman (2016), which included a non-healthcare comparison group and a correlational approach to data analysis. From a practical viewpoint, surveys have been widely used as a key approach for conducting similar research in the IPE/IPW field (Hind *et al.* 2003; Tunstall-Pedoe *et al.* 2003; Coster *et al.* 2008; McFadyen *et al.* 2010; Ateah *et al.* 2011; Michalec *et al.* 2013), and as such represent a 'tried and tested' method to generate relevant information and add to the knowledge base. Studies with comparable objectives, sourced through the literature review, also informed this choice (While and Barriball 1999; Hind *et al.* 2003; Coster *et al.* 2008; Adams *et al.* 2006; Ahmad *et al.* 2013; Michalec *et al.* 2013). In these

aforementioned studies, quantitative surveys were successfully used to yield information about undergraduate healthcare student' views on IPW/IPE. These studies have included some or all of the key variables that this study seeks to examine, that is, professional identity, readiness to learn interprofessionally and professional stereotyping. As previously described from the philosophical standpoint, this is essentially a quantitative, non-experimental research design grounded in the positivist paradigm. However, whilst the design of this study is fundamentally grounded in positivism, open-ended questions also incorporated into the survey, the rationale for which is explained in section 4.5.5.

4.4.2 Rationale for research design

There are many different ways to categorise research designs and the overarching classification of quantitative and qualitative designs can be further classified to reflect a particular set of study objectives and approach. There is no consensus on the actual correct classification of quantitative research (Parahoo 2014). However, quantitative research designs are frequently classed as follows; experimental or causal, quasi experimental, descriptive, and correlational (Bryman 2016) and justification for the design of choice for this study will be argued within that classification. Other forms of classification include longitudinal or cross-sectional survey with a panel or cohort approach. Other designs may include some form of comparative aspect. Parahoo (2014) asserts that it is not always possible or appropriate to use a design that falls into one neat category. Therefore, to effectively design this study to meet the objectives, it was necessary to combine elements from some of these delineated categories.

4.4.3 Classification of quantitative designs

4.4.3.1 Experimental and quasi-experimental design

To conduct true experimental research it is necessary to manipulate an independent variable to see if it has an effect on the dependant variable (Parahoo 2014). Experimental studies are the only research designs that can attempt to establish causal link between variables (Bryman 2016). They investigate cause-and–effect relationships between the independent and dependent variables and in order to control for extraneous variables that pose a threat to a studies' internal validity, they include randomisation, manipulation and control (Parahoo 2014; Bryman 2016). Randomisation means that all participants that entered the study have an equal chance of being assigned to either the experimental or control group using random allocation whereby measured and unmeasured confounding variables would usually be equally distributed between groups. The control group does not receive the intervention and allows for the control of as many study and participant variables as possible, preventing or minimizing the influence of extraneous variable from influencing the outcome of the study. This ensures that the outcome is caused by the manipulation of the independent variable (Bryman 2016).

Quasi-experimental designs are a useful alternative to experimental designs in situations where randomisation is problematic, for example, if a study needed to examine gender differences or in studies whereby it would be unethical to randomly assign people into groups (Field 2013; Parahoo 2014). Due to not having a control group and/or randomisation, it is difficult to make cause and effect inferences in the quasi-experimental approach. As randomisation is not possible, the researcher in the context

of this design usually uses a comparator group rather than a control group (Parahoo 2014).

Whilst experimental studies have the advantage of enabling causal inferences to be made, the experimental or quasi- experimental approach was not appropriate for this study as it was not part of the study purpose to include an intervention. Furthermore, experimental research designs are very often not suitable to study non-linear sociological change (Berwick 2008; Bunniss and Kelly 2010). In social research it is often not possible to manipulate variables, for example, stereotyped views or gender (Parahoo 2014; Bryman 2016) and these were primary variables of interest under investigation in this study. Logistical problems also came in to play as it was entirely beyond the scope of the researcher to either develop or assimilate an IPE intervention at the time of this research. IPE had just begun in this university for three healthcare groups in their third year, and from a practical perspective, it would have been impossible to organise or fit in an intervention within the existing schedules for first/second year students on these six healthcare courses. Rather this study sought to measure the variables of interest without an intervention, enabling examination of these in a natural state of existence (Polit and Hungler 2008). It is hoped that the findings from this study may help with the formulation of hypotheses that could be tested in future experimental research (Parahoo 2014) in order to advance the IPE research agenda in this and in other Higher Education Institutions in Ireland and Europe.

4.4.3.2 Descriptive design

Descriptive studies are useful for generating knowledge about topics whereby little is known. They are focussed on describing the world, usually involving case studies,

observations and surveys (Parahoo 2014). Descriptive data were useful to learn about the study variables and formed the basis for the correlations (Parahoo 2014; Bryman 2016). However, a purely descriptive survey could not meet all the objectives of this study, as whilst useful for exploring and describing concepts or phenomena relating to the variables under scrutiny, this study sought to find associations between these variables and sought to make predictions for readiness to learn interprofessionally.

4.4.3.3 Correlational design

Correlational designs determine if there is a relationship between two or more variables and characterise whether the correlation is positive; whereby the variables co-vary in the same direction, or negative; whereby they co-vary in opposite directions (Bryman 2016). The strength of the relationship in correlational design is measured by a statistical index called the correlation coefficient (Pallant 2010; Field 2013; Bryman 2016). Correlational studies are limited insofar as correlation does not necessarily imply causation, so unlike experimental studies, they lack power to detect causal relationships due to their observational nature that observes the state of the world rather than manipulate it (Polit and Hungler 2008). The researcher can at best conclude the variables may be related. Another problem that the researcher needs to be aware of is when two variables strongly correlate there is the possibility of an unknown random factor or third variable influencing the relationship (Polit and Beck 2017). It is also difficult sometimes to know the direction of the correlation between the two variables when a correlation is identified and an intuitive judgement is necessary to determine the most logical interpretation of the relationship (Polit and Beck 2017).

With these aforementioned limitations noted, a correlational design is very useful to broaden the scope of available topics to study. They can identify relationships between two or more variables, as well as determine how well a variable can predict the presence or absence of another (Polit and Hungler 2008; Bryman 2016). Correlational designs are becoming a popular choice in healthcare research as there are so many areas of inquiry that are not amenable to experimental design (Polit and Beck 2017). The correlational approach was deemed the most suitable for this study as the aim was not to establish cause and effect through control, but rather to seek relationships between the variables and investigate predictability of variables on readiness for interprofessional learning with the view to inform the design of future IPE models. Furthermore, this approach complemented the decision to use survey for data collection as surveys are well recognised as very suitable for and frequently used in correlational studies (Parahoo 2014). Correlational research design can also detect associations to enable the formulation of hypotheses that can be later tested (Parahoo 2014) which, as already mentioned, could be advantageous to plan the direction of future IPE research.

4.4.4 Survey research

Surveys involve the collection of data in standardised form which ensures that every participant in the sample gets the same questions. They refer to a data collection technique whereby the researcher uses questionnaires to collect data from a recognised population, and are deemed very suitable for both descriptive and correlational studies (Parahoo 2014; Bryman 2016). Typically non-experimental in nature, surveys are appropriate to measure and/or explore characteristics, opinions, attitudes and perspectives of a population (Aldridge and Levine 2001; Parahoo 2014; Bryman 2016;

Polit and Beck 2017). Surveys are also suitable for gleaning information about interrelations of variables within a population (Parahoo 2014; Polit and Beck 2017).

The survey approach was chosen because in correlational studies such as this one, surveys are well recognised as ideal for establishing relationships between variables without inclusion of an intervention, and also for correlating demographic data with participants' attitudes or perspectives (Parahoo 2014). Another very important advantage of surveys in the context of this study is the cost effective aspect, whereby data can be quickly obtained from a large number of individuals (Bryman 2016). They are well recognised as a successful way to collect data from an entire census population (Parahoo 2014), and therefore most suitable for this study that entailed a full cohort of first/second year undergraduate student population. This approach ensured quick, efficient acquisition of information from the large body of students at each timepoint.

It is important to note at this juncture, that whilst the survey is a relatively reliable way of determining attitudes of these study participants, one of the main disadvantages of using a survey is that it is dependent on self-reported data, and as such, individuals can be affected by a number of psychological phenomena, notably, social desirability bias (Aldridge and Levine 2001). This means participants may be inclined to give perceived socially acceptable or favourable answers that they expect the researcher would like to obtain. This represented a particular concern given that the researcher is a member of academic staff. It was envisaged that this potential bias could yield readiness for IPE scores that are unreflective of the students' true views and/or a less truthful rating of the attributes or importance of healthcare professionals that were members of the 'out-group' (Taifel 1978). However, with that limitation noted, it is well recognised that in

order to obtain accurate and 'honest as possible data', surveys conducted anonymously are more likely to yield truthful responses than other types of data collection methods (Parahoo 2014; Bryman 2016; Polit and Beck 2017). Hence, the survey approach was chosen, and with careful considerations during data collection as detailed in chapter 5, section 5.9, it was considered the best method of data collection for this study. Furthermore, the survey did not contain sensitive topics which could cause discomfort to participants thus maximising the potential for accurate questionnaire completion (Aldridge and Levine 2001).

4.4.4.1 Longitudinal survey

Surveys generally take the form of longitudinal or cross-sectional (Aldridge and Levine 2001; Floyd and Fowler 2009; Bryman 2016). Longitudinal surveys collect data at one time and then at least one other later time in order to capture any changes that could have occurred, and the data is generally obtained from the same individuals (Aldridge and Levine 2001; Bryman 2016). Cross-sectional studies survey at one time, and generally from different groups of individuals who are often experiencing different stages of a phenomenon under inquiry (Parahoo 2014; Bryman 2016). A longitudinal survey was chosen for this study over a cross-sectional because the latter could only provide a 'snapshot' at one specific point in time and a very important objective of this study was to identify changes in participants' perspectives over the course of one year. Longitudinal research is currently lacking and has been strongly recommended in the IPE literature to ascertain how professional identity evolves (Hind *et al.* 2003; Coster *et al.* 2008), and to understand the tenacity and resilience of stereotypes given that they can so negatively impact on IPE (Michalec *et al.* 2013). This feature of the study was essential to ascertain if the first year of undergraduate training is an appropriate time to

introduce a shared learning strategy for healthcare students, given the unresolved debate about best timing for IPE in undergraduate healthcare courses. The one year timeframe was chosen partly because of time constraints for timely study completion, but was also because there is evidence to show that the biggest change in professional identity can occur between the first and second year thought to be due to the reality of practice placements (Coster *et al.* 2008). Longitudinal studies are normally considered less economical, less time efficient and therefore are not as commonly used as cross sectional designs (Bryman 2016). However, in the context of this study, access to the target population was unproblematic given that the researcher was a member of staff in the institution and very little costs were envisaged to incur.

Of the two types of longitudinal study that is panel and cohort, cohort was the appropriate design of choice because the study needed to investigate the same participants over the time period (Parahoo 2014). Cohort studies collect data from people who have similar characteristics (Bryman 2016) such as these undergraduate healthcare students from the same institution. Panel surveys collect data on two or more occasions from various sources, such as, people, organisations etc. and may not follow the same participants (Parahoo 2014) and as such was not an appropriate approach for this study.

It is important in longitudinal research to carefully decide the intervals for data collection. These should be based on the best times to capture the phenomenon under investigation to best address the study objectives (Parahoo 2014). An interval of one year between the data collection points was decided because the phenomenon under investigation was about the potential for early implementation of IPE in the

undergraduate healthcare courses. In their four year longitudinal study, Coster *et al.* (2008) found that the principal change in scores on both readiness for shared learning and strength of professional identity occurred between measurement at course commencement and on return to the second year of study. It was hoped that the gap in the literature about the most appropriate time to introduce IPE could be someway addressed with insights gleaned from the perspective of this institution. The researcher endeavoured to achieve this through the measurement of students' strength of professional identity, their readiness for shared learning and identification of negative stereotyped views towards other professions. The data could then be compared between timepoints for changes that may have occurred during the first year thus indicating if the first year is a suitable time from the students' perspective to implement IPE.

Longitudinal surveys are not without their difficulties, with attrition bias probably representing the greatest challenge for the researcher. Loss of participants can pose a serious threat to the external validity of the study with the subsequent inability to draw valid conclusions (Barribal and While 1999; Parahoo 2014; Bryman 2016). On that basis, it was of paramount importance for the researcher to reflect carefully on the best possible data collection procedure to try to maximise response rates. The practical step by step measures undertaken to minimise this problem are detailed in the methods chapter 5, section 5.10.2.

Another potential disadvantage of longitudinal studies of the cohort variety is the 'cohort effect' (Parahoo 2014; Bryman 2016). This factor needs to be taken into consideration when drawing conclusions from the data. A cohort by definition relates to a group of people who share a common identity of some sort. The groups of students

in this study share many characteristics, such as, time of course entry, age, healthcare group etc. These are likely to exert influence over the attitudes and beliefs of the study participants as they share common experiences involving institutional culture, the hidden curriculum, and a variety of social situations (Morrison *et al.* 2003; Mu *et al.* 2004; Freeth *et al.* 2005). In the context of this study, shared experiences were a phenomenon of interest and potentially important to help explain changes in attitudes brought about by informal IPE experiences (Freeth *et al.* 2005). Bryman (2016) notes that the cohort effect is usually problematic in research studies which need to gather data over long extended periods of time, and on that basis it was hoped that any effect would be minimal given that data collection was completed in a relatively short one year time frame. The potential for cohort effect, however, needs to be noted as a limitation.

4.4.5 Comparative aspect of study design

A further component was employed in this research design that entailed the inclusion of a non-healthcare comparator group. A 'comparison', or 'comparator' group, is the term that is generally used in place of 'control' group, when research does not involve an experimental design (Polit and Beck 2017) and this is the terminology used in this study. Surveys often incorporate some form of comparison which entails using all, or mostly identical methods to examine two contrasting cases or situations (Bryman 2016; Polit and Beck 2017). McFadyen *et al.* (2010) note that in general there is a marked dearth in the IPE literature both in experimental and non-experimental designs which incorporate a control or comparison group to help understand the findings. Comparative designs embody the logic of comparison whereby it is thought that social phenomena can be better understood if they are compared to a minimum of two

contrasting cases, situations, characteristics, events, policies or practices etc. (Parahoo 2014; Bryman 2016). Hence they are useful to ascertain if a phenomenon under study is associated with a particular context or group of individuals, and as such can add strength to a survey regarding interpretation of the findings.

In order to gain further insight into the phenomena under investigation and explore if the students' perspectives were possibly associated with being a student in a healthcare group from a Faculty of Health Sciences, the non-healthcare comparator group was selected from an alternative Faculty for comparative purposes. Investigating comparisons between six healthcare professional groups was a primary objective for this inquiry so the study by its very nature constituted a comparative component (Parahoo 2014). However, the use of the non-healthcare comparator provided an alternative angle through which to draw conclusions from the data. This is in recognition that whilst there are six individual healthcare groups with their own individual professional identities, they also comprise a single healthcare group with a common identity that is 'healthcare student' (Tajfel and Turner 1979). Hence, it was considered useful to include a non-healthcare comparator from an alternative Faculty within the institution to ascertain if changes were unique to the healthcare students studying together within the same Faculty. This comparative component was not, or needed to be, the primary focus of the study (Polit and Beck 2017). It was expected to, as Polit and Beck (2017) suggest, provide a context for comprehending the findings.

Comparative studies can become quite complex in terms of data analysis (Bryman 2016) and this study was not without logistical challenge. Whilst a few items on the Readiness for Interprofessional Learning Scale (RIPLS) were amenable for comparison

between the healthcare and non-healthcare groups, the underlying construct for measurement that is, readiness for IPE measured by the composite scale scores, did not logically lend itself to comparison between these two groups. Nevertheless, the comparator had value for comparison on variables relating to strength of professional identity, importance/value attributed to the presence of the different healthcare professions on the IPW team, and professional stereotyping. These variables were then explored for group comparisons as they related to changes between the two timepoints and, as such, provided useful information about how the healthcare students' attitudes changed by comparison to those not part of this group.

The other issue which posed a dilemma for the researcher related to the choice of comparator and much consideration was given to choosing a suitable comparator group. It was essential to obtain data that could provide a sufficient comparison to the healthcare participants (Bryman 2106). On that basis it was essential to recruit a comparator that was not part of the Faculty of Health Sciences. Originally the group of choice was a cohort of students from the Faculty of Engineering, Mathematics and Science undergoing a Bachelor degree in mathematics. However, on discussion with peers and supervisors at the early design study phase, it was agreed this group were possibly too far removed from the realm of healthcare and possibly too disparate from the healthcare cohort. A group with an orientation towards care of people was considered the preferred option. It was subsequently agreed that a cohort from the Faculty of Arts, Humanities and Social Sciences could best provide a suitable comparator. Following much deliberations between researcher and advisory committee, a cohort of Bachelor of Social Studies students became the comparator of choice because it was felt these students had an appreciation for the issues relating to both

health care and collaborative working, but at the same time belonged to a different Faculty and did not share the same experiences as the healthcare students. However, it is essential to note as Bryman (2016) contends, any differences observed between groups are not necessarily resulting from the distinguishing features between groups.

4.5 Conclusion

Quantitative and qualitative research methods differ in terms of the role and assumptions of the researcher and how the research should be conducted to address the inquiry. How a researcher sees the world will influence how the research is undertaken to discover truth about phenomena. This chapter has detailed the philosophical and theoretical components underpinning this study. It has illuminated the worldview held by the researcher which informed the study design. The next chapter presents the methods, detailing the specific and logical steps taken to address the study aim and objectives.

Chapter 5 Method

5.1 Introduction

This chapter presents the research methods employed to address the study purpose and argues the rationale for the decisions and procedures undertaken throughout the operationalisation of the study. Firstly, a review of the study aim and objectives with models linking the objectives to the research methods employed to address them is provided. The ethical considerations are explored and any issues that needed to be considered are illuminated. Subsequently this chapter is divided into several sections which detail the step-by-step processes that took place before, during and after data collection relating to research site and access, population, sample and sample size, inclusion and exclusion criteria, research instrument, pilot study, data collection procedure and data management. The mechanisms to ensure validity and reliability are explained. Data analysis methods are rationalised and the testing of assumptions for their suitability are detailed. This chapter concludes with reflections about choosing the most appropriate methods to best address the study purpose.

5.2 Review of study aim and objectives.

This study aimed to investigate the attitudes of undergraduate healthcare students in an Irish university towards interprofessional education and working at course commencement and at the beginning of the second year, in order to inform the

development and implementation of interprofessional education interventions. The specific study objectives (OBJ) are visually mapped on the following models to the survey scales, variables measured and statistical procedures[22]:

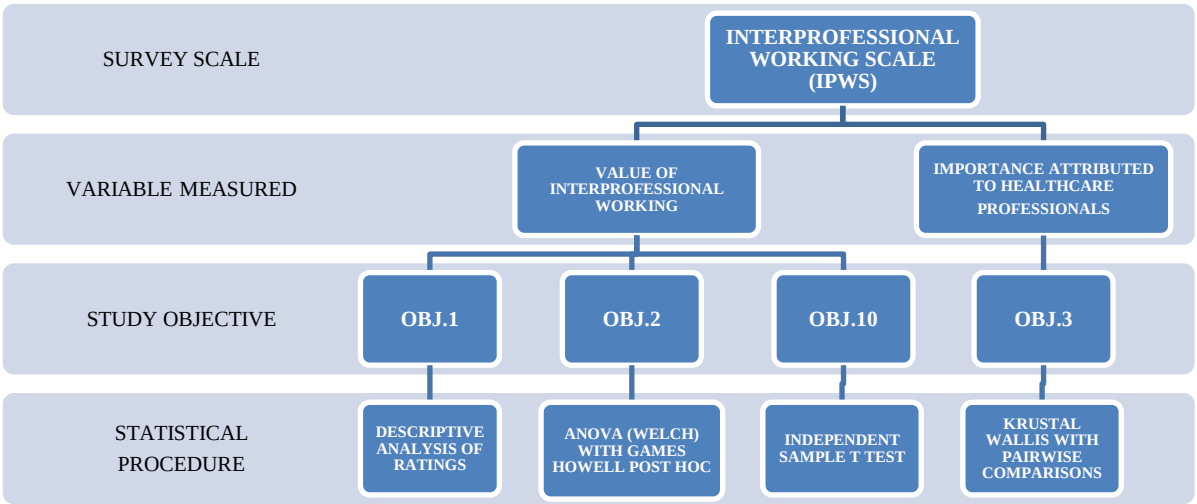
OBJ.1. To ascertain the value undergraduate healthcare students attribute to interprofessional working.

OBJ.2. To examine differences in value attributed to interprofessional working between healthcare student groups and the comparator group.

OBJ.3. To examine if undergraduate healthcare students and comparator group attribute equal importance to the presence of different healthcare professions on the interprofessional working team.

OBJ 10. To ascertain if there are gender differences on value attributed to interprofessional working.

Figure 5.1 Model 1 mapping study objectives 1, 2, 3 & 10 to research methods

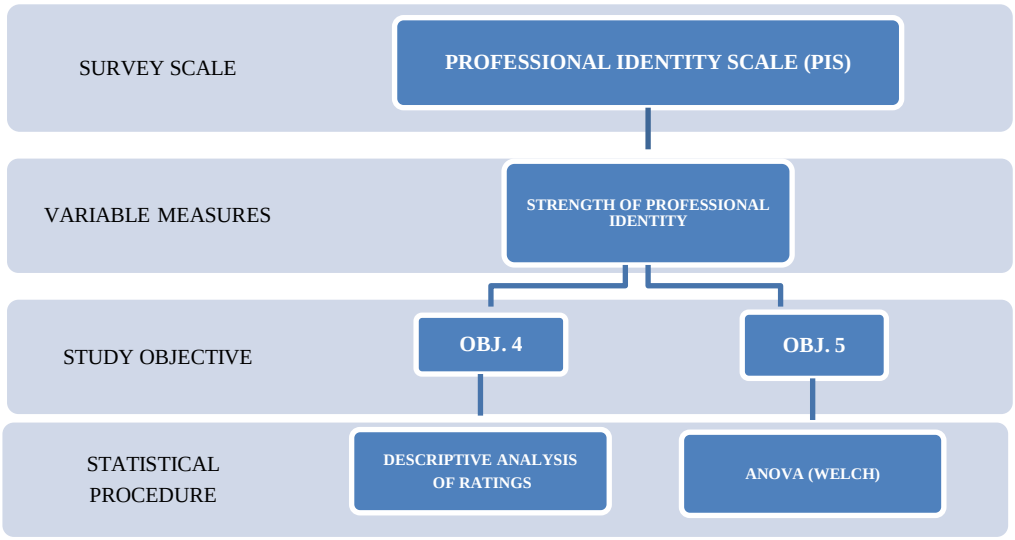


[22] Models 1 to 7 are integrated into figure 7.3, chapter 7, showing progression of study from literature review themes, objectives, statistical procedures, to findings and conclusions.

OBJ. 4. To investigate the strength of professional identity among undergraduate healthcare students.

OBJ. 5. To determine if there are differences in level of professional identification between the healthcare student groups.

Figure 5.2 Model 2 mapping study objectives 4 to 5 to research methods

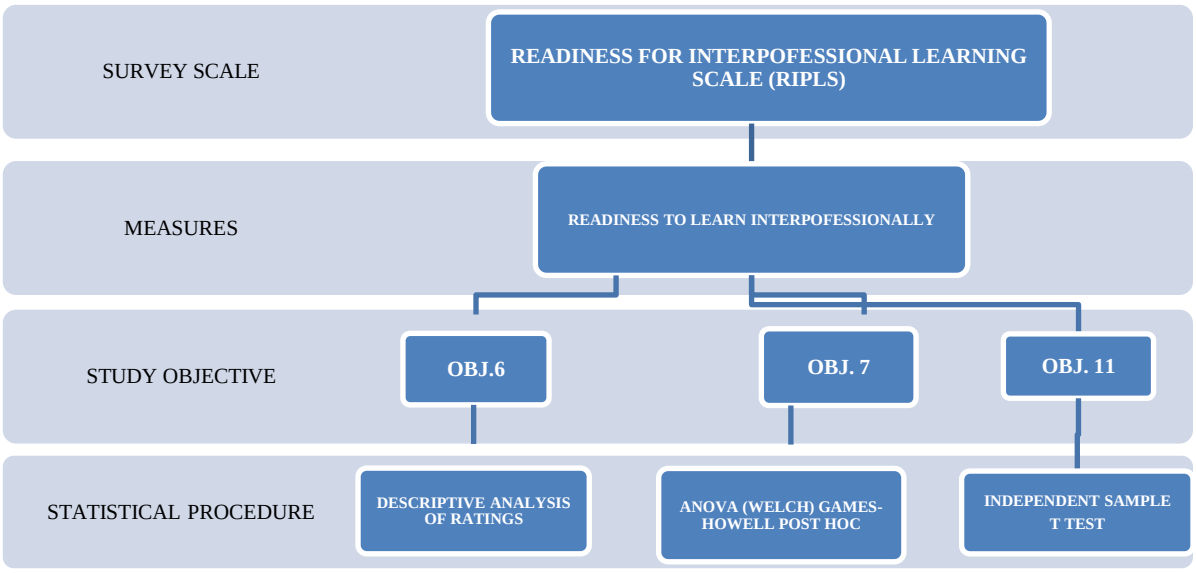


OBJ. 6. To measure undergraduate healthcare students' readiness for interprofessional learning.

OBJ. 7. To determine if there are differences in readiness for interprofessional learning between the healthcare groups.

OBJ 11. To ascertain if there are gender differences on readiness for interprofessional learning.

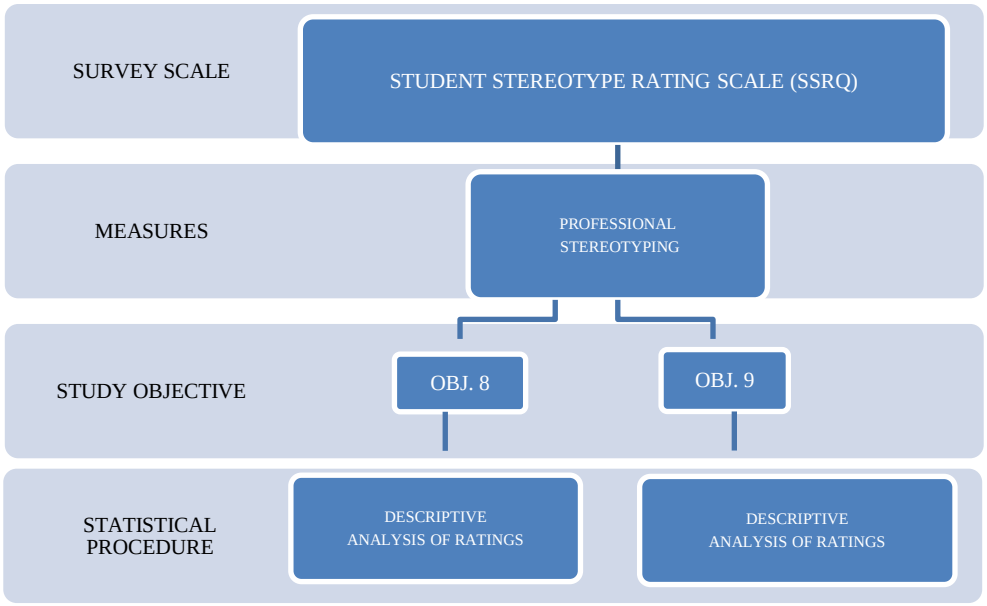
Figure 5.3 Model 3 mapping study objectives 6, 7 & 11 to research methods



OBJ. 8. To investigate the existence of stereotypes among the undergraduate healthcare students.

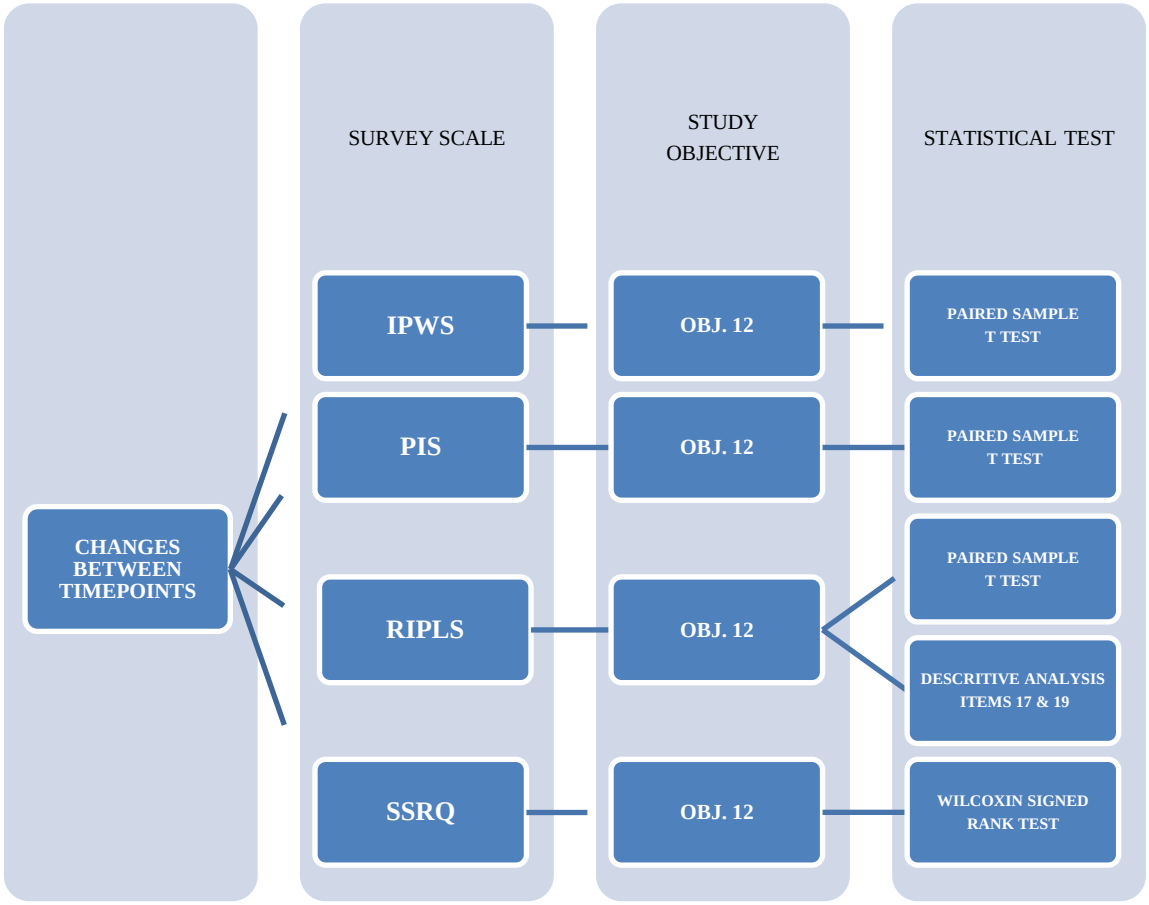
OBJ. 9. To examine differences in stereotyped views between healthcare student groups and the comparator group.

Figure 5.4 Model 4 mapping study objectives 8 to 9 to research methods



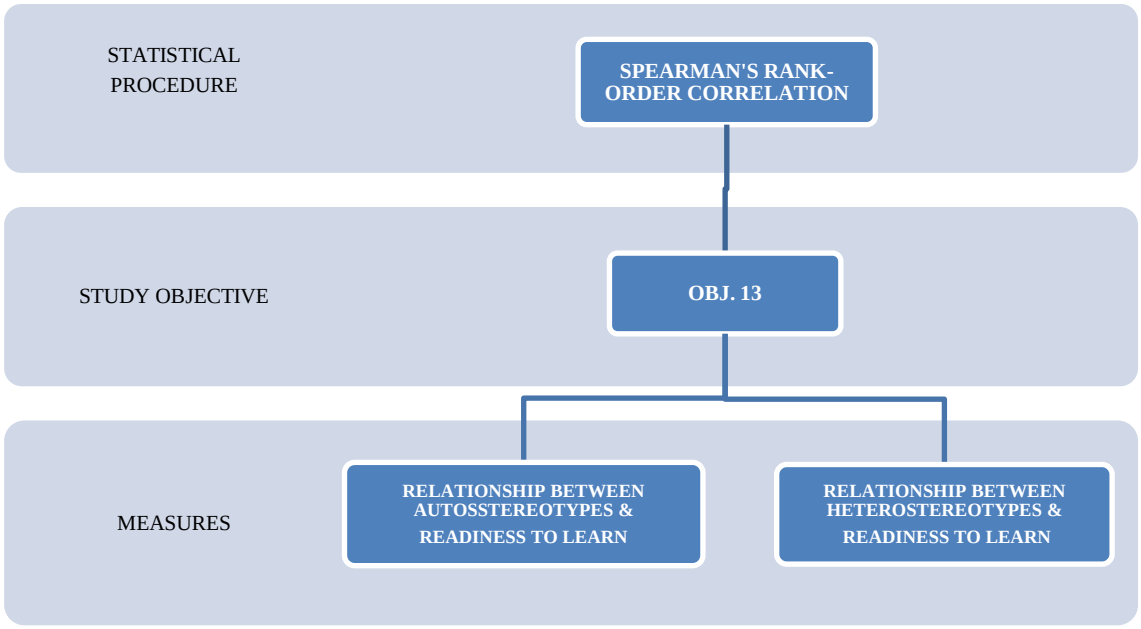
OBJ. 12. To investigate changes over a 12 month period from course commencement.

Figure 5.5 Model 5 mapping study objective 12 to research methods



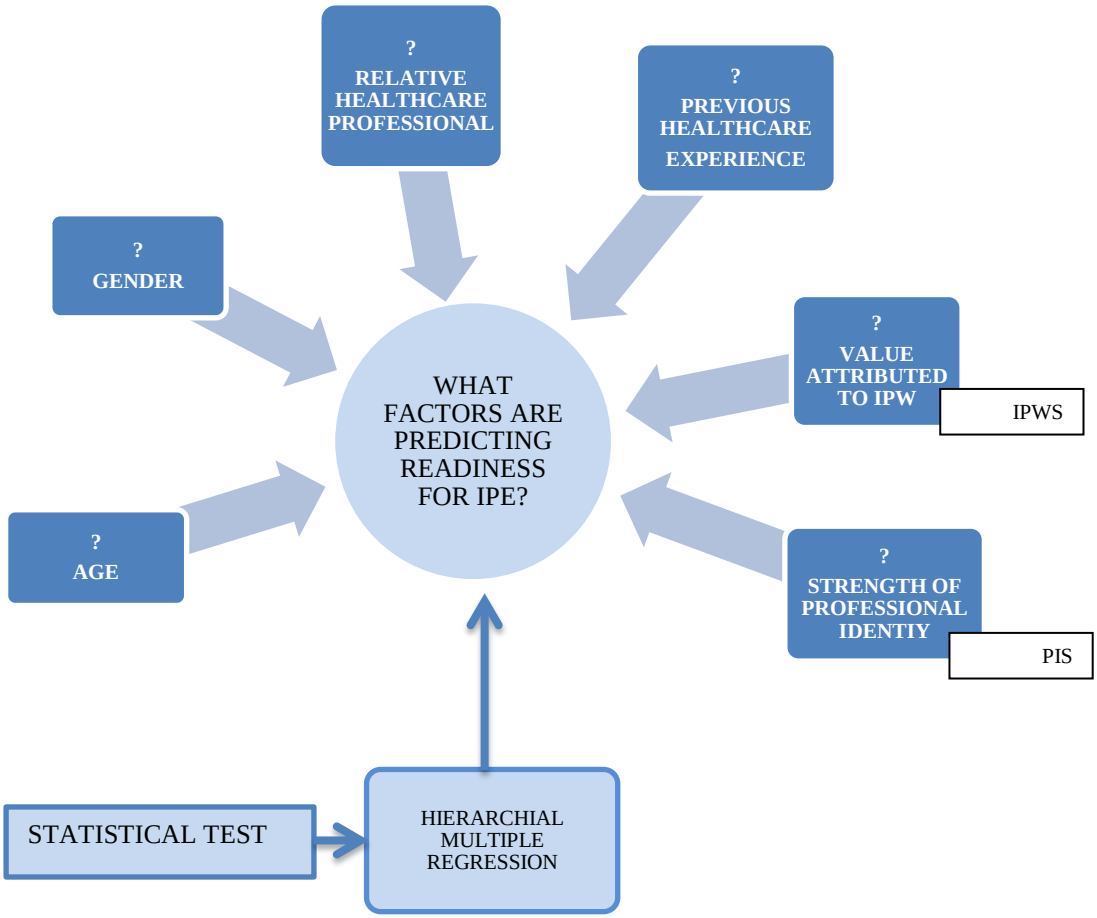
OBJ. 13. To investigate relationships at baseline between stereotyping and readiness for interprofessional learning.

Figure 5.6 Model 6 mapping study objective 13 to research methods



OBJ.14. To ascertain predictive ability of strength professional identity, value attributed to IPW and learner characteristics on readiness for interprofessional learning at baseline.

Figure 5.7 Model 7 mapping study objective 14 to research methods



5.3 Ethical considerations

A critical component of all research dictates that it must be conducted ethically in line with international ethical standards. There are potentially ethical implications at every stage of the research process (Parahoo 2014) and these require careful consideration and continuous reflective practice on the part of the researcher. This study conformed to the international ethical standards of the Declaration of Helsinki (World Medical Association 2013), was the last date that these guidelines were reviewed and updated the Nuremberg Code (1949), the Belmont Report (The National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research 1979) and the ethical research guideline published by An Board Altranais (2014) now known as the Nursing and Midwifery Board of Ireland (NMBI). Permission to conduct this study was sought and granted in September 2010 from the Ethics Committee of the Faculty of Health Sciences, Trinity College Dublin. This section details how this study upheld the ethical principles of respect, beneficence, non-maleficence and justice (Beauchamp and Childress 2009).

5.3.1 Justice

The principle of justice is concerned with equality, fairness and privacy (Beauchamp and Childress 2001) and in the context of this study is largely an all-encompassing principle which is reflected in the way the research study took account of the principles of respect, beneficence and non-maleficence.

5.3.2 Respect

Respect for individuals incorporates respect for autonomy, the right to self-determination and the right to informed consent (Lobiondo-wood and Haber 2014).

5.3.2.1 Respect for autonomy and self-determination

These concepts refer to the recognition that the person has the right to choose to participate in the study (Polit and Beck 2017). The researcher was sensitive to the fact that the undergraduate students may feel compelled in some way to participate, given that the researcher is a member of academic staff. There was also the possibility that they could fear consequences relating to their academic work. To uphold the right to autonomy the students were informed through a participant information sheet (appendix 3), the course-co-ordinator and then through the researcher before data collection, that they had the absolute right without consequence to not participate in the study. They were given the option to withdraw from the study and exit the classroom. Anonymity and confidentiality of data was reiterated and students were guaranteed that participation in the study could have no effect on or influence their healthcare training or course outcome. Completion and return of the questionnaire was taken as consent to participate in the study. To protect participant privacy and confidentiality, the survey instrument used a unique identifier code which ensured anonymity and confidentiality for all participants. Students were explicitly informed not to put their names on the questionnaires. Data were collected and stored in keeping with the Data Protection Act (Government of Ireland 2003). Following data collection, all hardcopy data were stored in locked cabinets in a secure location. Five years following completion of the study all hardcopy data will be destroyed.

5.3.2.2 Right to informed consent

Full disclosure was an essential pre-requisite in order for the participants to exercise their right to autonomy, self-determination and obtaining informed consent. Informed consent necessitates full disclosure on behalf of the researcher and potential participants

must fully understand the study aims, objectives and purpose (Burns and Grove 2011). On that basis the students were given clear, unambiguous, verbal and written information about the study through the information flyer and then again in person by the researcher. As this was a longitudinal survey, consent to participate was seen as a process rather than an outcome and students were informed that they had the absolute right not to complete the questionnaire at the second data collection timepoint.

5.3.3 Beneficence and non-maleficence

Non-maleficence encompasses the concepts of protection and obligation and avoidance of harm or injury to an individual (Beauchamp and Childress 2001). Beneficence dictates that the researcher must on all occasions do good to people and maximise on positive outcomes for individuals and society (Beauchamp and Childress 2001; Polit and Beck 2017). These mutually dependent principles involve protection and defending rights of the individual. In this study there was no direct benefit to the participants. However there was the potential of improving future educational strategies to involve shared learning that could engender better collaboration and teamwork between future healthcare professionals. This could be viewed as a potential benefit to society bringing about improvement of quality patient care. There was no likelihood of emotional, psychological, or physical risk to the participants, as this study entailed an examination of views and attitudes without any type of intervention. Likewise, there was no possibility that the participants could be harmed by the information they provided on the survey questionnaire given that anonymity was assured

5.4 Research site and access

This study took place in one of the largest Higher Education Institutions in the Republic of Ireland. The site was selected primarily on the basis that it uniquely provided courses for all frontline professions in healthcare, and ran courses for the healthcare disciplines under study. Furthermore, the researcher is a member of staff concerned with the establishment of IPE for healthcare students in the university. This is primarily to produce healthcare graduates who can work collaboratively on IPW teams. A single institution was the preferred choice as opposed to multiple sites owing to differences in available courses between institutions. Furthermore, the use of a single site limited potential confounding variables relating to differences in curriculum, culture, and ethos. Access was sought and granted by the heads of the Faculty of Health Sciences and the Faculty of Arts, Humanities and Social

5.5 Population and sample

5.5.1 Target population

A population relates to a group that shares the same characteristics (Polit and Beck 2017) and the target population under investigation in this study included one cohort of healthcare students from six healthcare disciplines of dietetics, medicine, nursing, occupational therapy, pharmacy and physiotherapy in the Faculty of Health Sciences. These six healthcare disciplines were included as they were regarded as most representative of frontline professionals. Therefore, the disciplines of dentistry, midwifery, and radiography were not included in the study. The discipline of speech and language therapy was considered for inclusion but there was no response to the

initial invitation to participate. A comparison cohort of social studies students was included in this study for reasons detailed in section 4.5.5.

A population can be surveyed by census or by a sample and in some situations it is feasible and essential to study an entire population if there are relatively small numbers of individuals (Bryman 2016). It was feasible to carry out a census survey as the total cohort of students was a manageable size and accessible. Any advantages of using a sample in preference to a census in terms of cost and timely data collection (Parahoo 2014) was not a consideration in this study, as the data were collected by the researcher in person at one scheduled period on the timetable per group, thus allowing fast availability of data with no added cost. With a census sample approach there is less likelihood of researcher bias than with sampling procedures (Barribal and While 1999; Bryman 2016). There is also greater representativeness of the sample while at the same time minimising non-coverage bias (Barribal and While 1999). This was most advantageous for this study as a census enabled collection of a larger quantity of data from the smaller groups included in the study.

5.5.2 Inclusion and exclusion criteria

The inclusion and exclusion criteria are partially self-explanatory. Participants had to be first year undergraduate students partaking on one of the six healthcare courses that is dietetics medicine, nursing, occupational therapy pharmacy or physiotherapy from the Faculty of Health Sciences in the Irish university selected for the study. The comparator group participants had to be first year undergraduate students partaking in the social studies course from the Faculty of Arts, Humanities and Social Sciences in the same university. The healthcare profession students from the Faculty of Health Sciences also incorporated dentistry, midwifery and radiography students, but these

were excluded as they were not considered frontline healthcare professionals. At the second data collection timepoint, the same students returning to study in second year were invited to complete the questionnaire and the questionnaires were paired using the identifier code to ensure they matched. Students who did not complete the questionnaire at both timepoints were not included in the longitudinal analysis.

5.5.3 Sample size

The anticipated population size was based on the number of students that registered on the six undergraduate healthcare programmes and on the social studies (comparator group) programme. The total population of first year students eligible to participate in the study was 678 healthcare students and 40 social studies students. The total number that successfully completed the survey at T1 was 534 healthcare students representing a response rate of 78.6%, and 38 social studies students representing a 95% response rate. The breakdown of healthcare disciplines responses at T1 comprised; 25 dietetic, 152 medical, 214 nursing, 39 occupational therapy, 66 pharmacy and 38 physiotherapy students.

There were 411 questionnaires retrieved but 49 of these had to be discarded as they were either not completed or could not be matched to the original. The inability to match those questionnaires was likely due to either non-adherence to the unique identification code by the respondent, or completion of the survey at T2 by respondents who did not complete at T1. At T2, 362 healthcare students and 25 comparator group students in total successfully completed the questionnaires and were eligible for the longitudinal analysis. The course coordinators were asked to distribute the

questionnaires again within a week following data collection in the hope that more individuals would respond, but no further questionnaires were forwarded.

5.6 Research instrument

Research data was collected at both timepoints, i.e. within two weeks following course commencement and then 12 months later, from the healthcare and non-healthcare students using a self-completion survey questionnaire consisting of four likert scales, demographic items, and open-ended questions (Appendix 4 and 5). Different scales were used as they can yield a bigger picture of the issues in question (Hartley 2013). This study is unique insofar as these four scales have not previously been used together in any study. A questionnaire was appropriate for this study as they are an effective way to measure knowledge, attitudes or behaviour; are well recognised as an efficient, cost effective way to collect data in quantitative surveys, and can provide clear easy to compute data to facilitate input and analysis (Robson 2011; Parahoo 2014; Bryman 2016). They can also ensure anonymity and are very conducive to group administration by the researcher (Robson 2011; Bryman 2016). This was an important facet of the data collection process because, in order to maximise response rates and to combat the problem of attrition in longitudinal surveys, the researcher chose to self-administer the questionnaire and meet the students face-to-face in the process, as opposed to collecting the data online or use web-based administration of questionnaires, all of which are reported to yield less satisfactory response rates (Barribal and While 1999). The questionnaire used simple language without any jargon and all scales were tick box and user friendly so that completion of the entire questionnaire required approximately 20 minutes, thus minimising participant burden and helping to maximise response rates (Oppenheim 1992).

To address the purpose of this study, survey instruments were needed that could yield information about the importance/value students attribute to healthcare professionals on the interprofessional working team, measure students' strength of professional identity, measure students' readiness to learn interprofessionally and ascertain students' views of their own and other healthcare professions on professional attributes. As surveys using questionnaires are most suitable for gleaning information about interrelations of variables within a population (Polit and Hungler 2008), they were ideal to facilitate examination of correlations between variables, and identify predictors of readiness to learn interprofessionally.

The four scales that emerged as most suitable from the review of the literature were the Interprofessional Working Scale (IPWS) (While and Barriball, 1999); Professional Identity Scale (PIS) (Brown *et al.* 1986); Readiness for Interprofessional Learning Scale (RIPLS) (Parsell and Bligh 1999; Mc Fadyen *et al.* 2005) and the Student Stereotypes Rating Questionnaire (SSRQ) (Hean et al. 2006a). Following discussions with the supervisory team and a panel of experts, these scales were deemed suitable to address the purpose of this study. The PIS, RIPLS and SSRQ have been widely used in IPE research involving undergraduate healthcare students, are reported as valid and reliable for this population, and correlate well together (Hind et al 2003). They are also well recognised as effective to detect changes over time (Hind et al 2003; Coster et al. 2008; Ateah et al. 2011). One of the disadvantages of questionnaires using likert scales is that they 'force' an answer that may not entirely represent the participant viewpoints (Oppenheim 1992). On that basis open-ended items were added to enable participants to expand on their beliefs.

5.6.1 Interprofessional Working Scale

The Interprofessional Working Scale (IPWS) (Appendix 4) is a short likert scale comprising six interprofessional working items that were originally used in a study by While and Barriball (1999) exploring views of qualified and unqualified nurses about interprofessional working teams. This scale rates participants' views on how important they feel the contribution of a health professional group is to the team in healthcare. In this study the disciplines to be rated on this scale were representative of the courses upon which the student population were enrolled, and the participants could rate the six professions on 5 points ranging from very important to very unimportant. The rationale for gleaning this information is threefold; there is growing compelling evidence to show that effective IPW can reduce patient complications and death (Weller *et al.* 2014), teamwork is more effective if there is mutual respect with all healthcare team members valued equally ((Hall 2005; Baldwin 2007), and educational interventions targeted at improving teamwork and communication are now considered a critical part of undergraduate training (Weller *et al.* 2014). The evidence that emerged from the literature review suggests that the views and attitudes of students towards IPW can affect team dynamics (Curran *et al.* 2008) and IPE outcomes (Reeves *et al.* 2009) and it would be important for educators to acknowledge the nature of these when facilitating shared learning.

Early discussions with the supervisory team included the researcher that was instrumental in the development of this scale. This proved very helpful in the decision to use the composite scale scores as a possible means to indicate the value participants attribute to teamwork between these six disciplines. These items were also suitable to spotlight differences in perceptions between healthcare groups and between the

healthcare and non-healthcare comparator group in how they rate professions for importance on the healthcare team.

5.6.2. Professional Identity Scale

Professional identity enables students to think, feel and behave like a member of their profession (Tajfel and Turner 2001; Adams *et al.* 2006) and, as the literature review highlighted, impacts on how individuals feel about shared learning and their ability to function on interprofessional teams (Coster *et al.* 2008). The Professional Identity Scale is consistent with Social Identity Theory as it measures strength of professional identity within groups and has been tested in many IPE studies (Adams *et al.* 2006; Coster *et al.* 2008). The Professional Identity Scale (PIS) was originally developed by Brown *et al.* (1986) to measure group identification and has since been widely used among researchers in the IPE community to study development of group identification among undergraduates and to gain understanding of the effect of group identification on attitudes towards IPE. This data has informed the unresolved debate around the best timing of IPE interventions. The PIS comprises 10 likert scale items in the form of statements; five worded positively and five worded negatively, which can be rated on 5 points from never to very often (Appendix 4). Five negatively worded items are reversed coded prior to statistical analysis. Possible scores range from ten to fifty with higher scores indicating a strong, positive professional identity.

This scale was deemed suitable for the purpose of this study as other studies have successfully used it to measure strength of professional identity to ascertain suitable timing for IPE in an undergraduate programme (Hind *et al.* 2003) which is an important objective of this study. It has also been useful to determine if strength of professional identity can affect how students rate their own professions on professional attributes

(Hind *et al.* 2003; Hean *et al.* 2006a) and has been correlated successfully with the RIPLS (Coster *et al.* 2008; Hind *et al.* 2003) and the SSRQ (Hind *et al.* 2003).

5.6.3 Readiness for Interprofessional Learning Scale

The Readiness for Interprofessional Learning Scale (RIPLS) was originally developed by Parsell and Bligh (1999) to measure the readiness/willingness of students for IPE (Appendix 4). This scale was selected for use in this study to measure readiness among the healthcare disciplines in this institution, and to assess differences in readiness between the six healthcare student groups. Parsell and Bligh (1999) reported a high internal consistency reliability of the overall scale at 0.9 and high content validity. However, the authors noted that the pilot sample was small (n=120) and purported that a larger sample would be likely to produce more valid results. On that basis McFadyen et al (2005) investigated the possibility of improving the reliability of the RIPLS scale for use with undergraduate healthcare students. Content analysis on the original 19 items resulted in a more stable subscale model with four subscales that demonstrated improved internal consistency. Hence, the revised version of the RIPLS was selected for use in this study.

The revised RIPLS has been widely used, translated into different languages and used in varying cultural contexts (Mahler *et al.* 2015). It has been used in IPE studies from Europe, the United States, United Kingdom, Australia, Canada and more recently Asia and the Republic of Ireland. The scale comprises four subscales with 19 five-point likert scale items with a composite score ranging from 19-95. High scores indicate positive attitudes to IPE i.e. 95 indicates the student "strongly agreed" with IPE, while the least possible score of 19 indicates the student "strongly disagreed" with the concept of IPE. The RIPLS 4 subscales encompasses as follows:

(1) teamwork and collaboration (items 1-9, total possible score=45), a subscale which rates students' willingness to learn with and about other professions. High scores indicate a willingness to learn, share skills, develop positive interactions and cultivate an educational environment of respect and trust with other professionals;

(2) negative professional identity (items 10-12, total possible score=15), a subscale which examines students' negative views of interprofessional learning. This subscale was reverse-scored in keeping with McFadyen *et al.* (2005), (2006) and (2010);

(3) positive professional identity (items 13-16, total possible score=20), a subscale which examines if students have a positive tendency toward shared learning with other disciplines. The items on subscales 2 and 3 are suggestive of a conflict between a desire to retain professional identity through uni-professional learning, and a readiness to share knowledge through an interprofessional approach;

(4) roles and responsibilities (items 17-19, total possible score=15) a subscale[23] with three items that identify an unclear or distorted perception of what one's roles might be as a professional. The underlying premise of this subscale centres on a traditional belief that some roles are subservient to others. This subscale was reverse-scored as recommended by McFadyen *et al.* (2006), and in accordance with their 2010 studies (McFadyen *et al.* 2010).

[23] It needs to be noted at this juncture that since the adoption of this measure for use in this study, on-going problems with the stability of the roles and responsibilities RILPS subscale have been revealed in some studies, with Cronbach's alpha values reported below 0.43, leading some researchers to report the entire scale subscale measures rather than individual subscales (King *et al.*, 2012; Mahler *et al.* 2015).

5.6.4 Student Stereotypes Rating Questionnaire

The Student Stereotypes Rating Questionnaire (SSRQ) is a nine item scale developed by Hean *et al.* (2006a) that was adapted from an original scale by Barnes *et al.* (2000). It was designed to identify professional stereotyping among health and social care students and aims to elicit information about how healthcare students rate their own and other professional groups on nine attributes of academic ability, professional competence, interpersonal skills, leadership ability, ability to work independently, ability to be a team player, ability to make decisions, practical skills and confidence (Hean *et al.* 2006a and b). This instrument uses a five point likert scale with a score of one indicating a rating of 'very low', to a score of five indicating a rating of 'very high' for each professional attribute.

The SSRQ was used in this study to explore stereotypical views that healthcare students may hold for their own (autostereotypes) and other healthcare groups (heterostereotypes), in order to identify if and how professional stereotyping correlates with readiness for shared learning, and to illicit information as to whether stereotyped views changed during the first year of their healthcare courses. To assist with understanding if such views were unique to healthcare students, the non-healthcare group was used for comparison purposes.

5.6.5 Demographic data

Items collecting demographic data relating to age, gender, ethnicity, background education and previous healthcare experience were collected to yield information for correlation purposes.

5.6.6 Open-ended questions

A disadvantage of survey questionnaires using likert scales is that they do not allow for expansion of thoughts and may not entirely represent the participants' viewpoint (Oppenheim 1992). Therefore to maximise on the potential of the survey, a number of open-ended items were included in the questionnaire to enable participants to expand on their beliefs and to corroborate the survey data. These were designed to enable students elaborate on their general feelings about learning with other healthcare students, give an indication of what stage they felt IPE should be included in their courses, and to explain if and why their views about shared learning could have changed over the course of the first year of study.

There are a number of factors to take into consideration when creating a survey with open-ended questions. The way a question is phrased can have a significant influence on the quality of participant responses and subsequently on the data. These questions were carefully designed to complement the closed ended questions in order to glean a 'bigger' picture and reduce the risk of bias due to potential misinterpretation of the survey questions. It was important in the first instance to be absolutely sure what information was required as poorly worded open-ended questions can lead to an unsatisfactory response (Bryman 2016). The use of optional additional text fields provided the opportunity for the participants to address sub-questions. It was important to keep these optional so not to extend the survey time (Oppenheim 1992).

It was important to use this qualitative component in order to maximise the amount of possible answers without assigning any limits on the response (Bryman 2016). This means the participants could voice anything they felt relevant or desired the researcher to discover. Ultimately this could mean that something unique or unexpected was more

likely to arise among the survey responses. IPE and the concerns relating to attitudes towards learning with other healthcare professionals is a complex issue and complex issues require adequate responses. The constraints of a likert scale or a forced 'yes or no' answer can limit explanations thus rendering the data limited in its ability to explain the phenomena under investigation (Oppenheim 1992; Bryman 2016; Polit and Beck 2017). A fundamental reason for including the qualitative component was to ascertain if students felt they experienced any IPE during the first year. The medical and physiotherapy students took part in a joint community case study and it was hoped that some insights about that experience could be gleaned from these students.

5.7 Validity and Reliability

The PIS, RIPLS and the SSRQ have been well validated and have well recognised psychometric properties. The IPWS had no reported validity or reliability from previous use. Validity and reliability for all scales were considered for this study and are discussed in this section.

5.7.1 Validity

5.7.1.1 Face validity

Face validity was sought through the administration of these questionnaires to two colleagues and four undergraduate students who were not involved in the study. All individuals agreed that they could understand the questions and items, and what the IPWS, PIS, RIPLS or SSRQ scales were measuring. No items were deemed to be irrelevant or too difficult to comprehend. A fifth scale was originally included on the

questionnaire called the Role Perception Scale which was designed to assess students' perceptions of the role of other professionals (Mackay 2004). However, this was excluded from the study following the recommendations made by these experts due to difficulties with comprehension of some items, and the extra time it would take to complete. It was envisaged that inclusion of this scale would result in a lengthy questionnaire, and the time it would take to complete could potentially deter the participants from completing what were considered more critical components in the questionnaire.

5.7.1.2 Content validity

Content validity can be established through use of the content validity index and/or through judgement by a panel of experts (Parahoo 2014). In this study this form of validity was sought through five academic experts with an established background in healthcare education. Four of these worked in the institution and had direct experience and knowledge of the topic. The fifth person had much expertise in both clinical and academic healthcare education and had an established background in IPE and IPW research. The PIS, RIPLS and SSRQ were judged as having enough items to effectively measure the phenomenon of interest. Some concern arose as to whether there were sufficient items on the IPWS to determine how important respondents rated teamwork among healthcare professionals. However, this scale was deemed useful to glean basic information about the importance and the differences in importance students attribute to each healthcare professional, and provide a basic indication of the value students place on teamwork among the healthcare professionals. On that basis no further items were added.

5.7.2 Reliability

Reliability is primarily concerned with consistency of measures (Bryman 2016). The PIS, RIPLS and SSRQ have been subjected to reliability testing on many occasions. Nevertheless, scales reported to have high reliability can differ when used with an alternative sample (Pallant, 2010), hence it was considered important that each scale was checked for reliability for its use in this study. There was no previous evidence of reliability testing in the literature for the IPWS so it was of particular importance to establish reliability for the use of this scale in this study. Two forms of reliability were determined; internal consistency and Test-retest reliability.

5.7.2.1 Internal consistency

Internal consistency ascertains if multiple items on the scale all relate to the same underlying construct and show coherence with each other (Pallant 2010; Bryman 2016; Polit and Beck 2017). The Cronbach's alpha coefficient was suitable for the reliability assessment of the multiple item scales used in this study (Cronbach 1951) and SPSS was used to calculate this statistic. The nearer the coefficient is to 1.00, then the more likely the scales items are deemed to measure the same characteristic. Scores over 0.8-0.9 are considered optimal (Litwin 1995; Bryman 2016). A minimum coefficient of 0.7 is generally regarded as an acceptable measure of scale reliability (Polit and Beck 2017). The reliability estimates for internal consistency of the scales in this study were all within an acceptable to high range and are summarised below in table 5.1

Table 5.1 *Psychometric results for the IPWS, PIS, RIPLS and SSRQ*

Scale	Valid N	Alpha
IPWS	572	0.84
PIS	572	0.79
RIPLS	572	0.85
SSRQ	572	0.93

5.7.2.2 Test-retest reliability

Test-retest reliability is concerned with the stability of measurement scores over time (Bryman 2016) and was achieved through distributing the four scales to a group of 30 undergraduate first year students, who were not part of the study sample, on two separate occasions, with a two week interval in between. Responses were subsequently compared through calculation of the correlation between the two scores using SPSS. The Pearson correlation is the Test-retest reliability coefficient, interpreted by the Sig. (2-tailed) p-value. A high correlation indicates stability of the scale with high Test-retest reliability (Bryman 2016).

However, this test of reliability has many limitations, and these need to be considered before concluding that scales have stability. Similarity of measures between the timepoints could be due to respondents simply remembering their original responses. This can particularly occur if not enough time has lapsed between data collection. The other potential problem is that if too much time has lapsed between measurements, respondents may have experienced a change relating to some event or feeling etc. which could also affect their responses (Parahoo 2014). Another difficulty can arise in that

respondent responses at T2 may be influenced by their responses at T1 thus bringing about an increased consistency that does not actually reflect the reality (Bryman 2016).

As far as the researcher is aware no unusual events in terms of changes to academic programme, clinical placements for example had occurred that would influence the validity etc. so the similarity of results should be valid. The instrument was administered with a two week interval which was considered an appropriate time lapse.

5.8 Pilot study

A pilot study was conducted in order to test, and improve if necessary, the instrument and study procedures (Polit and Beck 2017). Pilot studies are useful to not only test the suitability of questions on the scales, but also to ascertain if the research instrument functions well as a unit (Bryman 2016). Since this instrument comprised originally five scales and open-ended questions that had never been used together before, the researcher felt it was essential to pilot the instrument in advance of the main study. Self-completion questionnaires in particular need to be piloted, as unlike interview data collection methods, any confusion arising relating to questions cannot be clarified (Bryman 2016). Pilot studies are also recommended to minimise the problem of missing data frequently troublesome with longitudinal surveys and self-completed questionnaires (Kang 2013). Furthermore, as printing of hard copies of questionnaires can be costly, it could be a waste of resources if problems are not identified at an early stage before the large sample is surveyed.

In a pilot study data is best collected from a smaller sample of participants who are comparable to the main sample, rather than use the participants required for the main study (Bryman 2016). It was felt that if students completed the questionnaires on two

occasions there was more likelihood of bias. Therefore a separate sample comparable to that of the main study was used. The anticipated population size, at approximately 600, was an easy calculation based on previous student intake numbers for the various disciplines. Hence, pilot data was collected from 60 undergraduate first year healthcare students representing a recommended 10% of anticipated sample size for the main study (Treece and Treece 1982; Hertzog 2008).

The pilot study was organised with the help of the course co-ordinators who provided a scheduled timetabled period for data collection and informed potential participants about the study in advance of data collection. It quickly became apparent that not only was the course co-ordinator the best point of contact, but also well positioned to facilitate both operationalisation of the study and access to the target population. The questionnaire was administered in person by the researcher to the student sample and the procedure was assessed for the amount of time required, or any difficulties associated with its administration. The participants spent on average about 20 minutes to complete the questionnaire. The entire data collection process took about 45 minutes of the researchers' time entailing; introduction to the students, a brief overview of the study, distribution and collection of the questionnaires and time to answer questions. This proved useful to inform scheduling the data collection period on the timetable for the main study, estimating that a one hour slot per discipline group would be required at minimum to ensure completion of the data collection process.

Upon assessment of the retrieved pilot questionnaires it was apparent that most items had been completed with very few blank spaces on four of the five scales. This indicated that the questions were easily understood and amenable to completion by the study population. On that basis four out of five of the questionnaire scales were

retained for the main study as follows: The Interprofessional Working Scale (While and Barriball 1999); the Professional Identity Scale (Brown et al. 1986); the Readiness for Interprofessional Learning Scale (Parsell and Bligh 1999) and the Student Stereotypes Rating Scale (Hean et al. 2006). However, the Role Perception Scale (McKay 2004) appeared to cause some difficulty for the students. Many parts of this rating scale were left unanswered. This was the last scale on the questionnaire and it appeared to perhaps cause participant fatigue. Following review of this scale with colleagues, it was concluded that some items were ambiguous in nature and this also could have contributed to the lack of responses. Subsequently this scale was removed to maximise response rates through minimising potential participant burden and confusion (Oppenheim 1992).

Whilst the function of a pilot study is not to test hypotheses or report results (Polit and Beck 2017), preliminary testing enabled a pre-run of the planned statistical procedures which through practice, saved time later during the main study data input and analysis (Bryman 2016). Upon completion of the pilot study, the main data collection commenced in October 2011, followed by the second data collection in October 2012.

5.9 Data collection procedure

When ethical approval was granted, contact was made with the seven individual course coordinators in charge of the daily administration and organisation of the programmes to further clarify the operational particulars pertaining to the study, and organise access to the target population. Data collection was timetabled on a one hourly timetable slot per group at each time point. This had to be organised well in advance of the courses commencing as timetable sessions are quickly filled, and can be difficult to change once

established. One week in advance of each data collection time point, a participant information sheet (Appendix 3) detailing the purpose of the research and how the information would be used, was distributed to the students on commencement of their courses and again on return to study at T2. In order to limit response bias caution was taken with the wording used to explain the study purpose to ensure that neither positive nor negative ideas about IPE and IPW were evident. Course coordinators were reminded of the previously planned data collection dates and times by telephone rather than by email, as emails can sometimes be missed in a busy academic schedule. This was followed by an in-class announcement by the course co-ordinators reminding the students about the survey and when it was scheduled to take place. Due to course location on three different university sites around the city, data collection took three days to complete at each time point.

5.9.1 Questionnaire administration

At the time of data collection at each timepoint, the course coordinators introduced the researcher to the students. The researcher gave a brief description of the study reiterating its purpose and how the information would be used. An opportunity was given to ask questions. Prior to completion of the questionnaires, the students were reminded that anonymity was assured, that participation was entirely voluntary, and they were free to leave the classroom if they wished to do so. They were also asked to pay careful attention to the accurate completion of the identifier code that served to facilitate matching of the questionnaires between the timepoints. At the second timepoint, it emerged that some students had switched from one healthcare course to another after the first year. On that basis, students that either did not participate in the first data collection or moved to the class from a different healthcare discipline, were

requested not too participate at T2 and given the option to leave the classroom. This was to ensure that individuals from the same discipline groups who completed at T1, also completed at T2. This was to prevent discrepancy or confusion during data entry as to which course the participant belonged.

5.9.2 Minimising non-response bias and attrition bias

A main reason the survey was chosen for this study was because data collection is more likely to use representative samples and hence improve the validity of a study (Bryman 2016). However, non-response is a potential risk in survey research threatening external validity and resulting in subsequent inability to draw valid conclusions from the data (Barribal and While 1999). Therefore, it was critically important for the researcher to take measures to maximise response rates.

Longitudinal surveys particularly run the risk of attrition bias so a number of procedures were adopted from the outset to prevent this difficulty. The survey instrument was kept as short as possible, avoiding unnecessary questions or unfamiliar jargon, enabling questionnaire completion within 20 minutes. The open-ended items were limited in number as they take longer to complete, and can make a questionnaire appear very long owing to the blank spaces created to allow for expansion of thoughts. Poorer response rates have been reported in previous IPE studies if class time is not afforded to students to complete the survey (Hind et al 2003). To prevent this problem the questionnaires were distributed and collected by the researcher at a timetabled period in class for each discipline. Postal administration presents a risk of poorer response rates (Edwards *et al.* 2002) and this problem has been encountered before in IPE studies (Pollard and Miers 2008). Response rates using online or web surveys are reported to range from moderate to poor (Fricker and Schonlau 2012). However, face-to-face contact has been

shown to provide more satisfactory response rates, therefore, questionnaires were distributed by the researcher (Barribal and While 1999). The data collection took place within two weeks of the students commencing courses at T1, and within two weeks on return to study at T2 for all groups. It was felt that participants would be more likely to return their completed questionnaires through the maintenance of a good rapport, so students were thanked for their participation in writing at the end of the questionnaire, and then in person by the researcher before retrieving the completed questionnaires. At the data collection second timepoint it was clear that the numbers were considerably reduced in the larger healthcare groups. Whilst acknowledging students right to refuse to participate, the course co-ordinators agreed to remind students about the study and to advance any questionnaires from individuals that may have just been absent on the day. No extra questionnaires were forwarded.

5.10 Data analysis

5.10.1 Data preparation and quality checks

A database for this study was developed using the Statistical Package for Social Sciences (PASW Statistics for Windows, Chicago: SPSS Inc.) version 18.0. This programme was updated annually from the original version as new versions were made available. The most recent analysis took place using Statistical Package for Social Sciences (SPSS Statistics for windows, Armonk, NY: IBM Corp,) Version 22.0. The data from the two timepoints was merged into one database which was coded and manually entered from the hard copy questionnaires. In accordance with the recommendations by Pallant (2010), a code book was created and maintained which logged the decisions made throughout the research process and contained the meaning of the labels assigned to the variables.

Following completion of data entry at each timepoint, proofing and cleansing of data took place to prepare it for analysis. Using the frequency and explore options in SPSS, the file was screened for errors, invalid responses and missing data that are potentially caused by item non-response, impossible values or data entry errors (Pallant 2010). Frequencies and scatter plots were checked to pinpoint incorrectly inputted data and detect outliers. Winsorising and trimming the data are recognised methods considered suitable for dealing with outlying scores (Field 2013). However, it is not recommended to screen out extreme scores without an appropriate rationale for doing this and the nature of the study focus needs to be taken into account (Draper and Smith 1998; Faraway 2015). It was considered inappropriate to trim the data and delete outliers for this study as these were representative of the particular population of healthcare students' views whereby it could be expected that some students are likely to have

extreme views related to both stereotypical beliefs about their own and other disciplines and regarding their willingness to learn with other healthcare students.

The frequencies function was also used to check minimum and maximum scores whereby some errors in the form of impossible values were noticed and rectified. Logical checks ensured that the data made sense and crosstabs were used to detect values that should not be there, for example, participants with 'no previous qualification' should not tick the 'level of qualification' box. Data accuracy was further verified through selection of a random sample of 10% of questionnaires from each discipline at each timepoint and these hard copies were checked against the data inputted on the database. The procedure of reverse coding was completed before analysis of the data for relevant items on the Professional Identity Scale (PIS) and the Readiness to Learn Interprofessionally Scale (RIPLS).

5.10.2 Missing data

Missing data is problematic in survey research reducing the statistical power of a study which can mean that a test will reject the null hypothesis when it is false, and causing biased estimates that subsequently lead to invalid conclusions (Litwin 1995; Kang 2013). Missing data also poses a threat to external validity through the reduction of sample representativeness (Kang 2013). It was a particular issue for this study as missing data can be a major problem in longitudinal surveys due to attrition (Field 2013). With these problems acknowledged at an early stage in the research process, every effort was made to minimise this issue at the design phase of the study and throughout the data collection procedure.

Missing data was managed in the first instance by scrutinising the original hardcopy questionnaires to ensure data was not missing due to entry error. Following that, cases which did not complete sections of the questionnaire or provide sufficient data were excluded from the study from the outset, leaving a sample retained for analysis at TT of 534 of in total of healthcare students, and 38 comparator group students. At T2, questionnaires were matched using the unique student identifier code and any participants who did not complete the survey on both occasions, or whose codes did not match, were excluded from the longitudinal analysis, yielding a retained sample of 362 healthcare students and 25 comparator group students.

Individual missing items on the remaining cases after those excluded were minimal at less than 10%. Nevertheless, the patterns of missingness were analysed for missing completely at random (MCAR) or missing at random (MAR) or missing not at random (MNAR) before considering the use of an appropriate missing data treatment technique (Rubin 1976). Analysis of missingness was facilitated on SPSS by using Little's Missing Completely at Random (MCAR) test (IBM Corporation 2013). For this test the null hypothesis states that the data are missing completely at random. The p value is significant at the 0.05 level and if the value is greater than 0.05, the data are considered missing completely at random and the null hypothesis is therefore retained. The MCAR test revealed p values greater than 0.05 confirming that the data was missing completely at random rather than resulting from some sort of systematic bias or related to other variables. As sample size was an important consideration in the analysis of this longitudinal survey and also to maximise statistical power, replacement of the small items of missing data was chosen over deletion (Dodeen 2010). The SPSS default option of replacing missing values with the series mean or mean substitution is met with

much criticism as it can create a biased result and is particularly problematic if there are large amounts of missing data (Pallant 2010; Kang 2013). However, valid mean substitution (VMS) whereby replacement of missing values of a case by its mean of all non-missing (valid) items is an appropriate method of managing missing values when using Likert scales (Dodeen 2010) and this mechanism was employed to maximise on data for this study.

5.10.3 Descriptive statistics

Descriptive statistics were generated to illustrate the characteristics of the study participants that related to professional group, gender, age, nationality, ethnicity, previous healthcare experience and qualifications. Data analysis commenced with descriptive analysis. In order to prevent bias and preserve the false positive error rate, no inferential analyses were carried out until data collection from both time points was complete. To control for the Type 1 error rate a minimum alpha level of 0.05 was set (Warner 2008). This was reduced to 0.01 for some analysis (Pallant 2010).

5.10.4 Analysis of group differences

One of the primary objectives of this study was to explore the differences between groups on the variables of importance attributed to team working, strength of professional identity, readiness to learn interprofessionally and professional stereotypes. Analysis of variance (ANOVA) and the non-parametric equivalent, the Krustal-Wallis test were the tests of choice to meet these objectives

A one-way analysis of variance (ANOVA) is a suitable test to determine if there are statistically significant differences between the means of two or more independent groups (Pallant 2010; Field 2013). It is the simplest form of ANOVA as it uses only one grouping dimension (Salkind 2014) and was the test of choice in this study to examine group differences on data yielded from the Interprofessional Working Scale, the Professional Identity scale and the Readiness for Interprofessionally Learning Scale. A significant F test can indicate that at least two groups are different but cannot show where these differences are. As this study had six healthcare groups and one comparator group, it was necessary to conduct post hoc tests after the one-way ANOVA's to find out which groups were statistically significantly different from each other (Pallant 2010; Field 2013).

A critical part of the process in choosing the appropriate test to analyse the data involves checking to make sure that the data can be actually be subjected to parametric or non-parametric testing by meeting the assumptions for the tests (Pallant 2010; Field 2013. There are six assumptions that must be met in order to conduct a one-way ANOVA. The first three relate to study design and this study design met the first three assumptions whereby there must be one dependent variable measured at the continuous level, one independent variable that consists of two or more independent, categorical groups and independence of observations whereby there is no relationship between the observations in each group of the independent variable or between the groups themselves which is achieved by having completely different participants in each group as was the case in this study (Pallant 2010).

To successfully conduct a one-way ANOVA a further three assumptions which relate to how the data fits the one-way ANOVA model must also be met, that is, absence of

outliers, normality of distribution and homogeneity of variances (Field 2013). In this study these assumptions were not met for the variables value accredited to interprofessional working and (IPW) or strength of professional identity. Before taking a decision to conduct an alternative non-parametric equivalent, log10 transformation was conducted following reflection[24], i.e. adjustment for the negative skew was carried out on this negatively skewed data (Pallant 2010; Field 2013). As assessed by boxplot, this resulted in successful removal of all outliers for the composite group score on the Interprofessional Working Scale and for all individual groups except dietetics, whereby only two outliers remained. There was also successful removal of the outliers for the composite group score on the Professional Identity Scale and for all individual groups except nursing and medicine, whereby only one outlier and three outliers remained respectively (Figure B2). Log10 transformation also improved the normality of distribution on these variables as assessed both by visual inspection of the histogram, by assessment of the skewness statistic using the rule of 1 and by ensuring the skewness statistic was lower than double the standard error (Pallant 2010; Field 2013). The skewness statistic was an acceptable value as it was not beyond -1 and was lower than double the standard error for the composite group scores on these variables.

On the basis that the negative skew and presence of outliers were greatly improved after transforming the data and that ANOVA's are considered robust enough to deal with minor violations of assumptions relating to the skew, kurtosis and normality (Glass et al 1972; Field 2013) the decision was made to report the one-way ANOVA for the IPWS and PIS data. Furthermore, a few (less than 10%) outlying scores are reported not to

[24] Data that is negatively skewed requires a reflected transformation meaning that each data point must be reflected and then transformed (Field 2013; Laerd 2015).

cause a problem (Graham 2009). However, the assumption of homogeneity of variances was still not met after data transformation as assessed by Levene's test of homogeneity of variances. ANOVA is not robust to violation of this assumption when sample sizes are unequal whereby the F-ratio is affected, therefore the Welch ANOVA table is reported and for multiple comparisons, the Games-Howell post hoc test that allow for unequal variances is interpreted rather than the Tukey post hoc test (Field 2013). The power of the test is contingent upon sample size and a sample size of 20 is regarded as small (Stevens 1996, Pallant 2010). On that basis the significance level was set at 0.01 due to the particularly small sample of dietetic students (n=25) to avoid Type 1 error (Stevens 1996: Pallant 2010).

Slightly different circumstances lead to the decision to report the Welch ANOVA table and run the Games-Howell post hoc test for the RIPLS data than for the IPWS and PIS data so this variable will be discussed independently. The RIPLS composite score data appeared normally distributed for each group, again assessed by the skewness statistic and visual assessment of the histograms. This revealed a slightly negatively skewed distribution. However, the absolute value of the skewness statistic is not less than -1 (-0.800) thus indicating suitability for parametric testing. The Shapiro-Wilk test revealed a violation of normality ($P<.0005$) but this criterion was not taken into consideration in the decision to use parametric testing as the Shapiro-Wilk test is reported to detect significance for very minor violations of normality in samples over 50 and is reported to lack the power to detect differences in small samples (Pallant 2010; Field 2013).

There were six outliers as assessed by boxplot which log10 transformation following reflection did not improve. The decision was made to retain these in the analysis for two reasons. Firstly, it is not always recommended as good research practice to screen

out extreme scores just on the basis that they just do not fit the analysis technique or model and the nature of the data and what it is representing needs to also be carefully considered (Draper and Smith 1998; Faraway 2015). These scores are representative of the opinions of this particular population of healthcare students whereby it could be expected that some participants may have extreme views relating to sharing their learning with other healthcare disciplines. Secondly, a one-way ANOVA was conducted without the six outliers for comparison purposes. This showed no change in significance of the overall results. The assumption of homogeneity of variances was also violated as assessed by Levene's test of homogeneity of variance (P=.024).

The Krustal-Wallis test is a rank based non-parametric test which can be used to determine if there are statistically significant differences in medians between two or more groups and is the non-parametric equivalent of the one-way ANOVA (Field 2013). This test does not reveal which groups are different from each other so post hoc tests are again necessary. The Krustal-Wallis test was used to examine group differences between how the seven groups involving the individual six healthcare groups and the non-healthcare comparator group rated the importance of the presence of each healthcare professional on the interprofessional working team. Pairwise comparisons were then performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. As running multiple comparisons can inflate the risk of a type 1 error, the significance level was set at .01 (Pallant 2010).

The study design associated assumptions for this test are similar to those for the one-way ANOVA, dictating that there must be one dependent variable measured at the continuous level or ordinal level, one independent variable that consists of two or more independent, categorical groups and independence of observations and these were met

by this study design. The nature of the data also met the fourth assumption for this test, that is, similarity of distributions. This step involved initially generating medians from the data and then assessing to see if these distributions of IPWS ratings were similar for all groups, as visually determined by assessment of individual boxplots (Vargha and Delaney 1998; Pallant 2010). This test was subsequently deemed suitable for use.

An independent samples *t*-test was run to determine if there were gender differences for the value placed on interprofessional working and on readiness for interprofessional working. There was homogeneity of variances, as assessed by Levene's test for equality of variances ($P = .067$) at T1 but not T2 ($P = .027$). Hence the results from the standard *t*-test which uses pooled variances in its calculations and requires no modification to the degrees of freedom was reported (Field 2013).

5.10.5 Longitudinal analysis

This study sought to identify changes over the course of the year on importance attributed to team working, strength of professional identity, readiness to learn interprofessionally and professional stereotypes. The paired samples *t*-test and non-parametric Wilcoxin signed-rank test were used to ascertain difference in scores between the two timepoints.

The paired-samples *t*-test is suitable to test the same individuals at two timepoints on the same dependent variable or to test two groups of participants that have been matched on one or more characteristics such as gender or healthcare group, and tested on one dependent variable (Pallant 2010; Sheskin 2011; Field 2013). Paired samples *t*-test were used in this study to determine if a statistically significant difference existed between the mean IPWS score for the value placed on IPW, the mean PIS score for the

strength of professional identity, and the mean RIPLS scores for readiness to learn interprofessionally between T1 and T2. This test was also used to determine if any changes that occurred over the timepoints for value placed on IPW and strength of professional identity, were unique to the healthcare as opposed to the non-healthcare group of students.

To meet the assumptions for the paired samples *t*-test the study design requires one dependent variable measured at the continuous level and one independent variable that consists of two categorical related groups or matched pairs which have the same participants in each group (Pallant 2010). Testing of the data meets the assumptions for the paired samples *t*-test involves assessing the difference between the two dependent variables for approximately normally distributed data with no significant outliers (Field 2013). This entailed creating a new variable to represent the difference between the time 1 and time 2 scores. The RIPLS data met the assumptions for this test with reasonable normality of distribution as assessed visually and by the skewness statistic. There were a few outliers but log10 transformation did not improve this and as they were few, it was considered acceptable to run the parametric test which is reported as robust in these circumstances (Field 2013). The assumptions of normality of distribution or outliers were not met for the difference between the healthcare group scores for the IPWS or PIS data but did meet the assumptions for the comparator group scores. Therefore, the data at T1 and T2 for the healthcare group were transformed and the difference assessed (Field 2013). Transformation resulted in reducing outliers and improved the normality distributions as assessed visually and by the skewness statistic. The paired samples *t*-test was subsequently conducted on the Log10 transformed data for the healthcare group.

For comparisons between T1 and T2 on the nine SSRQ characteristics, the non-parametric Wilcoxon signed-ranks test was considered appropriate to compare medians between T1 and T2 as the assumptions were violated for the parametric equivalent paired samples *t*-test as indicated by abnormal distributions and the presence of many outliers (Field 2013). The Wilcoxin signed-rank test ascertains whether there is a median difference between paired or matched data involving the same individuals. In the case of this study, the healthcare and non-healthcare participants were tested at the two timepoints on the same dependent variable i.e. the SSRQ attributes.

The first two design relating assumptions dictate that there is one dependent variable measured at the continuous or ordinal level, i.e. the SSRQ and one independent variable that consists of two categorical related groups or matched pairs with the same participants in each group, i.e. the healthcare and non-healthcare groups. The third assumption involves ascertaining if the distributions of the differences between the two related groups are symmetrical in shape (Pallant 2010; Sheskin 2011). This study met the third assumption as evaluated by the use of histograms.

5.10.6 Correlational and predictive analysis

A main feature of this study was the examination of associations between the variables and the predicative ability of variables on readiness for interprofessional learning. How closely variables are related to each other or how strongly they can predict each other is measured by the correlation coefficient (Field 2013). The correlation coefficient measures the existence and the strength of a relationship between two variables, or how strongly they can predict each other, and is represented by the parametric Pearson's r. The value of a correlation can range from +1.0 to – 1.0 which is a perfect correlation. A measure of 0 indicates no relationship exists between the two variables (Field 2013).

The non-parametric equivalent is known as the Spearman's rank-order correlation, also known as Spearman's correlation or Spearman's rho (Spearman 1904; Pallant 2010). These tests were used to address the study objectives that sought to examine relationships between the variables of importance attributed to team working, strength of professional identity, readiness to learn interprofessionally and professional stereotypes. Hierarchical multiple regression was used to examine predicative ability of variables on readiness for interprofessional learning.

5.10.6.1 Pearson's correlation

To measure reliability in this study the Pearson Correlation Coefficient was used (Pallant 2010). The Pearson correlation is the Test-retest reliability coefficient, interpreted by the Sig. (2-tailed) *p*-value. A high correlation indicates stability of the scale with high Test-retest reliability (Bryman 2016).

5.10.6.2 Spearman's rank-order correlation

A Spearman's rank-order correlation was used to examine the relationship between autostereotypes and students' readiness to learn with other professionals for each healthcare group; and heterostereotypes and students' readiness to learn with other professionals for each healthcare group. The data did not meet the assumptions to report the parametric Pearson's correlation coefficient, as there was not normality of distribution and many outlying scores were evident in the data (Pallant 2010; Field 2013). The Spearman's rank-order correlation calculates a coefficient, r_s or ρ (rho) that represents a measure of the direction and strength of a relationship or association between two variables that can be continuous or ordinal in nature (Sheskin 2011). The strength of the relationships were assessed based on Cohen's guidelines; whereby

correlations are measured as small, r= .10 to .29; medium, r= .30 to .49; and large, r = .50 to 1.0 (Cohen's 1988). The closer the correlation coefficient is to +1 or -1 then the stronger the relationship. It is important to note that the results are interpreted as associative relationships and not causal relationships (Cohen 1988; Pallant 2010).

The study design criteria to use this test necessitated two variables which can be measured on a continuous and/or ordinal scale. The variables in the context of this study are ordinal i.e. autostereotypes/heterostereotypes, and continuous i.e. readiness to learn interprofessionally. The two variables also must represent paired observations. There needs to be a monotonic relationship between the two variables which means that the relationship must indicate one of the following; as the value of one variable increases, the value of the other variable also increases, or as the value of one variable increases, the other variable value decreases. To assess if a monotonic relationship exists a scatterplot of the two variables was examined. The data met the third assumption of monotonicity as determined by visual inspection of a scatterplot of the two variables (Field 2013).

5.10.6.3 Hierarchical multiple regression

A hierarchical or sequential multiple regression is one type of regression technique whereby several independent variables are brought together to predict a value on a dependent variable (Tabachnick and Fidell 2014). This technique was used to evaluate the capacity of two control measures, i.e. Professional Identity Scale (PIS) and Interprofessional Working Scale (IPWS) to predict readiness to learn interprofessionally among the healthcare students, after controlling for the effect of age, gender and the possible influence of social factors i.e. presence of a relative who is a healthcare

professional and any previous healthcare experience that the participant may have encountered.

The rationale for choosing hierarchical multiple regression rather than the more widely used standard multiple regression, was to examine the unique contribution of the individual independent variables in the prediction of readiness to learn interprofessionally, and to control for potential confounding demographic covariates (Tabachnick and Fidell 2014; Field 2013). Previous IPE literature has revealed that mature students and students with experience of previous higher education demonstrate more negative views towards interprofessional collaboration (Pollard *et al.* 2004) and the female gender has been associated with more positive attitudes towards IPW and IPE (Curran *et al.* 2008). In the case of hierarchical multiple regression, the researcher was able to take account of these variables in the regression equation before focusing on the two independent variables of particular interest, i.e. importance attributed by students to interprofessional working and the strength of students' professional identity, that were hypothesised to predict the variance in readiness for interprofessional learning.

Before deciding to report results from multiple regression, preliminary analysis was conducted to check if the data met the critical assumptions required to successfully analyse the data using this statistical technique. The first three assumptions relate to the sample size and type of variable, i.e. there should be at least 15 participants in each group for the independent variable, there must be one continuous outcome variable (i.e. the RIPLS score) and there must be two or more predicator variables that can be either continuous (i.e. the IPWS score and PIS score), or categorical in nature (i.e. gender, relative healthcare professional, previous healthcare experience and previous higher

education). The other assumptions relate to linearity, independence of observations, homoscedasticity of residuals, absence of multicollinearity, absence of outliers, influential points or leverage points, and normality of distribution of errors (Pallant 2010; Field 2013) and will be detailed.

Testing for the assumption of linearity in hierarchical multiple regression was conducted in two stages: (1) determining if there was a linear relationship between independent and dependant variables collectively which can be determined by a scatterplot of the studentized residuals (SRE_1) against the predicted (unstandardized) values (PRE_1) and (2) ascertaining if there was a linear relationship between each independent variable and the dependent variable, determined by using partial regression plots between each independent variable and the dependent variable. It is not necessary to do this for the variables that are categorical such as age and gender (laerd 2015). The assumption of linearity was met as assessed by scatterplots. There was homoscedasticity, as assessed by visual inspection of the plot of studentized residuals versus unstandardized predicted values (Appendix 7) (laerd 2015).

In order to check that the assumption of independence of observations was met, the Durbin-Watson statistic, which can range from 0 to 4 with an ideal value of approximately 2, was interpreted (Laerd 2015). This showed a satisfactory value very close to 2 at 1.921. There was no multicollinearity evident on the basis that no independent variable had correlations above 0.7, tolerance value was not less than 0.1 and VIF fell well below the value of 10 (Laerd 2015). Outliers and other unusual points, such as influential and leverage points, can have a negative effect on the regression equation and lessen the statistical significance and the predicative correctness of the result. To check these points the SDR_1 variable (studentized deleted residual)

was examined to see if any residuals were greater than ±3 standard deviations thus indicating potential outliers (Laerd 2015). Seven of these occurred but were retained. This was because they were few in number relative to sample size, amounting to less than 2%, which is considered acceptable. To determine whether any cases exhibited high leverage, the values in the variable LEV_1 (Centered Leverage Value) were assessed for values below 0.2. No values exceeded 0.08220. On inspection of the ordered values for Cook's Distance, no cases were deemed influential as no value was greater than 1 (Cook and Weisberg, 1982). The highest value was 0.08720. The assumption of normality of distribution of the standardized residuals (errors in prediction) was met as visually assessed by histogram and P-P Plot, and by Q-Q Plot of studentized residual. On the basis of these results, hierarchical multiple regression was deemed suitable to analyse the data.

5.10.7 Open-ended items

Open-ended questions as a component of questionnaires can present a dilemma for researchers as to whether or not they should be analysed. It is not always considered essential to formally analyse the qualitative component when it functions to support quantitative survey items due to a lack of 'conceptual richness' within the data (O'Cathain and Thomas 2004:4). A number of open-ended items were included on this questionnaire survey to enable students provide further comments about sharing their learning and working on teams with other healthcare professionals. Many of these comments barely consisted of more than one sentence and some consisted of merely a few words. The responses at T1 and T2 that were coherent enough to realistically be included in the study were relatively few totalling 45 comments. However, on preliminary analysis it was apparent that these could potentially corroborate the survey

data and therefore make a meaningful contribution to the study. In order to transform the qualitative comments into insights, a thematic coding approach was utilised entailing reading and seeking parts of text that are about the same issue and attaching a code so to capture what the response is about. Data was coded in accordance with common meanings between participants (Miles et al. 2016) (Table 6.5). Coding the data facilitated emergence of themes and categories, while setting the stage for the interpretation and drawing of conclusions (Miles et al. 2016).

5.11 Conclusion

This chapter has presented the methods selected for the successful execution of this study, and has demonstrated how the chosen method helped to accomplish the study purpose. It detailed the processes that took place relating to research site and access, population, sample and sample size, inclusion and exclusion criteria, research instrument, pilot study, data collection procedure and data management. It explained the mechanisms to ensure validity and reliability. The data analysis methods were rationalised and the testing of assumptions for their suitability was explained in detail. The ethical considerations were considered in line with international ethical standards. The rational for this particular research approach has been argued, supported with evidence from research sources, and from the interprofessional literature.

5.12 *The Inward Journey*

Navigating through the methodological choices for my study was at best a challenging and a frequently frustrating process. As an academic working in the healthcare sector I was only too aware that the gold standard Randomised Controlled Trial was very much revered and I questioned and critiqued my approach in the light of this knowledge. To gain confidence in my choice of methods I was sure to scrutinise similar studies in the literature, identify their limitations, and debate my methods with colleagues and supervisors.

As the 'triangle' of interconnected variables materialised from the literature and the scales suitable to address my study objectives were decided, I still wondered if these could truly capture the feelings held by the students about the prospect of IPE. I wanted to hear the voices of my student sample but knew only too well that the time

constraints for a PhD that uses a longitudinal approach would not have the capacity to follow up students for interview or focus groups. As a researcher fundamentally positioned within a positivist paradigm, I questioned why this posed such a dilemma for me. I ultimately decided to include qualitative components to my questionnaire to at least allow the participants to expand upon their feelings if they chose to do so. I hoped this would in some way enrich the data and the quality of my findings.

Chapter 6 Findings

6.1 Introduction

This chapter presents the study findings produced from the data analysis conducted in line with the study objectives (section 3.9.2). The data was generated from the research instrument comprising four likert scales and a qualitative component. The findings are presented in three main sections. The first section (section 6.2), details a description of the study cohort, the demographic details, and the learner characteristics of the student sample surveyed. This section also presents the qualitative comments offered by the participants on the open-ended survey questions. The next section (section 6.3), presents the findings relating to the factors and influences associated with attitudes on interprofessional education and working. This comprises students' views regarding importance of interprofessional team membership, the value of interprofessional working, professional identification, readiness to learn interprofessionally, and professional stereotyping. Comparisons between the six healthcare professions represented in the sample are reported and between the healthcare professions and the comparator group where appropriate. Comparisons between timepoints are also detailed. The final section of this chapter (section 6.4) presents correlations between variables and predictions for readiness to learn interprofessionally.

6.2 The study cohort

A total of 534 first year undergraduate students from six professional healthcare disciplines in the Faculty of Health Sciences completed the survey at T1 (baseline) out of a total population of 678 representing a 78.76% response rate. A total of 38 Bachelor of Social Studies students out of a total population of 40 from the Faculty of Arts, Humanities and Social Sciences completed the survey to form the non-healthcare comparator group, representing a 95% response rate for this group. The six healthcare courses included dietetics, medicine, nursing, occupational therapy, pharmacy and physiotherapy. As expected, there was variability in number of respondents representing the healthcare disciplines (Table 6.1).

At T2, 362 healthcare students and 25 non-healthcare students successfully completed the survey. Table 6.1 displays the number of respondents by group at T1 and T2 and percentage retained at T2.

Table 6.1 Number of respondents by group at T1 and T2 and percentage retained at T2

T1 N (%)			**T2 (n) (Retained %)**		
Healthcare Discipline		**Comparator**	**Healthcare Discipline**		**Comparator**
Dietetics	25 (4.7%)		**Dietetics**	21 (84%)	
Medicine	152 (28.5%)		**Medicine**	127 (83.55%)	
Nursing	214 (40.1%)		**Nursing**	104 (48.60%)	
Occupational Therapy	39 (7.3%)		**Occupational therapy**	32 (82.05%)	
Physiotherapy	38 (7.1%)		**Physiotherapy**	24 (63.15%)	
Pharmacy	66 (12.4%)		**Pharmacy**	54 (81.81%)	
Total	**534**	**38**		**362 (67.79%)**	**25 (65.78%)**

6.2.1 Demographic characteristics

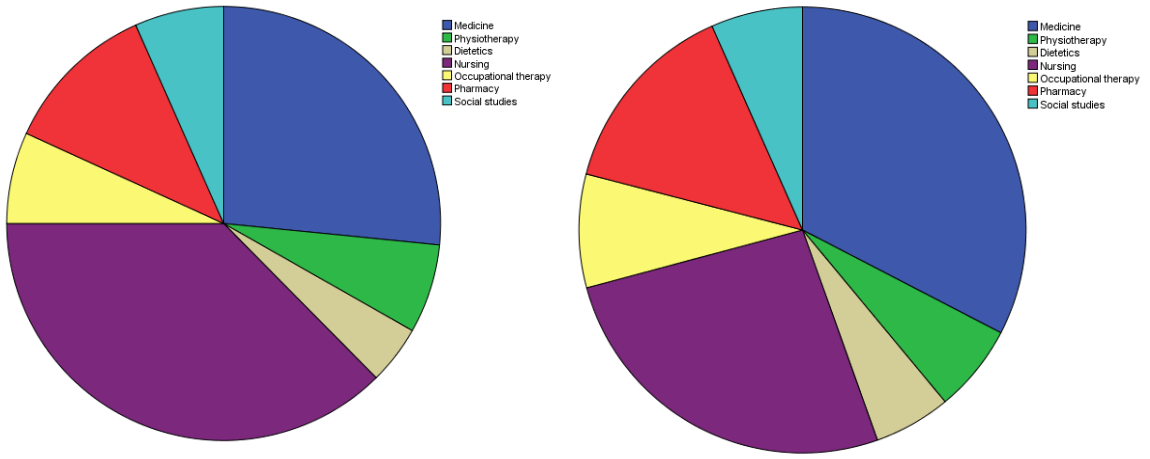
The largest proportion of the healthcare group at baseline were in the 18-22 year age bracket (80.7%, n= 431), with 1.7% (n=9) of participants aged 17 years and under, one of which reported 16 years. Mature students, 23 years and over, comprised 17.6% (n=94) of sample. For the comparator group, seven mature students, 30 students aged 18- 22 years and one student aged 17 years completed the survey at baseline. At T2, 57 mature students, and 305 students aged 22 and under completed the survey. The comparator group included four mature students, 20 aged 18-22 years and one aged 17 years. To facilitate analysis, age groups at T1 and T2 were subsequently subsumed into two categories comprising students 23 and over and students 22 and under.

The majority of participants in the healthcare group at baseline were female (74%, n=395) with males comprising 26% (n=139) in total. The highest proportion of men were in medicine (52.6%), followed by physiotherapy (28.9%) and then pharmacy (21.2%), with lowest representation in occupational therapy (12.8%), nursing (12.6%), and dietetics (8%). Figure 6.1 illustrates the proportion of the total sample at each timepoint by professional group, gender and nationality.

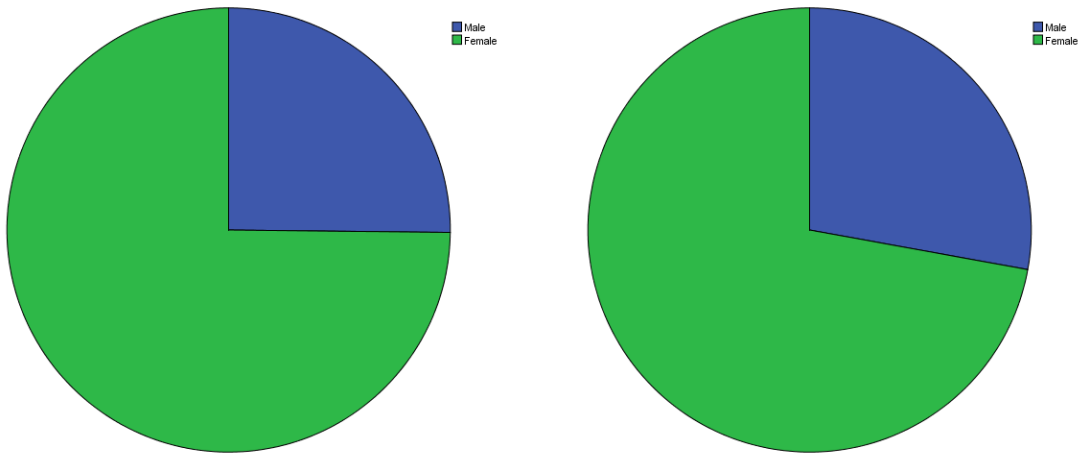
Figure 6.1 Demographic characteristics of participants at T1 (n=572) and at T2 (n=387)

Professional group

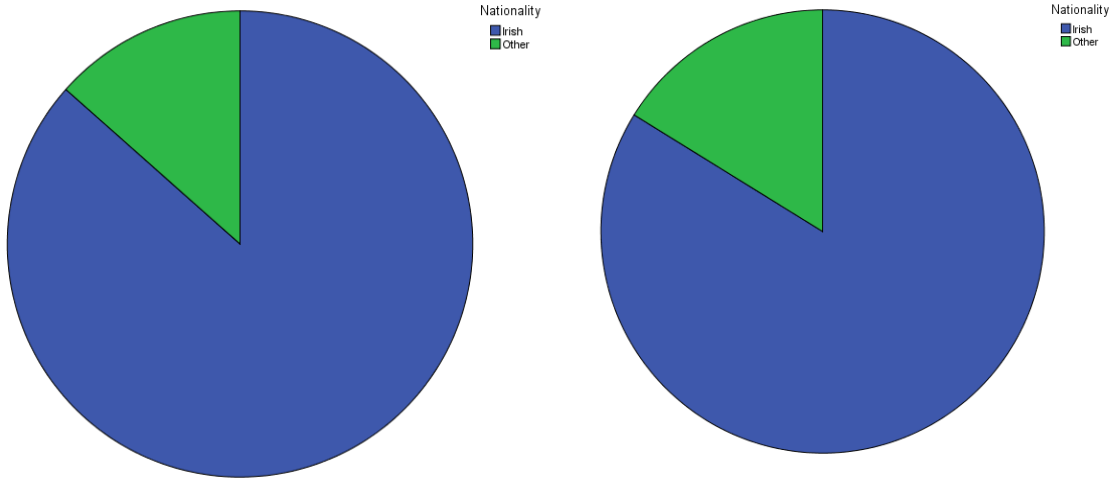
T1 **T2**



Gender

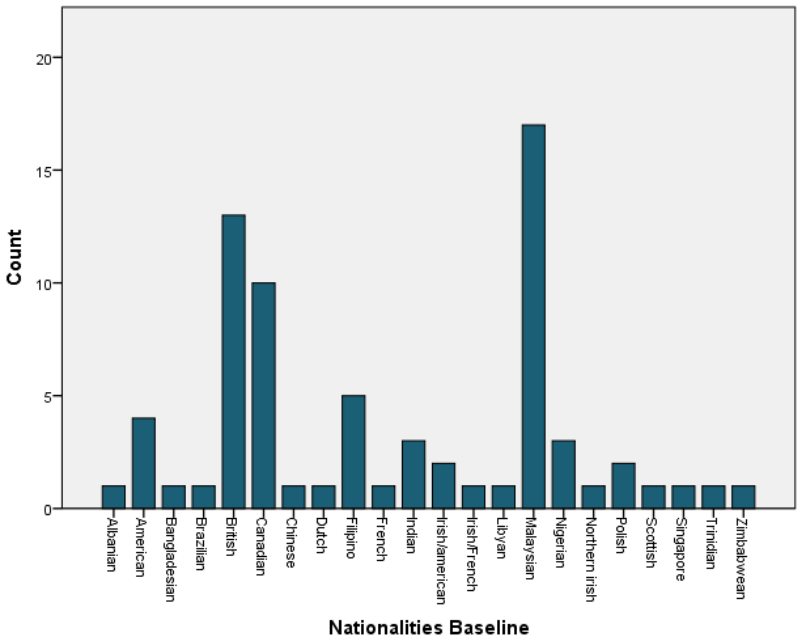


Nationality



At T2, participants comprised of 105 (29%) males and 257 (71%) females. As before, the highest proportion of men were in medicine (n=67) followed by pharmacy (n=12) and nursing (n=12) and then with lowest representation in physiotherapy (n=6), occupational therapy (n=4) and dietetics (n=2). For the comparator group, 33 females and 5 males participated at T1 and 23 females and two males at T2. The greatest proportion of the healthcare students were Irish (n=457, 85.6%), and all members of the comparator group were Irish (n=38). Non-national students accounted for 14.4% (n=77) and represented a diverse range of nationalities from across the globe. Four non-national students did not specify their nationality. Figure 6.2 displays all the nationalities of the non-native participants, the majority originating from Malaysia (n=17), Britain (n=13), and Canada (n=10). White Irish comprised the greatest proportion of ethnic representation at 83.83% (n=446) among the healthcare students, while in the entire comparator group (n=38) participants were white Irish. Table 6.2 presents the demographic characteristics of the study cohort at T1 and T2.

Figure 6.2 Nationalities of non-native participants at T1 and T2



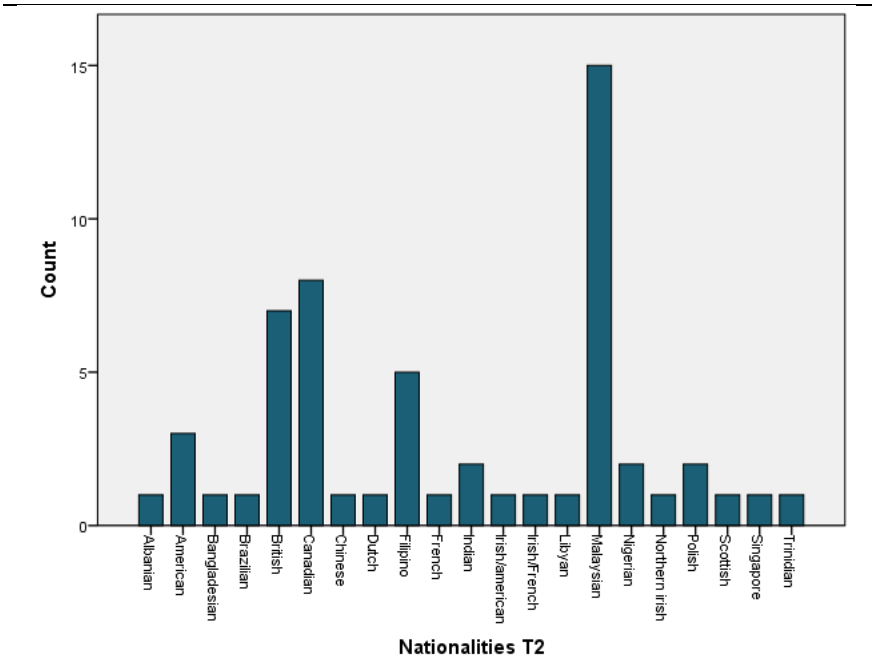


Table 6.2 *Demographic characteristics of study cohort at T1and T2*

Characteristics	T1		T2	
	Healthcare students (N=534)	**Comparator group (n=38)**	**Healthcare students (N=362)**	**Comparator group (n=25)**
	n(%)	**n(%)**	**n(%)**	**n(%)**
Age				
22 years and under	440 (82.4)	31 (81.58)	305 (83.8)	21 (84)
23 years and over	94 (17.6)	7 (18.42)	57 (16.2)	4 (16)
Gender				
Male	139 (26)	33 (86.85)	103 (29.26)	23 (92)
Female	395 (74)	5 (13.15)	249 (70.74)	2 (8)
Nationality				
Irish	457 (85.6)	38 (100)	293 (83.23)	25 (100)
Non-National	77 (14.4)		59 (16.77)	
Ethnicity				
White Irish	446 (83.83)	38 (100)	288 (81.8)	25 (100)
Irish traveler	0 (0)		0 (0)	
White Other	32 (5.6)		22 (6.3)	
Black African	10 (1.7)		5 (1.4)	
Black Other				
Asian Chinese	1 (.2)		0 (0)	
Asian Other				
Other Including Mixed	8 (1.4)		8 (2.3)	
	27 (4.7)		22 (6.3)	
	10 (1.7)		7 (2.0)	

6.2.2 Sociocultural influences associated with perspectives on interprofessional education

6.2.2.1 Previous healthcare experience

At T1 the majority of the healthcare students reported that they had no previous healthcare experience (n=344, 64.4%). A total of 187 participants who did have healthcare experience (n=190, 35.6%) specified their previous work and this was collapsed into categories of commonality (table 6.3). Hospital work (n=43), working with a pharmacist (n=37) and working as a healthcare assistant (n=29) accounted for the largest proportion of reported pre-course occupations. Others reported working with a general practitioner (n=9), physiotherapist (n=6), and dietician (n=1). The miscellaneous category comprised of a diverse range of occupations (n=62). Nine comparator students (23.7%) reported healthcare experience, four of which specified their work as previously studying nursing (n=1), healthcare assistant (n=1) and miscellaneous (n=2).

6.2.2.2 Influence of a relative who is a healthcare professional

A larger proportion of T1 healthcare students (n=320, 60%) had a relative who was a healthcare professional and of these, 215 (67%) specified the occupation. Once again this comprised of a diverse range of healthcare related occupations which were collapsed into categories (table 6.3). The most frequently reported occupations were nursing (n=221) and medicine (n=142), followed by pharmacy (n=27), physiotherapy (n=25), occupational therapy (n=3), dietetics (n=2) and a miscellaneous category (n=51). Two hundred and six (64.37%) healthcare students affirmed that they had been influenced by this person with 49

respondents commenting on this influence. In the comparator group 21 students had a relative who was a healthcare professional, 11 reported their views were influenced by the relative with one participant elaborating on this influence.

6.2.2.3 Previous professional qualification

The majority of the healthcare students (n=530, missing=4) did not have a previous academic qualification (n=432, 81.5%). Of the 91 students that had, 28 held a certificate, 20 a diploma, 42 a bachelor degree and seven reported qualifications up to masters level. Five of these 91 students that indicated 'other' on the survey reported more than one qualification, one holding a certificate, diploma, and bachelor degree and four holding both a masters and bachelor degree. Seven of the comparator group students (n=37, missing=1) indicated that they had a previous qualification with four holding a certificate, two a diploma, and one both a certificate and a diploma.

6.2.2.4 Choice of healthcare course

One fifth of the healthcare students (n=107, 20%) indicated that their current discipline was not their first course of choice with 102 of these students specifying their course of preference. Medicine represented the most popular first choice for these respondents (n=53), followed by physiotherapy (n=13) and midwifery (n=11). Just over one third of pharmacy students specified that they would have preferred medicine (n=23). Two students from the comparator group reported that they would have preferred occupational therapy, while four others suggested other non-healthcare occupations.

Table 6.3 *Sociocultural influences associated with perspectives on interprofessional learning and working*

Sociocultural influences		**Healthcare students** (N=534)(%)	**Comparator group** (N=38)(%)
		T1	
Healthcare experience	**Yes**	**n=190**	**n=9**
Hospital Work		43 (22.63)	0 (0)
Pharmacy		37 (19.5)	0 (0)
Healthcare assistant		29 (15.2)	1 (11.1)
General Practitioner		9 (4.7)	0 (0)
Physiotherapist		6 (3.6)	0 (0)
Dietician		1 (.52)	0 (0)
Studied nursing		0 (0)	1 (11.1)
Miscellaneous		62 (32.63)	2 (22.2)
Missing		3 (1.6)	5 (55.5)
Relative healthcare professional	**Yes**	**n=320***	**n=21***
Nurse		221 (69)	15 (71)
Doctor		142 (44.4)	1 (4.7)
Pharmacist		27 (8.4)	0 ()
Physiotherapist		25 (7.8)	1 (4.7)
Occupational therapy		3 (.9)	0 ()
Dietician		2 (.6)	1 (4.7)
Miscellaneous		51 (15.9)	5 (23.8)

*****Some students reported having more than one relative who is a healthcare professional, therefore the numbers add up to more than 320 in the healthcare group and 21 in the comparator group.

6.2.3 Participant comments on working and learning with other healthcare professionals

Students were given the opportunity to provide further comments about sharing their learning and working on teams with other healthcare professionals at T1 (Appendix 4). Response rates were relatively low by comparison to sample size at both timepoints. At T2 students were invited to specifically comment on their willingness to participate in shared learning, about when they felt shared learning should be placed in their training, and if their views had changed since they commenced their healthcare courses (Appendix 5). The comments at T2 were compiled and are reflected on table 6.4.

Table 6.4 *Comments by healthcare students on working and learning with other healthcare professionals at T2*

T2		
Q.1.		
Would you be willing to participate in shared learning with other healthcare students?	**(n=85) (%)**	
	Yes	**No**
	58 (68.2)	27 (31.8)
Q.2.		
At what stage in the course do you think shared learning between healthcare students would be best placed?		
	(n=55) (%)	
At the start of the course	**Later in the course**	**Throughout the course**
11 (20)	9 (16.3)	35 (63.7)
Q.3.		
Have your views regarding learning with other health professionals changed since you commenced your healthcare course	**(n=115) (%)**	
	Yes	**No**
	39 (33.9)	76(66.1)

The written comments by students at both timepoints were varied with some reflecting similarities. These were analysed thematically (table 6.5) and are detailed verbatim in this section. Each comment is numbered and assigned a code 'V' denoting each viewpoint.

The potential desire for greater contact with other disciplines after the first year was voiced by one student nurse who remarked:

…'We don't get to be with any other students. We are isolated outside the campus and only met other students occasionally on the wards' … (V1)

Reflecting some confusion as to the role and importance of the dietician and occupational therapist, one student nurse commented at the first timepoint:

… 'I definitely think we should learn with the doctor but don't feel a need to learn with occupational therapists or dieticians but then I'm not too sure what they do'… (V2)

Some students appeared to feel less important or equal to others. At the second timepoint one student of occupational therapy remarked:

…'I don't think we are seen as important as nurse or doctors. It is odd really but sometimes I think other professions don't understand what we do or even see us as professionals' … (V3)

Reflecting similar beliefs at T1, a student physiotherapist expressed an observation:

…'learned through hospital experience that nurses are undervalued and saw big barrier between doctors and nurses'… (V4)

A student nurse at T2 said:

… 'maybe I am just imagining it but I felt that we were the lesser profession when on rounds with the medics. The other professions were asked their opinion and seemed to do all the talking'… (V5)

What appear to be concerns reflecting lack of confidence about sharing learning, one nursing student at T1 said:

…'I don't think nurses can learn with medical or pharmacy students as they need much more points than us to get on their courses'…(V6)

Another remarked:

…'Nurses are looked down on by the medical profession so how will this work'… (V7)

Reflective of views about their own profession, two nursing students commented at T2 and said:

…'*some qualified nurses don't seem to want students on the nursing team'…* (V8)

… 'sometimes nurses don't work well with their own professions never mind work well with others'…(V9)

A few comments by medical students in this study gave the impression that they felt unable to learn effectively with other professions. One medical student at the beginning of their second year remarked:

…'*learning with nurses and other professions could undermine our own learning'…* (V10)

At the start of second year a female medical student commented:

…'I think learning with other students in college might hold all of us back. We need to learn with our own groups to do our own job'… (V11)

On course commencement, some students expressed that they realised the benefit of IPE and IPW and indicated understanding of the roles of other professions. The following comments are specifically derived from questions about previous healthcare experience or influence from a family member. Some of these reflect the belief that not all healthcare professions or professionals are valued equally or respected:

Dietetics students:

…' learned through hospital experience that nurses are undervalued and saw big barrier between doctors and nurses'… (V12)

…'learned importance of healthcare professionals working together'… (V13)

Medical students:

…'Learned how healthcare professionals on teams can improve livelihood and care to relatives and people' … (V14)

…' learned importance of nurses and their responsibilities'… (V15)

…' learned that empathy and academic competence is very important '… (V16)

…'more respect for nurses'… (V17)

…' learned the importance of nurses, psychologists and dieticians are to treatment of patients'… (V18)

…'nurses and physio's are crucial to patient care'… (V19)

…'good working relationships with other healthcare profs make work easier for everyone'… (V20)

…' learned about importance of other healthcare roles'… (V21)

Physiotherapy students:

…' pharmacists are highly qualified but can't diagnose patients'… (V22)

…'nurses do lot of work and show junior doctors how things are done. Dr's rely on the nurses'… (V23)

…'learned that physio and OT were less stressful than nursing'… (V24)

…'learned respect and recognition for other healthcare professionals'… (V25)

Nursing students:

…'Rewarding job morally and financially re stability'… (V26)

…'tough but rewarding'… (V27)

…'more respect for healthcare professionals'… (V28)

…'sometimes puts nurses down but speaks highly of paramedics'… (V29)

…'rewarding, lots of responsibility'… (V30)

…'listening to her but always wanted to do nursing anyway'… (V31)

…'learned importance of teamwork'… (V32)

…' heard nurses are not treated right' … (V33)

…' know it's hard work'… (V34)

…' learned about how nurses' status compares to doctors'… (V35)

Occupational therapy students:

…' wouldn't go into nursing due to system, weak union, tough job, low pay'… (V36)

…' learned how physically and emotionally draining nursing can be '… (V37)

…' had great respect for other healthcare profs… emphasised the importance of IPW'…(V38)

…'learned about healthcare from nurses' perspective'… (V39)

…' learned about physios and health care professionals '… (V40)

Pharmacy students:

On influence from a nurse relative the student remarked:

. . . 'they don't speak very highly of the doctors'…(V41)

Also relating to influence on beliefs by a relative, other pharmacy students said:

…'increased interest in pharmacy and deterred interest in dietetics'… (V42)

…'learnt that the healthcare team all have vital roles'… (V43)

…' 'nurses are practical, competent and good at teamwork with good people skills and very empathetic'… (V44)

Comparator Group:

With a direct reference to professional stereotyping one social studies student drawing from previous healthcare experience remarked:

…' able to see how nurses did more work than their stereotype portrays '… (V45)

Table 6.5 *Thematic analysis of participants' written viewpoints*

Category	**Theme (n=44)**	**Code (V) /n**
Enabling IPE & IPW		
	DESIRING IPE	n=58
	POSITIVE INFLUENCES FROM PREVIOUS EXPERIENCES	V 15,17,18,19,21,23,24,25,26,27, 28,30,31,34,37,39,40,43,44,45
	VALUING IPW	V 13,14,20,32,38
Disabling IPE & IPW		
	NOT DESIRING IPE	n=27
	INEQUALITIES BETWEEN HEALTHCARE PROFESSIONS	V 6,12,10,7,5,4,3,22,29,33,35, 36,42,45
	NEGATIVE INFLUENCES FROM PREVIOUS EXPERIENCES	V 22,29,33,35,36,41,42,45

6.3 Factors and influences associated with attitudes on interprofessional education and working

6.3.1 The importance attributed to interprofessional team membership and the value attributed to interprofessional working

The Interprofessional Working Scale (IPWS) (While and Barriball, 1999) elicited two fundamental perspectives about teamwork from students:

Section 1.

How highly they rated the importance of the six healthcare professions on the interprofessional team at each timepoint, and if there were statistically significant differences between the timepoints on importance of each profession.

Section 2.

The value they placed on interprofessional working at each timepoint, and if there were statistically significant differences between the timepoints on value of IPW and if there were gender differences in value attributed to IPW.

Section 1

6.3.1.1 Importance attributed to the presence of the six healthcare professions on the interprofessional team

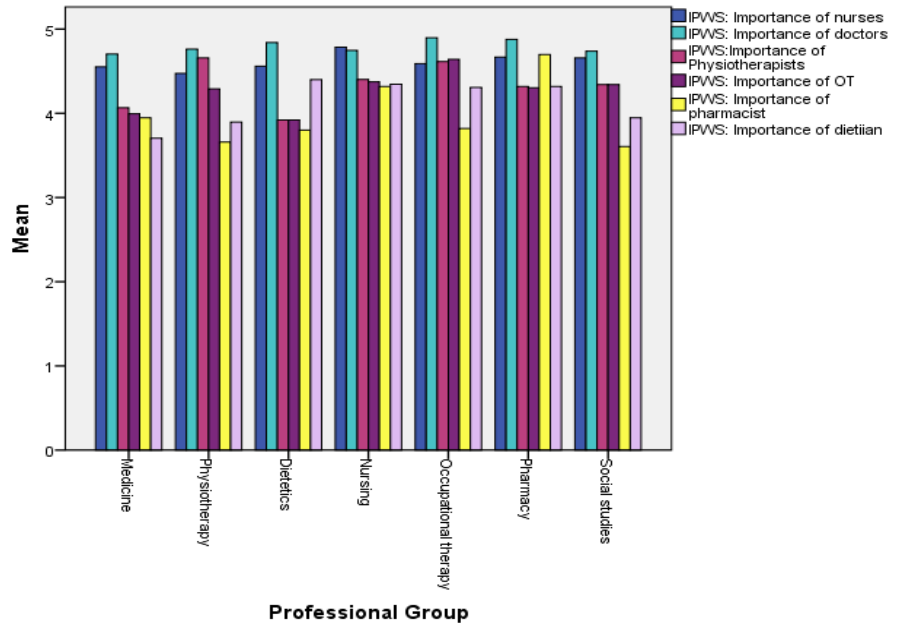
At T1, the highest rating of importance of interprofessional team membership by all healthcare and non-healthcare students was attributed to doctors, with 78% of respondents rating their presence on the team as 'very important' (*M= 4.75, SD= .52*). This was followed by nurses with 67% of respondents rating them as 'very important' (*M= 4.63, SD= .58*). Pharmacists *(M= 4.41, SD= .92*) and dieticians (*M= 4.10, SD= .85*) received the lowest ratings of 'very important' at 40% and 35% respectively while occupational therapy and physiotherapy students were rated very similar at 41% (*M*=4.22, *SD*= .78) and 42% (*M*=4.28, *SD*= .73) respectively. The lower standard deviation among the raters for doctors and nurses is indicative of congruence of perspectives between the groups.

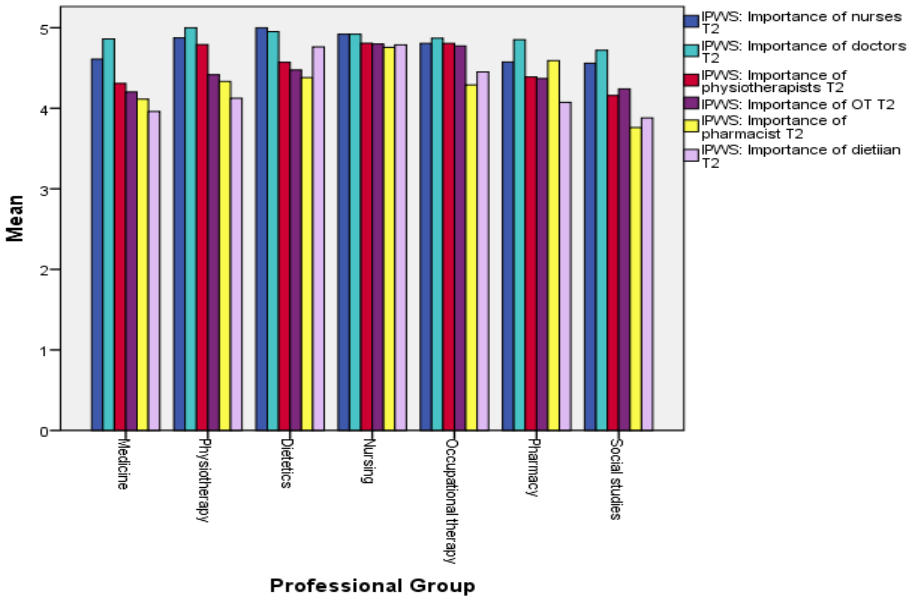
The non-healthcare comparator group attributed very similar ratings with the highest rating again attributed to the doctor with a 'very important' rating of 74% (*M= 4.74, SD= .45*), followed by nursing at 66% (*M=4.66, SD= .48*), and occupational therapy and physiotherapy students at 42% (*M*=4.34, *SD*= .63). Dieticians and pharmacists were rated lower in importance by the comparator group than the healthcare group at *26% (M= 3.95, SD= .84*), and 21% (*M= 3.61, S= .97*) respectively.

At T2, a similar profile emerged with the highest rating of importance on interprofessional team membership by all healthcare and non-healthcare students was again attributed to

doctors (*M= 4.88, SD= .52*), followed by nurses (*M= 4.74, SD= .52*), physiotherapist (*M*=4.53, *SD*= .61), occupational therapist (*M*=4.47, *SD*= .68), pharmacist *(M= 4.38, SD= .78*), and dieticians (*M= 4.29, SD= .83*). The comparator group attributed similar, albeit lower rating at T2, with the doctor rated highest (*M= 4.72, SD= .45*), followed by nursing (*M=4.56, SD= .50*), occupational therapists (*M*=4.24, *SD*= .77), physiotherapists (*M*=4.16, *SD*= .74), dieticians (*M*=3.88, *SD*= .92) and pharmacists (*M*=3.76, *SD*= .83). Figure 6.3 displays bar charts illustrating the IPWS scale ratings for each healthcare group by the entire healthcare group, and the comparator group and T1 and T2.

Figure 6.3 Barcharts illustrating the rating profiles of the importance of each profession on the interprofessional team at T1 (n=572) and T2 (n=387)





6.3.1.2 Comparison of statistical significances between groups on importance of the healthcare discipline on the interprofessional team at T1 and across timepoints

A Krustal-Wallis test was run to explore statistical differences between how medicine (n=152), nursing (n=214), dietetics (n=25), occupational therapy (n=39), physiotherapy (n=38), pharmacy (n=66) and the non-healthcare comparator group (n=38) rated the importance of each healthcare discipline on the interprofessional team, and to ascertain if there are significant differences between any groups on the importance attributed to the presence of nurses, doctors, occupational therapists, physiotherapists or pharmacists on the interprofessional team. Data violated the assumptions for both MANOVA and ANOVA hence the selection of the non-parametric Krustal-Wallis test alternative to ANOVA was conducted. The assumption of similarity of distributions was met and seen to be similar for all groups on the IPWS ratings, as visually determined by assessment of individual boxplots (Field 2013; Pallant 2010). As running multiple comparisons can inflate the risk of a type 1 error, the significance level was set at .01 (Pallant 2010). These processes are detailed in chapter 5, section 5.10.4.

Results showed highly statistically significant median differences between the groups for the importance attributed for interprofessional team membership for nurses, $\chi2(6) = 27.354$, $P<.001$; dieticians, $\chi2(6) = 55.605$, $P<.001$; physiotherapists, $\chi2(6) = 47.175$, $P<.001$; occupational therapists, $\chi2(6) = 37.081$, $P<.001$ and pharmacists, $\chi2(6) = 74.243$, $P<.001$. There was no significant differences between the group ratings of importance of the doctor

on the interprofessional team, $\chi 2(6) = 11.228$, $P = .082$ indicating consistency between how all professions rated the doctor.

To fully dissect the ratings and glean a detailed insight into these by each discipline for each discipline, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons (Field 2013). Nursing students significantly rated the presence of the nurse on the IPW team higher than medical students ($P < .001$). Medical students rated the presence of dieticians lower than both pharmacy ($P < .001$), and nursing students ($P < .001$). The importance of the physiotherapist on the IPW team was rated lower by dietetics than occupational therapy ($P = .001$), and by their own physiotherapy group ($P = .001$). Medical students rated physiotherapy significantly lower than nursing ($P < .001$), occupational therapy ($P < .001$), and the physiotherapy group ($P < .001$). The importance of the occupational therapist on the IPW team received lower ratings by dietetics than their own occupational therapy group ($P = .002$). They also received lower ratings by medicine than nursing ($P < .001$), and medicine than occupational therapy ($P < .001$). Pharmacy rated their own profession on the interprofessional team as significantly higher for importance than medicine ($P < .001$), dietetics ($P < .001$), occupational therapy ($P < .001$), physiotherapy ($P < .001$) and the comparator group ($P < .001$). Lower significantly different ratings were also given by nursing students than pharmacy at the .05 level of significance ($P = .037$). Nursing rated the importance of the pharmacist on the interprofessional team as significantly higher than occupational therapy ($P = .002$), physiotherapy ($P = .003$), medicine ($P = .008$) and the comparator group ($P < .001$). These differences are best visualised on figure 6.3.

To ascertain if there were changes in importance ratings for each profession on the IPW team over time, a paired sample *t*-test was run. This revealed a statistically significant difference in importance ratings for each healthcare group (n=362). Nursing, physiotherapy and pharmacy received higher ratings for importance of their team membership, while doctors, occupational therapist, and dieticians received lower[25]. (Table 6.6).

[25] The mean ratings appear higher for all groups at T2 on the IPWS in section 6.3.1.1. This is because the analysis included the comparator group which resulted in higher scores.

Table 6.6 *Comparison between ratings on importance of profession on healthcare team between T1 and T2 on IPWS for healthcare group*

T1	Medicine (n=152)	Nursing (n=214)	Physiotherapy (n=38)	Occupational therapy (n=39)	Dietetics (n=25)	Pharmacy (n=66)
Mean	4.89	4.64	4.31	4.48	4.32	4.10
T2	**Medicine (n=127)**	**Nursing (n=104)**	**Physiotherapy (n=24)**	**Occupational therapy (n=32)**	**Dietetics (n=21)**	**Pharmacy (n=54)**
Mean	4.77*	4.75*	4.56*	4.23*	4.07*	4.43*

Significance difference at 0.05*

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Importance of nurses on IPW team t1: Importance of nurses on IPW team t2	362	.227	.000
Pair 2	Importance of doctors on IPW team t1: Importance of doctors on IPW team t2	362	.136	.010
Pair 3	Importance of physiotherapists on IPW team t1: Importance of physiotherapists on IPW team t2	362	.384	.000
Pair 4	Importance of OT on IPW team t1: Importance of OT on IPW team t2	362	.368	.000
Pair 5	Importance of pharmacist on IPW team t1: Importance of pharmacist on IPW team t2	362	.206	.000
Pair 6	Importance of dietiian on IPW team t1:Importance of dietiian on IPW team t2	362	.440	.000

Section 2.

6.3.1.3 Comparison of statistical significance between groups on value attributed to interprofessional working

A one-way between groups Welch analysis of variance was performed to determine if the value accredited to IPW differed between the groups, and to ascertain if there are significant differences in the value attributed to interpersonal working between any healthcare groups or between healthcare and comparator groups. The assumptions of homogeneity of variances, normality of distribution and absence of outliers were not met for the one-way ANOVA test. Therefore, log transformation was conducted following reflection for negatively skewed data (Pallant 2010; Field 2013). This is detailed with rationale in the methods chapter 5, section 5.10.4.

The independent variable 'professional group' included the seven groups: medicine (n=152; n=127), nursing (n=214; n=104), physiotherapy (n=38; n=24), occupational therapy (n=39; n=39), dietetics (n=25; n=21), pharmacy (n=66; n=54) and the non-healthcare comparator group (n=38; n=25). The dependent variable is a sum of all the scores given by the groups on the interprofessional working scale (IPWS) with a maximum value of 30 and a minimum value of 6. Lower mean scores imply low value attributed to IPW and higher mean scores are indicative of higher value placed on IPW. Table 6.7 displays the descriptive mean scores at T1 and T2 on value attributed to IPW by group.

Table 6.7 *Descriptive mean scores at T1 and T2 on value of interprofessional working by each group*

T1	Medicine (n=152)	Nursing (n=214)	Physiotherapy (n=38)	Occupational therapy (n=39)	Dietetics (n=25)	Pharmacy (n=66)	Comparator (n=38).
Mean	24.97	26.97	25.74	26.87	25.44	27.18	25.63
T2	**Medicine (n=127)**	**Nursing (n=104)**	**Physiotherapy (n=24)**	**Occupational therapy (n=32)**	**Dietetics (n=21)**	**Pharmacy (n=54)**	**Comparator (n=25).**
Mean	26.1	28.9	27.5	28.06	28.14	26.85	25.32

Results showed statistically significant differences between groups on the IPWS score, Welch's $F(6, 130.375) = 6.806$, $P<.001$, $\eta^{2=}0.07$ (table 6.8). The magnitude of the difference in the means and the effect size is measured as a medium effect size. This is based on Cohen's conventions whereby partial eta squared of .06 is considered a medium effect (Cohen 1988).

Table 6.8 *One-way Welch ANOVA for differences between groups on value at T1 attributed to IPW*

	Statistic	df1	df2	sig
Welch	6.806	6	130.375	.000

Games-Howell post hoc comparisons indicated that the mean score for the medical group was statistically significantly lower than both the pharmacy (.192, 95% *CI*(.37 to .02) *P*= .003), and the nursing group, (.214, 95% *CI*(.35 to 0.08) *P*<.001). Dietetics revealed a statistically significantly lower mean score than nursing at the .05 level of significance (.211, 95% *CI*(.46 to -.04) *P*= .042). There were no significant differences between any other groups.

6.3.1.4 Comparison between timepoints for the value attributed to interprofessional working by healthcare group and gender

A paired samples *t*-test was conducted to determine if a statistically significant difference existed between the mean IPWS score for the value placed on IPW when students entered their respective healthcare courses, and after one year of exposure to the study/culture/environment associated with being a healthcare student (n=362). It ascertained if there are significant differences in mean score between the two timepoints for the healthcare students for the value attributed to interprofessional working. A paired samples *t*-test was also ran to determine if a statistically significant difference existed between the mean IPWS score for the value placed on IPW by the comparator group at the start of their non-healthcare course and one year later (n=25). It ascertained if there are significant differences in mean score between the two timepoints for the non-healthcare comparator group of students.

Results showed a highly significant increase in the value attributed to interprofessional working for the healthcare group $t(361) = 7.28$, $P<.001$,) between baseline at the start of the course ($M= 26.26$, $SD= 3.34$), and one year later ($M= 27.43$, $SD= 2.86$). Results conclude that there is a highly significant difference in the scores between the two timepoints. There was no significant difference in the value attributed to interprofessional working for the non-healthcare comparator group $t(24) = .249$, $P= .80$, between baseline at the start of the course ($M= 25.63$, $SD= 2.99$,) and one year later ($M= 25.32$, $SD= 3.46$). The results conclude that there is no significant difference in the scores between the two timepoints for the comparator group.

Differences between groups revealed that male healthcare participants placed highly statistically significant lower value on IPW than female healthcare participants. There was homogeneity of variances, as assessed by Levene's test for equality of variances (*P*= .067) at T1 but not T2 (*P*= .027). Hence the results from the standard *t*-test which uses pooled variances in its calculations and requires no modification to the degrees of freedom was reported for T1 (Field 2013). Highly statistically significant differences were found between males and females at T1, -1.61 (95% CL, -2.25 to -0.98), *t*(532) = -5.02, *P*<.001., and at T2, -1.52 (95% CL, -2.19 to -0.84), *t*(173) = -4.47, *P*<.001, that revealed lower value placed on IPW by males than females (table 6.9).

Table 6.9 *Healthcare group gender differences on value attributed to interprofessional working at T1 and T2*

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Value attributed to interprofessional working by healthcare group:T2	1 Male	105	26.3524	3.03499	.29618
	2 Female	257	27.8716	2.67275	.16672
Value attributed to interprofessional working by healthcare group T1	1 Male	139	25.06	3.608	.306
	2 Female	395	26.68	3.137	.158

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Value attributed to interprofessional working by healthcare group:T2	Equal variances assumed	4.919	.027	-4.714	360	.000	-1.51921	.32225	-2.15294	-.88549
	Equal variances not assumed			-4.470	173.279	.000	-1.51921	.33988	-2.19006	-.84837
Value attributed to interprofessional working by healthcare group t1	Equal variances assumed	3.363	.067	-5.018	532	.000	-1.616	.322	-2.249	-.984
	Equal variances not assumed			-4.694	215.850	.000	-1.616	.344	-2.295	-.938

6.3.2 Strength of professional identity

The healthcare student participants as an entire group presented with high mean professional identity on course commencement (*M*=45.07, *SD*=4.36). The highest strength of professional identity was observed among the physiotherapy group (*M*= 46.94, *SD*= 2.72), followed by dietetics (*M*=46.68, *SD*=4.06) and occupational therapy (*M*=46.36, *SD*=4.42). The lowest mean score for strength of professional identity was seen among the medical students (*M*=43.20, *SD*= 4.50) followed by pharmacy (*M*=45.12, *SD*= 4.68) and nursing students (*M*=45.62, *SD*= 3.98).

6.3.2.1 Differences between groups for strength of professional identity

A one-way between groups Welch analysis of variance was conducted to ascertain if there are significant differences for the strength of professional identity between any healthcare groups, or between healthcare and non-healthcare comparator groups. The independent variable 'professional group' included the seven groups: medicine (n=152), nursing (n=214), physiotherapy (n=38), occupational therapy (n=39), dietetics (n=25), pharmacy (n=66) and the non-healthcare comparator group (n=38). The dependent variable is a sum of all the scores given by the groups on the Professional Identity Scale (PIS), with a maximum possible value of 50 and a minimum possible value of 10. Lower mean scores imply low strength of professional identity, and higher mean scores are indicative of higher strength of professional identity. Table 6.10 displays the mean scores and standard deviations of scores by group at T1 and T2.

Table 6.10 *Mean scores and standard deviations on PIS by healthcare group at T1 and T2*

		Medicine	Nursing	Physiotherapy	Occupational therapy	Dietetics	Pharmacy
	T1 T2	(n=152) (n=127)	(n=214) (n=104)	(n=38) (n=24)	(n=39) (n=32)	(n=25) (n=21)	(n=66) (n=54)
Mean	**T1**	43.20	45.62	46.94	46.36	46.68	45.12
	T2	42.57	45.58	48.37	45.62	47.28	43.50
SD	**T1**	4.50	3.98	2.72	4.42	4.06	4.68
	T2	4.89	4.65	2.46	4.13	3.66	5.04

The assumptions of normality of distribution and absence of outliers were not met for the one-way ANOVA test. Therefore, log transformation was conducted following reflection for negatively skewed data (Field 2013). This is detailed in methods chapter 5, section 5.10.4.

Results showed statistically significant differences between healthcare groups for strength of professional identity at both timepoints (table 6.11). The partial eta squared of .09 for these differences is measured as a medium effect size (Cohen 1988).

Table 6.11 *One-way Welch ANOVA for differences between groups on strength of professional identity at T1and T2*

		Statistic	df1	df2	sig
Welch	T1	10.43	5	118.47	.000
	T2	17.57	5	96.2	.000

6.3.2.2 Comparison between timepoints for strength of professional identity

A paired samples *t*-test was conducted to ascertain if a statistically significant difference existed between the mean PIS score for the strength of professional identity when students entered their respective healthcare courses, and after one year of exposure to the study/culture/environment associated with being a healthcare student (n=362). It ascertained if there are significant differences in mean score on strength of professional identity between the two timepoints for the healthcare students. A paired samples *t*-test was also run to determine if a statistically significant difference existed between the mean PIS score for the strength of professional identity by the comparator group at the start of their non-healthcare course and one year later (n=25). It ascertained if there are significant differences in mean score on strength of professional identity between the two timepoints for the non-healthcare comparator group of students. The assumptions for the paired samples *t*-test were not met for the difference between the healthcare group scores, but did meet the assumptions for the comparator group scores as was seen previously with the IPWS. Therefore, the data at T1 and T2 for the healthcare group were transformed and the difference assessed. This is detailed in methods chapter 5, section 5.10.4.

Results showed no significant difference in the strength of professional identity for the entire healthcare group $t(361) = .343$, $P = .73$, between baseline at the start of the course ($M = 45.07$, $SD = 4.36$) and one year later ($M = 44.50$, $SD = 4.92$) or for the non-healthcare comparator group $t(24) = 1.038$, $P = .31$ (T1: $M = 45.65$, $SD = 4.14$); (T2: $M = 45.12$, $SD = 2.97$). The results conclude that there is no significant difference in the scores between the two timepoints for strength of professional identity for all the healthcare groups or the comparator group.

6.3.3 Readiness to learn interprofessionally

Students were asked to indicate their views on learning with other discipline groups using the 19 item Readiness for Interprofessional Learning 5-point likert scale with a score range of 19-95. High scores indicate positive attitudes to IPE i.e. 95 indicates the student "strongly agreed" with IPE, while the least possible score of 19 indicates the student "strongly disagreed" with the concept of IPE.

The overall composite mean RIPLS score from all the healthcare participants was high at T1 (*M 78.29, SD 8.74*), indicating a relatively strong readiness to learn interprofessionally upon course commencement, and thus indicating a positive attitude towards learning with other professionals. Healthcare discipline specific scores revealed lowest scores for medicine (*M 72.21, SD 9.319*), while all the other discipline groups had mean scores above 80. Highest scores for readiness were seen among dietetic students (*M 82.76, SD 6.33*) and occupational therapy students (*M 82.46, SD 6.27*).

6.3.3.1 Difference between the healthcare groups for readiness to learn interprofessionally

A one-way Welch analysis of variance was performed to ascertain if there are significant differences in readiness to learn interprofessionally between healthcare students based on healthcare discipline at each time point. The independent variable related to the healthcare disciplines and the dependent variable is the sum of all the scores given by the groups on the readiness for interprofessional learning scale (RIPLS) with a maximum possible score of 95 and a minimum possible score of 19. Table 6.12 displays the mean scores and standard deviations of scores by group.

Table 6.12 *Mean scores and standard deviations on RIPLS by healthcare discipline at T1 and T2*

		Medicine (n=152) (n=127)	**Nursing** (n=214) (n=104)	**Physiotherapy** (n=38) (n=24)	**Occupational therapy** (n=39) (n=32)	**Dietetics** (n=25) (n=21)	**Pharmacy** (n=66) (n=54)
Mean	**T1**	72.21	80.32	80.68	82.46	82.76	80.19
	T2	72.29	80.08	82.33	83.9	85.61	78.0
SD	**T1**	9.31	7.27	7.89	6.26	6.33	7.26
	T2	9.6	8.35	6.45	6.06	5.76	6.55

Prior to conducting a one-way ANOVA, the RIPLS composite score data was assessed to ensure it met the assumptions for this test. Slightly different circumstances lead to the decision to use parametric testing and report the Welch ANOVA table with the Games-Howell post hoc test for the RIPLS data, than for the IPWS and PIS data. The rationale is detailed in methods chapter 5, section 5.10.4.

Results indicated a highly statistically significant difference between the healthcare groups for readiness to learn interprofessionally at T1, Welch's $F(5, 118.824) = 21.838$, $P<.0005$, $\eta^{2=}0.2$. Games-Howell post hoc analysis revealed that the medical group had statistically significant lower RIPLS scores than physiotherapy (8.47, 95% *CI* (4.10 to 12.8) $P= <.001$), dietetics (10.55, 95% *CI* (6.15 to14.94) $P= < .001$), nursing (8.11, 95% *CI* (5.51 to 1) $P= < .001$), occupational therapy (10.25, 95% *CI* (6.58 to 13.9) $P= <.001$) and pharmacy (7.98, 95% *CI* (4.6 to 11.36) $P= <.001$). There were no statistically significant differences between any other healthcare groups. Based on Cohen's conventions for interpreting effect

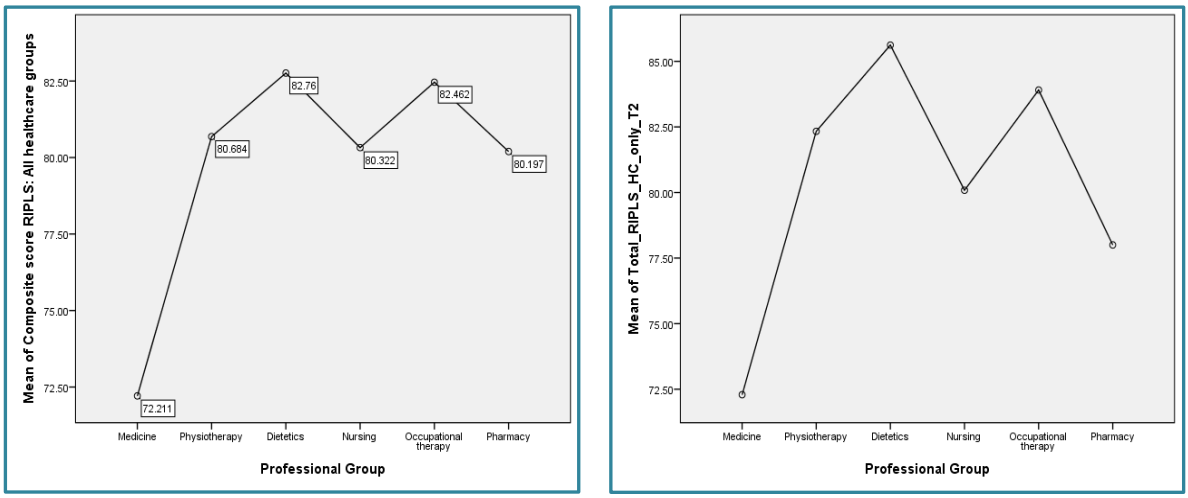
size, .14 is considered a large effect (Cohen 1988), therefore, the difference in the mean scores between groups was large (partial eta squared= .2).

Results also indicated a highly statistically significant difference between the healthcare groups for readiness to learn interprofessionally at T2, Welch's $F(5, 95.345) = 23.289$, $P<.0005$, $\eta^{2=}0.23$. Games-Howell post hoc analysis revealed that the medical group had statistically significant lower RIPLS scores than all the other groups; physiotherapy (10.04, 95% *CI* (5.36 to 14.7) *P*= <.001), dietetics (13.32, 95% *CI* (8.78 to17.86) *P*= < .001), nursing (7.79, 95% *CI* (4.39 to 11.19) *P*= < .001), occupational therapy (11.61, 95% *CI* (7.61o 15.61) *P*= <.001) and pharmacy (5.70, 95% *CI* (2.14 to 9.27) *P*= <.001). There were more differences observed at T2 between other groups. The pharmacy group had statistically significant lower RIPLS scores than dietetics (7.61, 95% *CI* (3.01 to 12.22) *P*= <.001), and occupational therapy (5.90, 95% *CI* (1.82 to 9.99) *P*= .001). The nursing group had statistically significant lower RIPLS scores than dietetics (5.53, 95% *CI* (1.03 to 10.02) *P*= .008). Based on Cohen's conventions for interpreting effect size, the difference in the mean scores between groups was also large at T2 (partial eta squared= .24).

Results conclude that there are differences between healthcare groups for readiness to learn with students from other disciplines at both timepoints, with the medical group demonstrating less willingness to participate in shared learning than their student counterparts. However, all groups including medicine scored relatively high mean scores for readiness to learn above 70 out of a highest possible score of 95. This can be visualised on the means plot showing comparison of mean scores between groups for readiness to learn interprofessionally at each timepoint (Figure 6.4).

Figure 6.4 Means plot showing comparison of mean scores between groups for readiness to learn interprofessionally at each timepoint

T1 **T2**



6.3.3.2 Comparison between timepoints for readiness to learn interprofessionally

A paired samples *t*-test was conducted to determine if a statistically significant difference existed between the mean RIPLS scores for readiness to learn interprofessionally at commencement of the healthcare course, and after one year of exposure to the study/culture/environment (n=362). It ascertained if there are significant differences in mean score between the two timepoints for the healthcare students. The data met the assumptions for parametric testing as detailed in methods chapter 5, section 5.10.4.

Results showed no significant difference in readiness to learn interprofessionally for the composite entire healthcare group score $t(361) = .774$, $P = .44$, between T1 at the start of the course ($M = 78.29$, $SD = 8.74$), and one year later ($M = 77.84$, $SD = 9.29$). Results conclude that there is no significant difference in the scores between the two timepoints for readiness for interprofessional learning for the combined healthcare groups. On individual

group analysis, paired sample *t*-test showed statistically significant lower scores for pharmacy with no changes for the other groups (table 6.13).

Table 6.13 *Individual group changes between T1 and T2 for readiness to learn interprofessionally*

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Dietetics	-1.19048	5.94659	1.29765	-3.89733	1.51638	-.917	20	.370
Pair 2	Nursing	.15385	9.64292	.94557	-1.72146	2.02915	.163	103	.871
Pair 3	Physiotherapy	.08333	7.65516	1.56260	-3.14916	3.31582	.053	23	.958
Pair 4	Pharmacy	-2.83333	6.94928	.94568	-4.73012	-.93655	-2.996	53	.004
Pair 5	Medicine	.22835	9.89163	.87774	-1.50867	1.96537	.260	126	.795
Pair 6	Occupational therapy	.40625	6.25202	1.10521	-1.84784	2.66034	.368	31	.716

6.3.3.3 Comparison between groups on individual RIPLS items 17 and 19.

Reponses on RIPLS items 17 '*The function of nurses and therapists is mainly to provide support for doctors*' and item 19 *'I have to acquire much more knowledge than other healthcare students*' show disparity between the perceptions of the groups. Medicine indicated a stronger agreement with item 17 that was sustained over timepoints. Nursing also indicated stronger agreement with this statement at T1 but with this reduced considerably at T2 (table 6.14).

Table 6.14 *Responses by group to RIPLS item 17 and 19 at T1 and T2*

			Item 17	**Item 19**
			Strongly agree/ agree	Strongly agree/ agree
	n		n	n
Medicine	152	T1	36	92
	127	T2	33	85
Physiotherapy	38	T1	3	3
	24	T2	1	1
Dietetics	25	T1	4	0
			2	0
	21	T2		
Nursing	214	T1	25	24
	104	T2	8	15
Occupational therapy	39	T1	2	2
	32	T2	1	2
Pharmacy	66	T1	12	10
	54	T2	8	11
Comparator group	38	T1	4	N/A*
	25	T2	1	N/A*
Total			**137**	**245**

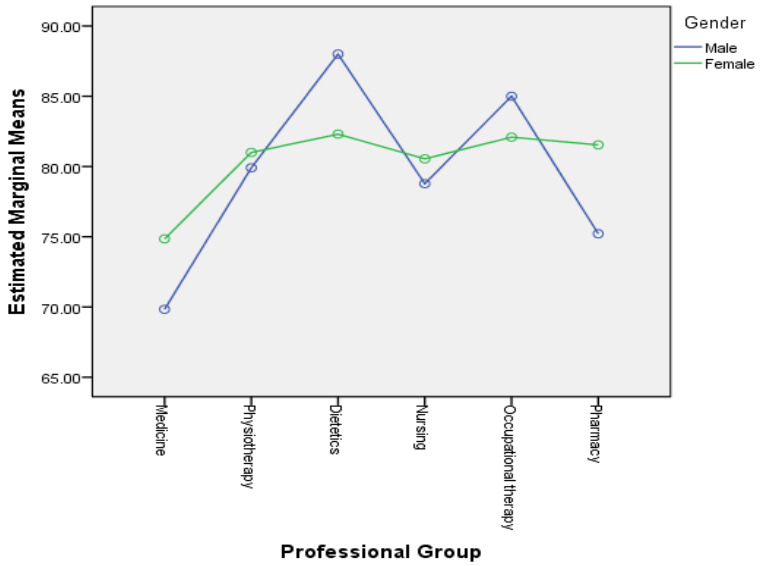
* Comparator group were not required to respond to item 19

6.3.3.4 Gender comparison on readiness to learn interprofessionally.

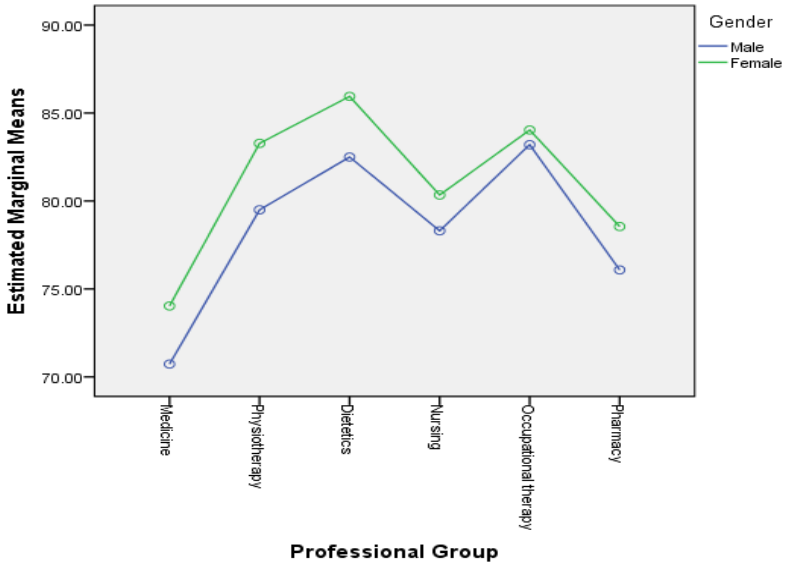
An independent samples *t*-test was performed to determine if there were gender differences on readiness for interprofessional working between the timepoints. There was homogeneity of variances, as assessed by Levene's test for equality of variances ($P = .06$) at T1 but not T2 ($P = .02$). Hence the results from the standard *t*-test which uses pooled variances in its calculations and requires no modification to the degrees of freedom was reported for T1 but not for T2 (Field 2013). Highly statistically significant differences were found between males and females at T1, -6.18 (95% CL, -7.79 to -4.57), t(532) = -7.54, $P<.001$., and at T2, -5.98 (95% CL, -8.14 to -3.82), t(171.58) = -5.47, $P<.001$, with males revealing lower RILPS scores than females. Figure 6.5 illustrates the differences in RIPLS scores for each professional group by gender at T1 and T2.

Figure 6.5 Means plots showing differences in RIPLS scores for each professional group by gender at T1 and T2

T1



T2

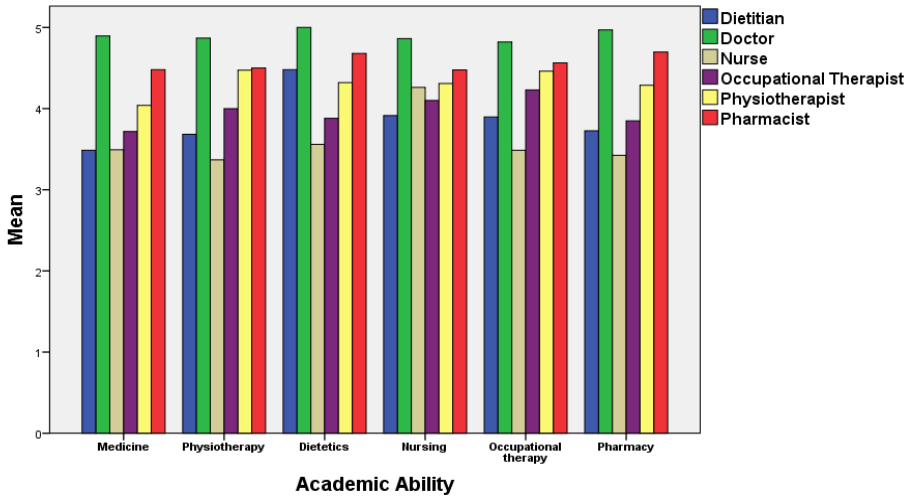


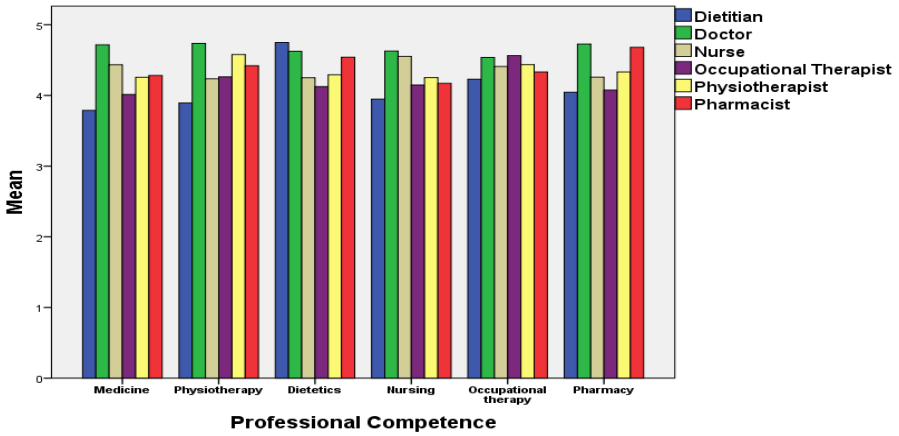
6.3.4 Autostereotypes and Heterostereotypes: Students ratings of their own and other healthcare professions on professional attributes

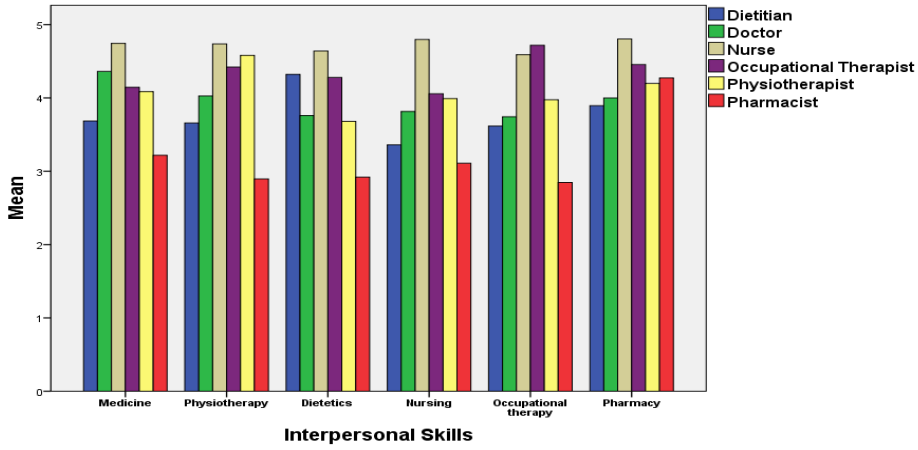
The Student Stereotypes Rating Questionnaire (SSRQ) (Hean *et al.* 2006a) was used to identify the existence of professional stereotyping among healthcare students, potentially held for their own healthcare groups (autostereotypes) and other healthcare groups (heterostereotypes), and to also illicit information as to whether stereotyped views changed during the first year of their healthcare courses. To assist with understanding if these views were held by the healthcare students uniquely, a non-healthcare comparator group also completed the scale. The SSRQ elicits information about how students rate their own and other professional groups on nine attributes of: academic ability, professional competence, interpersonal skills, leadership ability, ability to work independently, ability to be a team player, ability to make decisions, practical skills, and confidence. In keeping with studies by Hean *et al.* (2006a) and Ateah *et al.* (2011) the mean ratings were classified as high (above 4.00), medium (3.50-3.99) or low (3.49 and below). The SSRQ ascertained if the undergraduate healthcare students entered their courses with stereotyped views about their own and other healthcare professions.

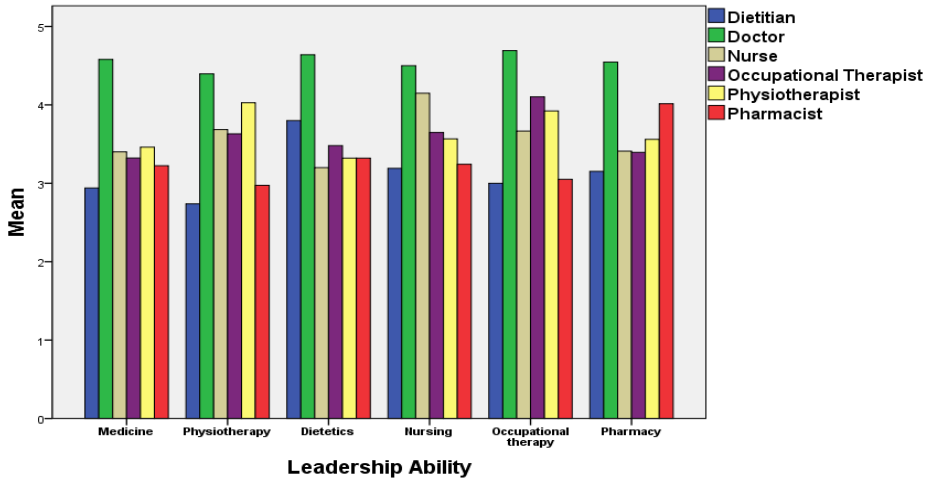
Results showed that students held stereotypes for their own and other disciplines at both timepoints, with clear differences in how students rated their own and other disciplines. Ratings at T1 are displayed with histograms (Figure 6.6). Figure 6.7 illustrates stereotype profiles for autostereotypes and heterostereotypes for each healthcare group at both T1 and T2.

Figure 6.6 Mean ratings by own and other disciplines on SSRQ characteristics at T1

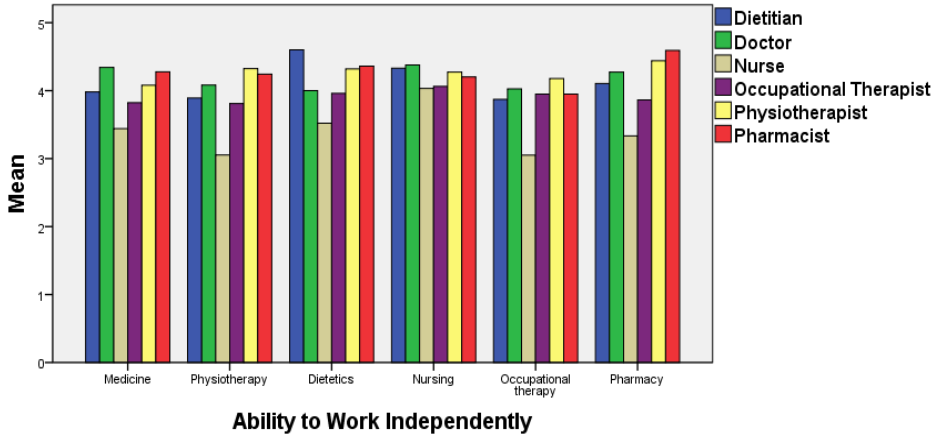




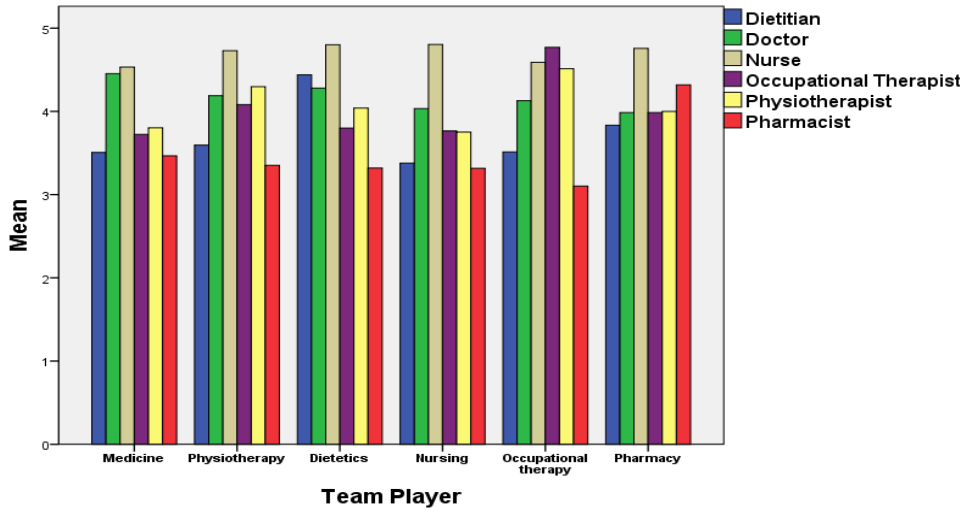




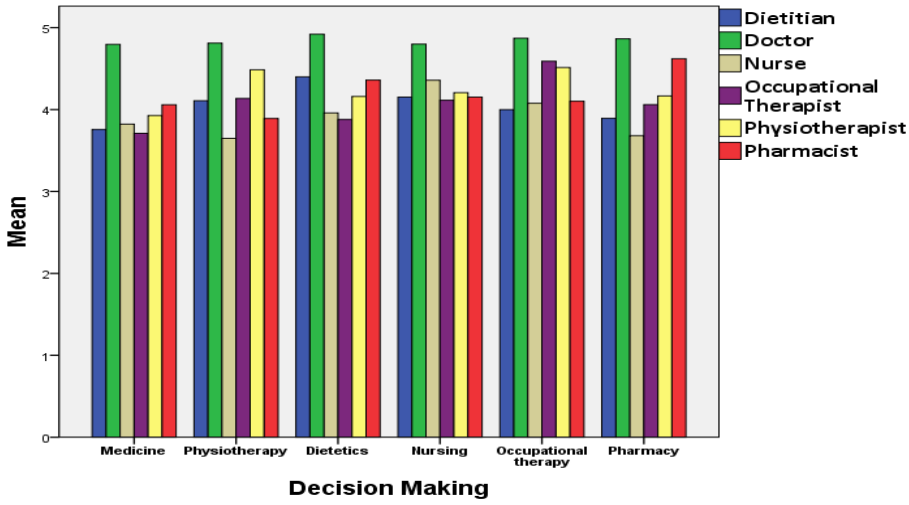
Leadership Ability



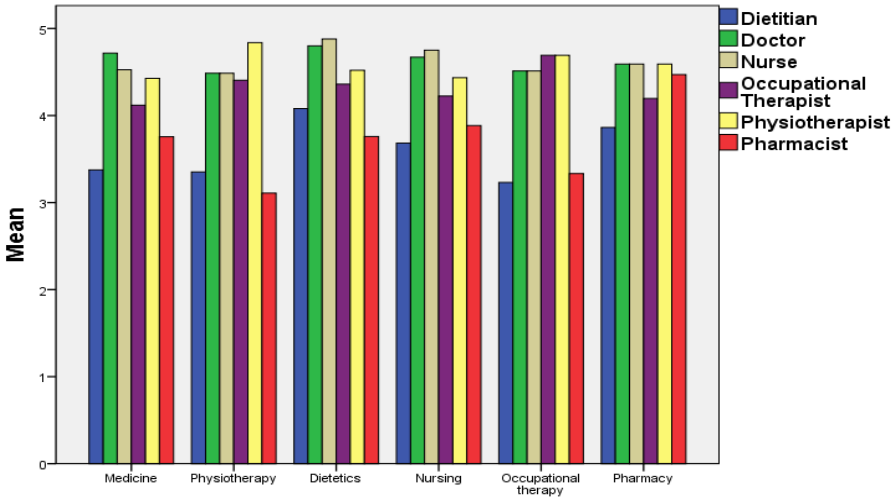
Ability to Work Independently



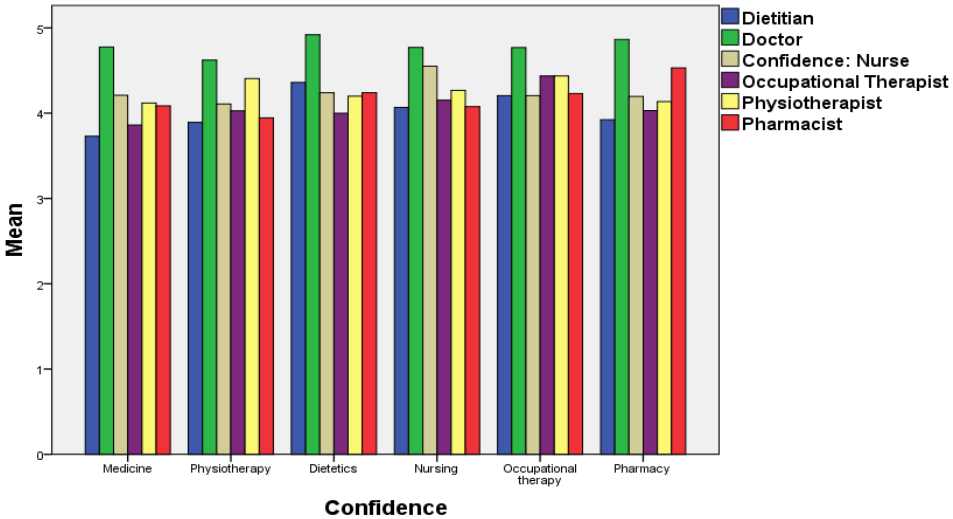
Team Player



Decision Making



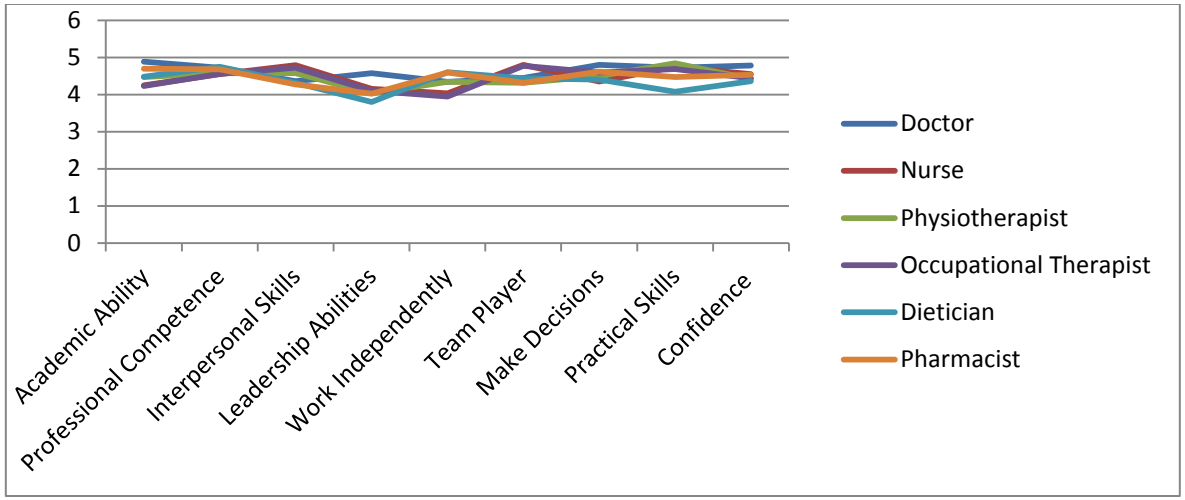
Practical Skills



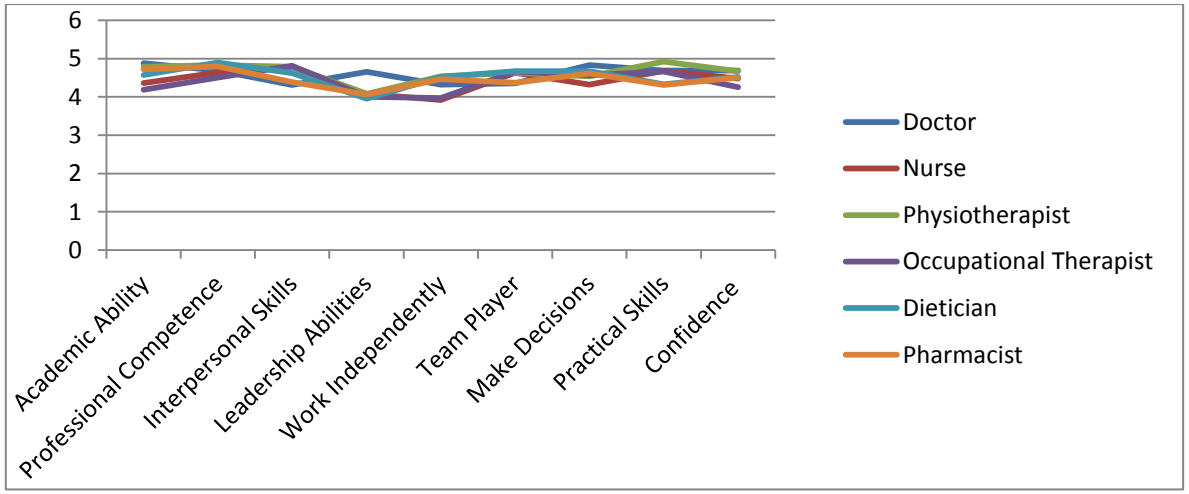
Confidence

Figure 6.7 Stereotype profiles for autostereotypes and heterostereotypes for each healthcare group at T1 and T2

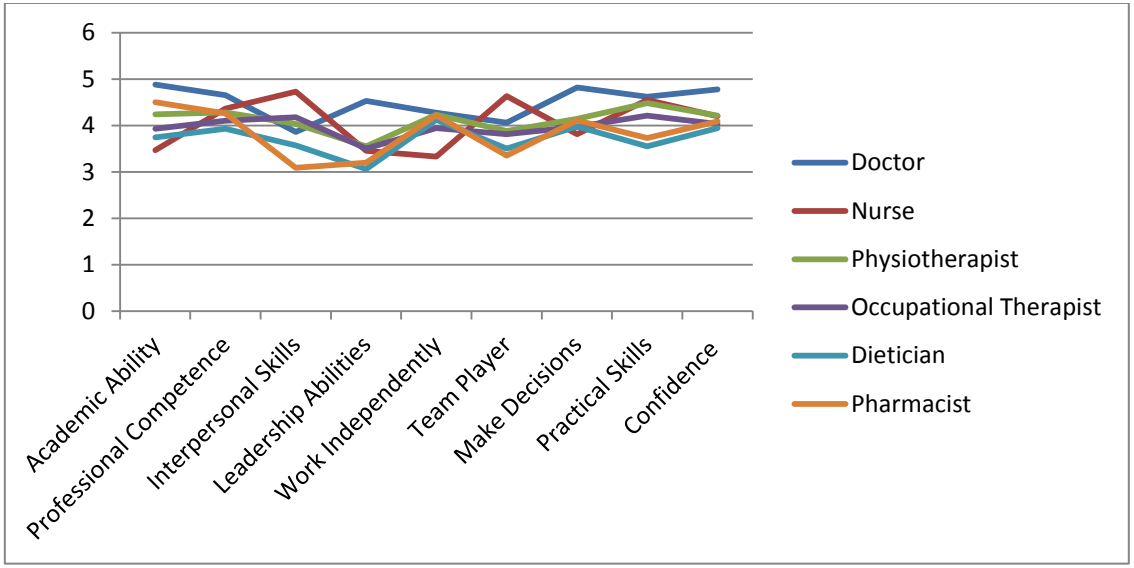
Autostereotypes T1



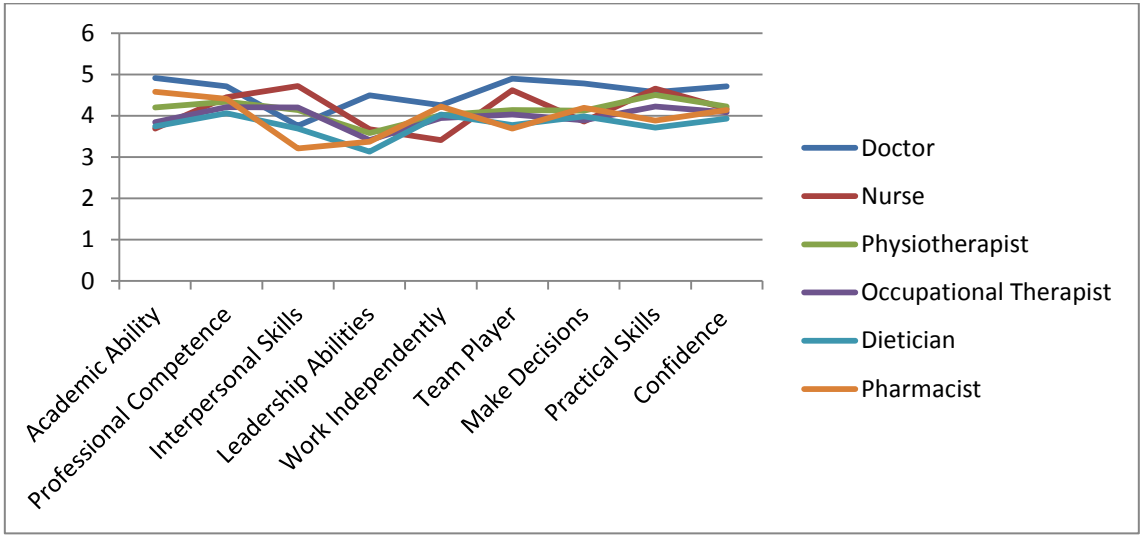
Autostereotypes T2



Heterostereotypes T1



Heterostereotypes T2



6.3.4.1 Comparisons between timepoints for autostereotypes and heterostereotypes

The nonparametric Wilcoxin signed-rank test was deemed appropriate rather than the parametric equivalent paired samples *t*-test, to illicit information as to whether stereotyped views changed during the first year of the healthcare course, and to ascertain if there are significant median differences in stereotype ratings among healthcare students/ comparator group on any of the nine SSRQ characteristics between T1 and T2. Rationale for choice of test is detailed in chapter 5, section 5.10.5. A total of 362 out of the original 534 healthcare students, and 25 out of the original 38 comparator group students, successfully completed the SSRQ at T2,

The paired ratings from cases retained at T1 and T2 from the healthcare disciplines (n=362) and comparator group (n=25) on SSRQ characteristics are presented in Table 6.15, and include the autostereotypes (A), heterostereotypes (H) and non-healthcare comparator group (CG) ratings of the disciplines[26].

Results showed that the stereotypical scores at T2 indicated a statistically significant median difference in heterostereotypes ratings on seven out of the nine characteristics There was a statistically significant median increase for the nurse on academic (z= -3.366, *P*= .001) and leadership ability (z= -2.510, *P*= .012). Of the 253 respondents that rated the nurse at T1 and T2, 89 increased the rating, 44 decreased the rating and 120 rated the same for academic ability. For leadership ability, 96 respondents increased the rating, 67 decreased the rating and 90 attributed the same rating. On the attribute of team player, four disciplines received a statistically significant higher rating

[26] The descriptive mean scores are tabulated here rather than the median because they more effectively represent the score bands of high, medium and low, and thus provide a more visually accurate picture.

over the two time points namely, dietician, (z= -2.497, *P*= .013), physiotherapist (z= -3.533, *P*= .000411), occupational therapist (z= -2.804 , *P*= .005) and pharmacist (z= -3.411, *P*= .001) with the doctor receiving a statistically significant lower score for both team player (z= -2.187, *P*= .029) and confidence (z= -2.006, *P*= .045). Other attributes that showed a significant median increase include professional competence (z= -2.050, *P*= .040) and practical skills (z= -2.369, *P*= .018) for the dietician and leadership ability for the pharmacist z= -2.905, *P*= .004). Physiotherapist ratings for ability to work independently decreased (z= -2.498, *P*= .012). The z statistic and significant median differences in scores between T1 and T2 are presented in table 6.16 for heterostereotypes, table 6.17 for autostereotypes, and table 6.18 for the comparator group.

Table 6.15 *Mean descriptive ratings at T1 and T2 by healthcare disciplines and comparator group on SSRQ characteristics*

Healthcare Discipline (n=362)	**T**	**Doctor**			**Nurse**			**Physiotherapist**			**Occ Therapist**			**Dietician**			**Pharmacist**		
Rated by		**Own HCD (A)**	**Other HCD (H)**	**CG**	**Own HCD (A)**	**Other HCD (H)**	**CG**	**Own HCD (A)**	**Other HCD (H)**	**CG**	**Own HCD (A)**	**Other HCD (H)**	**CG**	**Own HCD (A)**	**Other HCD (H)**	**CG**	**Own HCD (A)**	**Other HCD (H)**	**CG**
Number of Raters		127	235	25	105	258	25	24	338	25	32	330	25	21	341	25	54	308	25
Academic Ability	T1	4.92	4.91	4.96	4.35	3.48	4.36	4.42	4.24	4.40	4.13	3.90	4.20	4.57	3.71	3.88	4.72	4.56	4.16
	T2	4.89	4.90	4.80	4.35	3.70**	3.96*	4.79**	4.20	4.12	4.19	3.83	3.80*	4.57	3.74	3.68	4.72	4.58	4.36
Professional Competence	T1	4.72	4.70	4.60	4.63	4.39	4.52	4.63	4.32	4.48	4.58	4.13	4.32	4.90	3.93	3.88	4.72	4.35	4.00
	T2	4.68	4.71	4.48	4.65	4.45	4.32	4.83*	4.35	4.00*	4.48	4.21	3.96	4.90	4.06*	3.88	4.80	4.43	4.44*
Interpersonal Skills	T1	4.35	3.92	3.84	4.82	4.77	4.96	4.58	4.07	4.04	4.74	4.22	4.40	4.43	3.63	3.52	4.31	3.12	3.08
	T2	4.31	3.76	3.60	4.78	4.72	4.60**	4.79	4.15	3.76	4.81	4.19	3.88**	4.62	3.69	3.60	4.39	3.23	3.28
Leadership Abilities	T1	4.59	4.54	4.48	4.16	3.48	3.88	4.04	3.52	3.48	4.06	3.45	3.60	3.81	3.02	3.12	4.02	3.17	3.08
	T2	4.63	4.49	4.48	4.07	3.68*	3.92	4.08	3.58	3.76	3.97	3.40	3.64	3.95	3.13	3.20	4.06	3.39**	3.32
Work Independently	T1	4.31	4.28	4.24	4.05	3.39	3.68	4.42	4.18	4.56	3.94	3.86	4.04	4.57	4.07	4.28	4.61	4.21	3.92
	T2	4.33	4.25	3.72	3.89	3.42	3.40	4.54	4.01**	4.08	3.94	3.77	3.64	4.52	4.03	4.16	4.46	4.20	3.80
Team Player	T1	4.42	4.09	3.76	4.82	4.66	4.64	4.42	3.94	3.56	4.77	3.84	3.76	4.57	3.59	3.44	4.33	3.42	3.40
	T2	4.37	3.93*	3.88	4.62**	4.62	4.56	4.63	4.16**	3.48	4.65	4.03**	3.56	4.67	3.76*	3.40	4.37	3.70**	3.44

Make Decisions	T1	4.80	4.84	4.76	4.41	3.83	3.80	4.50	4.14	4.12	4.61	3.93	3.76	4.43	3.94	4.08	4.67	4.16	3.52
	T2	4.82	4.78	4.64	4.31	3.87	3.96	4.54	4.12	3.88	4.55	3.89	3.76	4.67	3.98	3.92	4.61	4.19	3.96
Practical Skills	T1	4.72	4.66	4.64	4.78	4.58	4.60	4.79	4.49	4.16	4.68	4.21	4.24	4.14	3.53	3.60	4.48	3.74	3.40
	T2	4.69	4.57	4.48	4.68	4.65	4.60	4.92	4.51	4.28	4.65	4.22	4.08	4.33	3.70*	3.60	4.31	3.89	4.04*
Confidence	T1	4.79	4.81	4.72	4.59	4.21	4.20	4.46	4.18	4.12	4.42	3.99	4.08	4.43	3.90	4.08	4.61	4.09	3.72
	T2	4.67*	4.71	4.60	4.46	4.17	3.96	4.67	4.22	3.88	4.23	4.09	3.96	4.52	3.92	4.08	4.50	4.14	4.12

HCD-Healthcare Discipline **CG-Comparator Group** **(A)-Autostereotypes** **(H)-Heterostereotypes**

Low Medium High Significance difference at 0.05* Significance difference at 0.01**

The asterisk highlights the attributes that revealed a significant median difference between the time points as was calculated by the Wilcoxin signed-ranks test.

Table 6.16 *Wilcoxin signed-rank test displaying significant median differences for heterostereotypes on SSRQ attributes between T1 and T2*

Healthcare Discipline	Attribute	Number of Raters (other)	Median		Wilcoxin Signed-Rank test	
		n	T1	T2	z statistic	p value
Nurse	Academic ability	258	4	4	-3.366	.001*
Dietician	Professional Competence	341	4	4	-2.050	.040*
Nurse	Leadership ability	258	4	4	-2.510	.012*
Pharmacist	Leadership ability	308	3	3	-2.972	.003*
Physiotherapist	Work independently	338	4	4	-2.581	.01**
Dietician	Team player	341	3	4	-2.494	.013*
Doctor	Team player	235	4	4	-2.184	.029**
Physiotherapist	Team player	338	4	4	-3.621	.000293*
Occ. Therapist	Team player	330	4	4	-2.887	.004*
Pharmacist	Team player	308	3	4	-3.450	.001*
Dietician	Practical skills	341	4	4	-2.337	.019*
Doctor	Confidence	235	5	5	-2.006	.045**

Significant median difference:-score increased over time * Significant median difference:-score decreased over time**

Much less change was evident among healthcare students self-rating on the attributes over time. Results revealed a statistically significant median difference in autostereotypes rating on three out of the nine characteristics. There was a statistically significant median increase for the physiotherapist on academic ability (z= -3.000, *P*= .003) and professional competence (z= -2.236, *P*= .025) and a decrease for the nurse on ability to be a team player (z= -2.836, *P*= .005).

Table 6.17 *Wilcoxin signed-rank test displaying significant median differences for autostereotypes on SSRQ attributes between T1 and T2*

Healthcare Discipline	Attribute	Number of Raters (own)	Median		Wilcoxin signed rank test	
		n	T1	T2	z statistic	p value
Physiotherapist	Academic ability	24	4	5	-3.000	.003*
Physiotherapist	Professional competence	24	5	5	-2.236	.025*
Nurse	Team player	105	5	5	-2.952	.003**

Significant difference:-score increased over time * Significant difference:-score decreased over time**

As regards the comparator group, significant median differences were revealed in ratings of healthcare students by the non-healthcare comparator group on some of the nine SSRQ characteristics. Four out of the nine attributes revealed significant median differences between the time points with decreased scores on academic ability for both nurses (z= -2.236, *P*= .025) and occupational therapists (z= -2.352, *P*= .019) and also on interpersonal skills for nurse (z= -3.000, *P*= .003) and occupational therapist (z= -2.696, *P*= .048). On the attribute of professional competence, the pharmacist had increased scores (z= -1.977, *P*= .025) while the scores for the physiotherapist (z= -2.448, *P*= .014) declined. On the practical skills attribute, the pharmacist received a significantly higher rating over the two time points (z= -2.078, *P*= .038).

Table 6.18 *Wilcoxin signed-rank test displaying significant median differences rated by comparator group on SSRQ attributes between T1 and T2*

Healthcare Discipline	Attribute	Number of CG Raters	Median		Wilcoxin Signed Rank Test	
			T1	T2	z statistic	p value
Nurse	Academic ability	25	4	4	-2.236	.025**
Occ. Therapist	Academic ability	25	4	4	-2.352	.019**
Physiotherapist	Professional competence	25	5	4	-2.448	.014**
Pharmacist	Professional competence	25	4	5	-1.977	.048*
Nurse	Interpersonal skills	25	5	5	-3.000	.003**
Occ. Therapist	Interpersonal skills	25	4	4	-2.696	.007**
Pharmacist	Practical skills	25	3	4	-2.078	.038*

Significant difference:-score increased over time * Significant difference:-score decreased over time**

6.4 Predictions and correlations for readiness for interprofessional learning

6.4.1 Factors at students' course entry predicting readiness to learn interprofessionally

This section aims to identify if the variables of gender, age, previous healthcare experience, relative a healthcare professional, professional identity development and the importance attributed to interprofessional working by the healthcare students on course entry, can predict readiness to learn interprofessionally after controlling for the effect of age, gender and the possible influence of social factors i.e. presence of a relative who is a healthcare professional and any previous healthcare experience that the participant may have encountered.

To explore the predictive ability of the independent variables on readiness, as it facilitates measurement of how much extra variation in the dependent variable can be explained by the addition of one or more independent variables, hierarchical multiple regression was considered appropriate (Field 2013). Before deciding to report results from multiple regression, preliminary analysis was conducted to check if the data met the critical assumptions required to successfully analyse the data using this statistic. This is detailed in methods chapter 5, section 5.10.6.3. Hierarchical multiple regression evaluated the capacity of two control measures, i.e. Professional Identity Scale (PIS) and Interprofessional Working Scale (IPWS), to predict readiness to learn interprofessionally among the healthcare students, after controlling for the effect of age, gender and the possible influence of social factors i.e. presence of a relative who is a healthcare professional and any previous healthcare experience that the participant may have encountered. Age and gender were initially entered at step 1 and 2 respectively

with gender explaining 10% of the variance in readiness to learn interprofessionally. The addition of the next 2 variables; relative healthcare professional and previous healthcare experience at step 3 and 4, did not contribute further to the variance. The models improved in their ability to predict readiness for interprofessional learning with the addition of the IPWS and PIS scores (i.e. R^2= .101, .251, .329 respectively). The addition of IPWS scores at step 5 resulted in a statistically significant increase in R^2 of .150, $F(1,528) = 105.357$, $P<.001$, and the addition of professional identity development scores led to a further statistically significant increase in R^2 of .079, $F(1, 527) = 61.841$, $P<.001$. Following the entry of PIS scores and IPWS scores at step 5 and 6, the total variance in readiness to learn interprofessionally explained by the model in its entirety was 32.9%. In the final model, gender, strength of professional identity and value attributed to interprofessional team working, were statistically significant to predict readiness for interprofessional learning, $R^2 = .329$, $F(6, 527) = 43.144$, $p<.001$, adjusted $R^2 = .324$. See table 6.19 for detail on each model.

Table 6.19 *Hierarchical multiple regression predicting willingness for shared learning from age, gender, relative healthcare professional, healthcare experience, value attributed to interprofessional team membership and strength of professional identity at T1*

Readiness for interprofessional learning

Variable	Model 1 B	β	Model 2 B	β	Model 3 B	β	Model 4 B	β	Model 5 B	β	Model 6 B	β
Constant	77.087**		65.632**		65.504**		66.133**		43.042**		20.847**	
Age	1.02	.05	1.48	.07	1.47	.07	1.39	.06	-.05	-.002	.105	.005
Gender			6.27**	.32	6.27**	.32	6.24**	.31	4.47**	.23	3.40**	.17
Relative healthcare professional					.104	.006	.104	.006	.086	.005	.007	.000
Previous healthcare experience							-.301	-.017	-.120	-.007	.282	.015
Interprofessional teamwork									1.051**	.402	.935**	.357
Professional identity											.585**	.292
R^2	0.002		0.101		0.101		0.101		0.251		0.329	
F	1.09		29.799**		19.835**		14.89**		35.334**		43.144**	
ΔR^2	0.002		0.099		.000		.000		0.15		0.079	
ΔF	1.099		58.38**		0.018		0.151		105.357**		61.841**	

Note N=534 . *P<.05, **P<.001.

6.4.2 Correlations at baseline between stereotypes and readiness to learn interprofessionally

A Spearman's rank-order correlation was run to explore the relationship between autostereotypes and students' readiness to learn with other professionals for each healthcare group; and heterostereotypes and students' readiness to learn with other professionals for each healthcare group. On preliminary analysis, the data did not meet the assumptions for parametric testing regarding normality of distribution or absence of outlying scores, therefore the non-parametric Spearman's rank-order correlation was conducted (Spearman 1904; Pallant 2010; Field 2013). This is detailed in methods chapter 5, section 5.10.6.2.

Results showed a significant positive moderate correlation between heterostereotypes and readiness to learn interprofessionally for dietetics: rating by all other, (n=509) $r_s(507) = .345$, $P<.001$; occupational therapy: rating by all other, (n=495), $r_s(493) = .308$, $P<.001$; and physiotherapy: rating by all other, (n=496), $r_s(494) = .346$, $P<.001$. There was a significant positive weak correlation for medicine: rating by all other, (n=382), $r_s(380) = .195$, $P<.001$; nursing: rating by all other, (n=320), $r_s(318) = .219$, $P<.001$; and pharmacy: rating by all other, (n=468), $r_s(468) = .173$, $P<.001$. For autostereotypes, there was a significant positive weak correlation with readiness seen in nursing (n=214), $r_s(212) = .245$, $P<.001$, and a moderate statistically significant positive correlation for occupational therapy (n=39), $r_s(37) = .427$, $P= .007$. The strength of the relationships were assessed based on Cohen's guidelines whereby correlations are measured as small (weak), r= .10 to .29; medium (moderate), r= .30 to .49; and large (strong), r = .50 to 1.0 (Cohen's 1988). The closer the correlation coefficient is to +1 or -1 then the stronger the relationship (Cohen

1988; Pallant 2010). It is important to note that these findings are interpreted as associative relationships and not causal relationships. There was significant evidence to conclude that as ratings by the healthcare students on the attributes for other healthcare professionals increases (heterostereotypes), so too does readiness for shared learning.

6.5 Conclusion

This chapter has presented the findings in accordance with the study objectives. It reported the demographic details of participants and outlined their comments verbatim. Ratings by students for interprofessional working/importance of teamwork, strength of professional identity, professional stereotyping, and readiness to learn interprofessionally were ascertained. Differences between healthcare groups and gender were detailed as relevant. Correlations between variables, and predictions for readiness to learn interprofessionally were reported as appropriate. The next chapter will discuss these findings in the light of what is known about this topic.

Chapter 7 Discussion

7.1. Introduction

This chapter interprets and describes the significance of the study findings, presented in the last chapter, in light of what was already known about the research problem. It commences with a review of the study purpose, aims, objectives, summary of the main findings and the *'inward journey'*. It then elucidates any new understandings or insights that may have significance for the design and implementation of effective IPE that aims to bring about improved interprofessional and collaborative working for safe, quality patient/client care in the Republic of Ireland. The findings are compared and contrasted in the context of relevant and contemporary literature, and in the light of theoretical perspectives underpinning this research. Where relevant, the quantitative data is corroborated by comments offered by the student participants. The chapter concludes with the study limitations and dissemination of findings.

7.2 Summary of study purpose.

The primary purpose of this study was to investigate the attitudes of a cohort of undergraduate healthcare students in an Irish university towards interprofessional education and working at course commencement, and at the beginning of the second year. This was to inform the development and implementation of interprofessional education interventions. Six frontline professional healthcare disciplines representing

dietetics, medicine, nursing, occupational therapy, pharmacy, and physiotherapy, participated from a Faculty of Health Sciences in one institution in the Republic of Ireland. These attitudes were compared with a non-healthcare comparator group.

The purpose of this study evolved in response to the global recognition that effective IPW is vital for safer, quality patient/client care and primary healthcare delivery within the healthcare service, and to a call for the development and implementation of effective IPE in healthcare courses in Higher Education Institutions (HEI) around the world. This is in recognition that uni-professional approaches to healthcare education do little to enable the skills and abilities for healthcare undergraduates to work interprofessionally when they enter the workforce.

Students begin their careers after qualification in a dynamic, pressured healthcare environment that necessitates effective teamwork and collaboration between the professions to bring about safe, quality patient/client care. Traditionally, healthcare students globally and in the Republic of Ireland, have completed their professional courses in 'silos' primarily divorced from engagement and collaborative learning with each other. Since commencement of this study, IPE has somewhat progressed nationally to realise interventions in this institution, and other higher educational institutions in the Republic of Ireland. However, worldwide literature reports that successful outcomes for IPE and effective IPW, is often contingent upon, or associated with attitudes and a number of underlying factors that emerged as interconnected key themes from the literature relating to: the importance/value attributed to IPW, strength of students professional identity, students' readiness for interprofessional learning, and the stereotyped attitudes students' hold towards their own and other professions. Very little is known about these attitudes and about the underlying factors from which they

can originate within our Irish population of undergraduate healthcare students. This study aimed to address this gap, making a unique contribution to the body of evidence from an Irish perspective. It is the first study conducted in the Republic of Ireland to investigate attitudes towards IPE and IPW in the light of these key themes; themes which provided a framework for this research and informed the development of the study objectives. The latter are reiterated as follows with cross-referencing to the relevant section in the findings chapter to facilitate navigation through the course of the discussion.

7.3 Specific objectives

Interprofessional working

-To ascertain the value undergraduate healthcare students attribute to interprofessional working.

-To examine differences in value attributed to interprofessional working between healthcare student groups and the comparator group.

-To examine if undergraduate healthcare students and comparator group attribute equal importance to the presence of different healthcare professions on the interprofessional working team.

(Section 6.3.1.1 & 6.3.1)

Professional identity

-To investigate the strength of professional identity among undergraduate healthcare students.

-To determine if there are differences in level of professional identification between the healthcare student groups.

(Section 6.3.2)

Readiness for interprofessional learning

-To measure undergraduate healthcare students' readiness for interprofessional learning.

-To determine if there are differences in readiness for interprofessional learning between the healthcare groups.

(Section 6.3.3)

Professional stereotyping

-To investigate the existence of stereotypes among the undergraduate healthcare students.

-To examine differences in stereotyped views between healthcare student groups and the comparator group.

(Section 6.3.4)

Gender differences on value attributed to interprofessional working and readiness for interprofessional learning

-To ascertain if there are gender differences on value attributed to interprofessional working.

--To ascertain if there are gender differences on readiness for interprofessional learning.

(Section 6.3.1.4 & 6.3.3.4)

Changes over time

-To investigate changes over a 12 month period from course commencement.

(Section 6.3.1.4; 6.3.2.2; 6.3.4.1; 6.3.3.2)

Predictions for and correlations with readiness to learn interprofessionally

-To investigate relationships at baseline between stereotyping and readiness for interprofessional learning.

- To ascertain predictive ability of strength professional identity, value attributed to IPW and learner characteristics on readiness for interprofessional learning at baseline.

(Section 6.3.4)

7.4 Summary of main study findings

At T1, 534 undergraduate healthcare students, and 38 comparator group students, and at T2, 362 healthcare students and 25 comparator group students completed the survey. Some of these students choose to expand on their views through the qualitative questions (Section 6.2.3) providing insights which assisted with interpretation, explanation and corroboration of certain aspects of data.

The value and importance attributed to interprofessional working and team membership

-Differences in perceived importance of the presence of healthcare professionals on the IPW team were evident at both timepoints, with highest importance attributed to the

doctor followed by the nurse at T1. Although there were still differences in importance attributed at T2, some groups received significantly higher ratings (nurses, physiotherapists and pharmacists) and others lower than previous (doctors, occupational therapists and dieticians) (Section 6.3.1.1 and 6.3.1.2).

-Overall IPWS composite scale scores determining the value placed on IPW were generally high at T1 and T2. However, a highly statistically significant increase was observed at T2 for the healthcare group ($P<0.001$) that was not observed in the non-healthcare comparator group. There were significant differences between disciplines in the ratings at T2 that revealed medical students assigned lower than nursing ($P<0.001$) and pharmacy ($P= .003$) for IPW. (Section 6.3.1.4).

Strength of professional identity

-Strength of professional identity was measured high on course entry for the entire cohort of healthcare students, and was retained at T2 with no significant differences between the timepoints.

-Significant differences were observed in strength of identity between the groups ($P<0.001$). The highest strength of professional identity was observed among the physiotherapy students and the lowest among the medical students followed by pharmacy and nursing students.

Readiness to learn interprofessionally

- Readiness to learn interprofessionally was measured high on course entry for the entire cohort of healthcare students indicating a positive attitude towards learning with other professionals, and was retained at T2 with no significant differences between the timepoints.

-Highly significant differences were observed in readiness to learn interprofessionally between the groups at T1 (P<0.0005) and T2 (P<0.0005). The medical students had highly statistically significant lower RIPLS scores than all other disciplines (P= <0.001 per discipline).

Autostereotypes and Heterostereotypes: Students ratings of their own and other healthcare professions on professional attributes

- Students entered their respective healthcare courses with pre-conceived stereotyped views towards their own (autostereotypes) and other professions (heterostereotypes). These emerged at both timepoints and exposed stereotype profiles of the professions (section 6.3.4). The heterostereotypes revealed much consistency with the non-healthcare comparator group best visualised on table 6.15.

- Heterostereotype and autostereotype ratings moderated between the timepoints for some groups on certain attributes. These are best visualised on table 6.16 and 6.17 respectively. The non-healthcare comparator group ratings of the disciplines also showed differences between the timepoints best visualised on table 6.18.

Gender differences on value attributed to interprofessional working and readiness for interprofessional learning

- Highly statistically significant differences were found between males and females at both timepoints (P<.001), that revealed lower value placed on IPW by males than females, best visualised on table 6.9.

- Highly statistically significant differences were found between males and females at both timepoints for readiness to learn interprofessionally (P<.001), with males revealing

lower RILPS scores than females. Figure 6.5 illustrates the differences in RIPLS scores for each professional group by gender at T1 and T2.

Predictions and correlations on readiness for interprofessional learning

- On course entry gender, strength of professional identity, and value attributed to interprofessional team working, were statistically significant to predict readiness for interprofessional learning, ($P<0.001$) (section 6.4.1), (Table 6.19).

- The relationship between autostereotypes and students' readiness to learn with other professionals for each healthcare group; and heterostereotypes and students' readiness to learn with other professionals for each healthcare group were explored on course entry. There were significantly positive moderate correlations found between heterostereotypes and readiness to learn interprofessionally for dietetics ($P<0.001$), occupational therapy ($P<0.001$), and physiotherapy ($P<0.001$). There was a significant positive weak correlation for medicine ($P<0.001$), nursing ($P<0.001$), and pharmacy ($P<0$ .001). For autostereotypes, there was a significant positive weak correlation with readiness seen in nursing ($P<0.001$), and a moderate statistically significant positive correlation for occupational therapy ($P= 0.007$). This indicated that the better students rate other disciplines then the more likely they want to learn interprofessionally.

7.5 *The Inward Journey*

It feels so good to be here! The period of time I spent inputting and analysing data seemed never ending. The use of a reflexive standpoint throughout this study subjected me to constant self-disclosure and led to deeper understandings of my research, myself, and my position within the process of inquiry. It has been a journey of self-discovery.

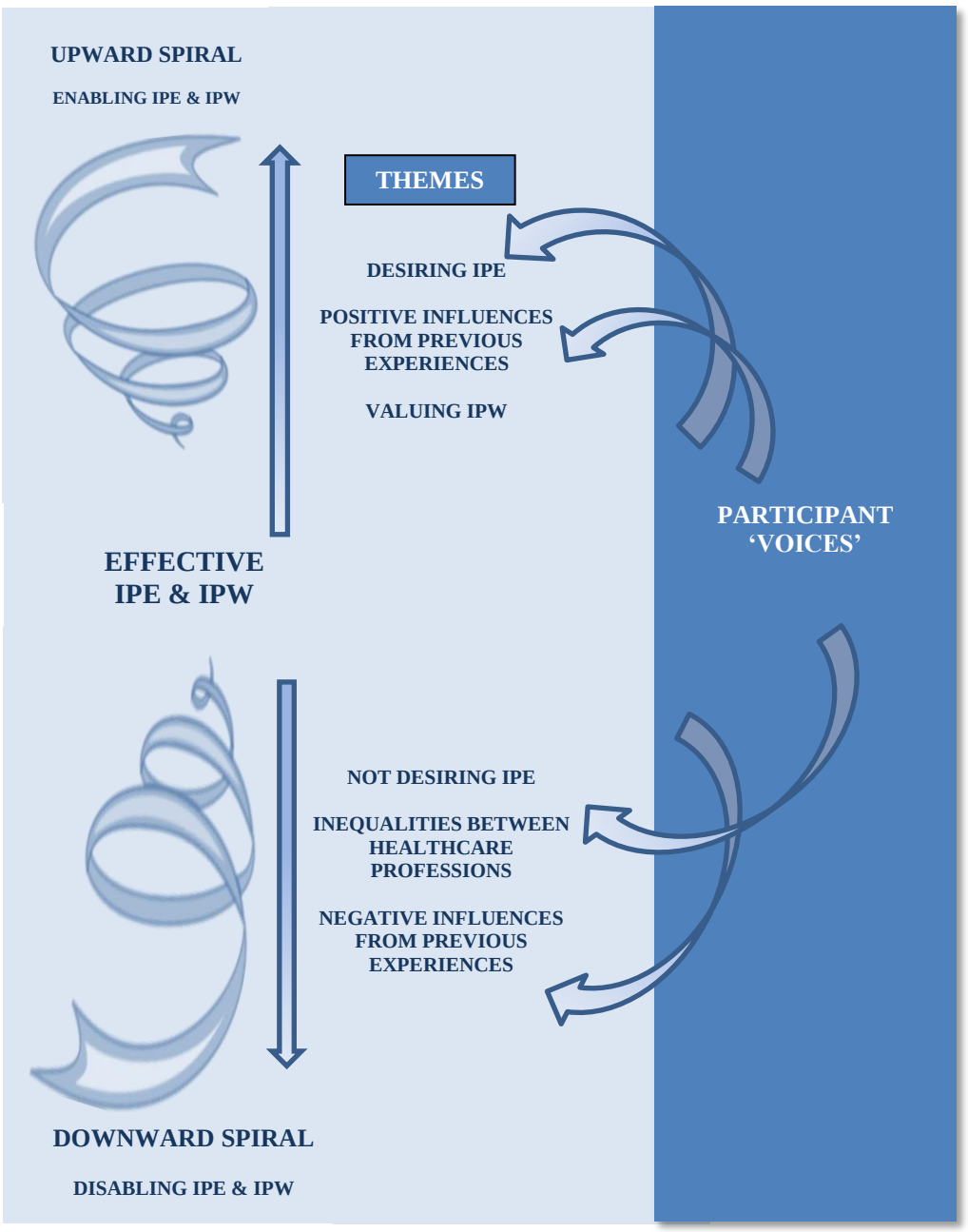
However, this process has not been without its frustrations. During the course of my study I noticed that the language as it applies to healthcare professionals changed somewhat over time. 'Healthcare professionals' seem to be now more frequently referred to as 'health and social care professionals'. This was a source of discomfort for me because I was forced to question my choice of comparator group involving social study students. In truth I had always questioned what group was best placed to act as comparator for this study and had originally chosen a group of mathematics students. However, this group were deemed to be too disparate and perhaps too far removed from the realities of healthcare. The strength of this decision hopefully lies in the fact that the social studies students belonged to an entirely different Faculty and shared different experiences to our healthcare students.

Perhaps one of the most interesting findings was the gender differences that saw males apparently less enthusiastic about shared learning and about the value placed on interprofessional working. I originally intended on looking at gender differences for post doc work but found this issue so compelling that I really could not resist delving deeper and reporting these findings at this stage. I look forward to studying this phenomenon further after my PhD.

As an IPE enthusiast I needed to constantly reflect upon the fact that I had a vested interest in positivity towards IPE and because of this probably desired and was more

inclined to report positive findings. This concern arose particularly when I thematically analysed the qualitative comments and used these to corroborate my survey data. I had to be sure I was being respectful and fair to respondents as I captured and contextualised their 'voices'. I am reasonably confident that I achieved this. As an integral part of the same community, the respondents' voices strongly resonated with me and I had to consider the powerful influences relating to my own experiences, history, and background as I constructed meaning from their words. However, my honesty as a researcher meant that I wanted above all to report the best 'representation of the truth' as possible and genuinely learn from the qualitative data. Therefore, I approached data interpretation with a view to being as truthful and transparent as possible. To my mind the views expressed broadly captured opposing scenarios which I have labelled 'enablers' and 'disablers' of IPE and IPW. I envisage these to either spiral upwards towards IPE/IPW success, or spiral downwards toward IPE/IPW failure (figure 7.1).

Figure 7.1 Visual representation of 'enablers' and 'disablers' of IPE & IPW elicited from the'voices'



7.6 Perspectives among students on interprofessional working.

Congruent with Curran *et al.* (2008), the first year student participants, both in the healthcare and non-healthcare comparator group, valued the concept of interprofessional working between healthcare professionals from the outset, as evidenced by the high mean scores on the Interprofessional Working Scale (IPWS) (table 6.7). It was most interesting to find a highly significant increase in the ratings attributed to IPW by the healthcare group between the start of the course and one year later, a change that was not observed in the non-healthcare comparator group (Section 6.3.1.4). This difference suggests that the healthcare group had greater recognition of the importance of collaboration among the professions by their second year, possibly occurring as a result of experiences unique to the healthcare courses.

However, Individual group analysis indicated that some healthcare groups appeared to attach more importance to IPW than others, showing higher mean composite scores on the IPWS. The medical group had lower overall scores than other healthcare groups, a finding also reported in previous studies (Pollard *et al.* 2004; Curran *et al.* 2008; Wilhelmsson *et al.* 2011) and one which was also evident the following year of this study. These findings are in contrast with Curran *et al.* (2008) who found no significant difference between medical and nursing students on how they viewed IPW. Males also showed highly statistically significant lower scores than females ($P<.001$), and this gender difference was sustained into the second year (section 6.3.1.4), reflecting previous studies that also identified less enthusiasm among males for interprofessional teamwork (Curran *et al.* 2008; Wilhelmsson *et al.* 2011). These findings could be reflecting the gender issues that emerged historically among professional cultures in the healthcare professions, whereby males evolved as the dominant group (Hall 2005), and

were thought to be less inclined to work collaboratively with other professions (Zelek and Philips 2003; Wilhelmsson *et al.* 2011). Similarly, the lower scores seen among the medical students could be a result of the perceived higher status attributed to the medical profession over other healthcare professions, and territorial protection of their own 'turf' (Baldwin 2007; Baker et al 2011)[27].

The students were asked to indicate how important they perceived the presence of the six healthcare professionals on the IPW team. Differences emerged between the disciplines, again indicating that the professions were not considered equal in prominence (Section 6.3.1.1). There was a strong sense of this belief among the qualitative comments (Table 6.5). The healthcare and non-healthcare groups were predominantly united in their highest ratings attributed to the importance of the doctor on the IPW team at the first timepoint, a finding reflecting the tendency of individuals in society to champion the supremacy of the doctor and once again resonating with the writings of Hall (2005), Baldwin (2007), Baker *et al.* (2011), and Bell *et al.* (2014). These are a problem for IPE, with Baker et al (2011) reporting attitudes such as these to create competition instead of collaboration between IPE participants. Hall (2005), Baldwin (2007), and Ryan (2010) argued that stereotyped hierarchies and perceived status inequality between the healthcare professions, in particular regarding the nursing and medical professions, are powerful forces causing communication difficulties between professions for IPW and IPE.

All student groups, with the exception of nursing, rated the doctor as the most important healthcare professional. Nurses also rated the doctor highly important albeit second to

[27] These issues emerged among the stereotypes and will be discussed further in later sections.

their own profession. However, nurses received the next highest overall rating after doctors. The professions of medicine and nursing are the oldest and traditionally viewed as *the* frontline professions in the delivery of patient care. They too were possibly viewed as the most vital professions for patient care in the minds of these junior students, reflecting a stereotyped view in society that appears to prevail in other cultures around the world extending to the middle East in countries, such as Singapore (Ahmad *et al.* 2013) and Iran (Keshtkaran *et al.* 2014). There was a good deal less disparity noted within the nursing group in their ratings for the other professions at the second timepoint which was not observed to the same extent within the other groups. Perhaps this indicates that the student nurses appreciated the importance of all the healthcare professions on the IPW team more so than their colleagues from other disciplines, which could have resulted from their experiences on clinical placements and/or a course philosophy with teamwork as its focus. There was an overall reduction in importance rating attributed to the doctor on the team at T2 (table 6.6) which indicates some moderation of attitudes over the course of the year.

The importance attributed to the other healthcare groups are of interest also. The pharmacist and dietician were viewed lowest for importance at both timepoints, indicating a strong and unyielding original belief among the students. However, there was an increase in importance at T2 attributed to the pharmacist and to the physiotherapist that was not seen in dietetics, medicine or occupational therapy who received lower importance scores (table 6.6). It is interesting to speculate about the much lower rating attributed by medical students to the importance of the pharmacist, when pharmacy on the other hand rated medicine the highest for importance. Whilst the pharmacy students displayed a strong sense of their position of importance on the team

in this study, indeed rating their own profession second to medicine, these findings reinforce the particularly rigid belief about perceived medical profession hierarchy. Unfortunately such perceptions of inequality do not always bode well for either effective IPW or IPE. The dental students in the study by Ajjawi *et al.* (2009) felt stereotyped and marginalised by medical students during their IPE interactions, feeling less inclined to participate in this type of learning as a result. This issue could be a cause for concern for our students as reflected in comments by two student nurses at the first timepoint:

'I don't think nurses can learn with medical or pharmacy students as they need much more points than us to get on their courses'

'Nurses are looked down on by the medical profession so how will this work'

(Section 6.2.3).

The finding that the pharmacist was considered the least important healthcare professional on the IPW team by other groups is a concern that shares similarities with other studies. Ahmed *et al.* (2013), argued students perceived less likelihood of working interprofessionally or closely with the pharmacist than they would with a doctor and nurse. It is quite possible that the pharmacist was not viewed by these junior students as an active frontline participant on the team, albeit ratings improved after the first year as aforementioned. Another possible reason might be, also previously suggested by Ahmad *et al.* (2013) is that pharmacists are perceived to work more independently as a result of the image of the pharmacist in society in business and retail. The study data may lend validity to the assertions by Henman (2008) and Gallagher and Gallagher (2012) who ascertained that the Primary Care Strategy launched in 2004 by

the Department of Health and children in Ireland barely recognised the pharmacist as a participant in the process of care. It appears from this study that this view is not unique to healthcare occupations as the comparator group voiced a very similar viewpoint. With views such as these prevalent in our society, the students may have been less inclined to view the pharmacist as important to patient/client care to the same extent that they viewed the nurse and doctor.

These findings of perceived inequality of importance between the medical and pharmacy professions are somewhat disturbing in the context of recent evidence associating medication error/polypharmacy with poor collaborative ability between doctor and pharmacist (Bretherton *et al.* 2003; Dornan *et al.* 2009; Gallagher and Gallaher 2012; Ryan *et al.* 2014; WHO 2017; HSE 2017a; Elliott *et al.* 2018). There is support among these results for the statement by the UK report of the Short Life Working Group on reducing medication-related harm: '*professionals should also work together to help reduce inappropriate polypharmacy and overmedication'* (2018:14). When pharmacists and doctors collaborate effectively in clinical situations, measurable benefits for patient clinical outcomes have been reported (Gallagher and Gallagher (2012), and given the disparities among views in this study it appears IPE could have a vital role in improving role understanding and collaboration between these two disciplines. Hawkes *et al.* (2013) reported successful outcomes among first year nurses, pharmacists and medical students engaged in IPE. Therefore, amongst these findings emerges a critical necessity for effective IPW through IPE with a focus on addressing potentially destructive perceptions of inequality[28].

[28] Issues relating to inequality will be discussed further in later sections.

It was unclear as to why the dietician received the lowest ratings of importance on the IPW team. However, there might well be some confusion as to the role and importance of the physiotherapist, dietician and occupational therapist among these first year students, particularly if they have not had any experience of working with these groups. At the first timepoint, one student nurse commented:

> *'I definitely think we should learn with the doctor but don't feel a need to learn with occupational therapists or dieticians but then I'm not too sure what they do'*
>
> (Section 6.2.3).

Historically labelled 'allied healthcare professions', these clustered professions may well be receiving lower ratings as a result of this label, which has reportedly affected their status and arguably negated their unique value and involvement in patient care (Gilbert 2005a; Baker *et al.* 2011). Interestingly, the physiotherapy and occupational therapy students in this study appeared more 'allied' than the dietetic students. Higher ratings for importance emerged among the physiotherapy and occupational therapy students for each other, than for dietetics, and this was consistent at both timepoints (Section 6.3.1.1). At the time of this study, these students shared the same building and adjacent corridors in their academic and clinical environment, whereas the dietetics students were located in a different part of the city[29]. In line with the Contact Hypothesis (Allport 1954), it is quite conceivable that these two groups shared more informal social contact with each other which may have brought about mutual appreciation between these complimentary professions, thus lending support to arguments by Reeves (2000), Morison *et al.* (2003), Mu *et al.* (2004) and Freeth *et al.*

[29] This has changed since data completion in 2012, with the dietetics students now in the same location as the physiotherapy and occupational therapy students.

(2005) that different healthcare groups can benefit from informal IPE experiences. It seems too that students in this study possibly desire this informal contact and prefer not to be isolated which is difficult given the siloed structure of the university. One student nurse remarked:

'We don't get to be with any other students. We are isolated outside the campus and only met other students occasionally on the wards'

(Section 6.2.3).

Analysis of the difference in ratings attributed to each profession between the entire healthcare group and the non-healthcare comparator group was of interest, because it indicated that experiences akin to the healthcare courses gave rise to some modification of views for the healthcare groups. At course commencement the ratings were visually very similar between healthcare and comparator (figure 6.3). At the start of the second year considerable changes were observed between these groups. No ratings by the comparator for healthcare profession were significantly different between the timepoints, whereas all healthcare professions received highly significant different ratings by the healthcare group between timepoints. At T2 the healthcare students gave higher ratings for the nurse, physiotherapist and pharmacist, and lower ratings for medicine, occupational therapy and dietetics than they did at T1 (Table 6.6). The original highest importance scores attributed to the doctor, and lowest scores attributed to the pharmacist appeared to be modified during the course of the year, a phenomenon that was not observed among the comparator group ratings.

The collective message from these findings, and one that is a concern for IPW in particular, is that the six healthcare professions were not viewed as equally important in

their role for patient/client care. Ratings of healthcare professions by the healthcare professionals should be in an ideal world similar for all healthcare groups, with the sense of equality between them that is required to work collaboratively. All healthcare professionals have their own distinct role to play in the holistic care of the patient/client. Yet there was disparity between ratings of importance of the healthcare professions by both neophyte healthcare and non-healthcare students observed within the first two weeks of their courses, indicating a somewhat distorted perspective and holding of assumptions about the unique contribution by each profession to patient/client care. These findings are suggestive of beliefs held before students ever entered their courses, probably shaped by previous experiences, and possibly rooted in stereotypes. Some of the qualitative comments indicated that students beliefs were shaped by previous healthcare experiences and family influences in terms of importance attached to the professions, inequalities, roles and value placed on IPW (section 6.2.3: table 6.5). The emergence of stereotyped attitudes among the perspectives on IPW will be given more attention in relation to autostereotypes and heterostereotypes later in this chapter. The similarity among perspectives between healthcare and non-healthcare comparator further corroborates the idea that these views are deep-seated in societal beliefs about perceived hierarchical importance of the healthcare professions.

Whilst there was inequality of importance attributed to some professions, this was not reflected in the views of students from those same lower rated professions. All the healthcare professions that were rated low by other professions, without exception rated their own importance as very high. Probably this is to be expected among students who are quite likely to be enthusiastic about starting their new courses, and who present with high strength of professional identification with their own professions as was the case

among this student cohort. It appears possible that stereotypical societal beliefs could be modified by virtue of being a member of a profession of choice, by experiences during the first year of the course, or through the development of professional identity with that profession which is considered in the next section.

7.7 Professional identification among undergraduate healthcare students

Evidence that undergraduate students could benefit from IPE early in their courses is emerging (Gallagher and Gallagher, 2012; Reeves *et al.* 2016), but this has materialised as a dilemma in the literature. Whilst many studies suggested that early IPE could take advantage of students' positivity towards shared learning; they also voiced concerns about the effectiveness of IPE if students have a weak/unformed professional identity, arguing that IPE would be best initiated later on in the course, or nearer to graduation (Funnell 1995; Pollard *et al.* 2006; Mc Fadyen *et al.* 2010; Stull and Blue 2016). This argument features as one of the prominent debates in the IPE literature in terms of IPE design, and this study now adds to this from an Irish perspective. Professional identity develops over time and involves taking on the values, practices and skills of the profession and undertaking the professional roles akin to the group (Schein 1978). On that basis it seems natural to assume that students would enter their courses with weak, unformulated identity with their own profession.

However, in this study the healthcare students presented with a strong collective professional identity[30] on course commencement (section 6.3.2), and strong individual group identities (section 6.3.2.1), as measured by the use of the well validated and reliable Professional Identity Scale (PIS) (Brown *et al.* (1986). These findings are reflected in and corroborate both early and recent literature in the IPE field (Hind *et al.* 2003; Adams *et al.* 2006; Coster *et al.* 2008; Stull and Blue 2016), and are in keeping with the underlying premise of Social Identity Theory (SIT) which contends that members of a group favour the participants in their own 'in-group' over the other participants in the 'out-group' (Tajfel 1978; Turner 1999). The vast majority of students in this study (80%) reported that their current course was their first choice (section 6.2.2.4) so it is reasonable to assume that the students were enthusiastic. Whilst these high scores need to be interpreted with some caution as they could be affected by natural enthusiasm and motivation, they were however sustained into the second year. This represents a positive finding in support of early IPE, on the basis of many arguments spanning three decades in the literature which assert that for IPE to be effective, students need to have a formulated identification with their own profession (Mazur *et al.* 1979; Funnell 1995; Parsell and Bligh 1998; Tunstall-Pedoe *et al.* 2003; Oandasan *et al.* 2004; Baker *et al.* 2011; Stull and Blue 2016).

Barnes *et al.* (2000) and Adams *et al.* (2006) reported very little demarcation between healthcare groups for strength of professional identity. However, in this study there were significant differences between the disciplines, revealing that medical students had statistically significant lower professional identity scores than all other groups ($P<.01$),

[30] Collective identity is measured by a composite score for the entire cohort involving the six healthcare professions.

with the exception of pharmacy. Physiotherapy students presented with the highest strength of professional identity with the lowest standard deviation and this was sustained into the second year (section 6.3.2.1). These differences could be attributed to the fact some students worked in healthcare alongside their profession of choice prior to course commencement and some had relatives who were healthcare professionals (Table 6.3). With findings very similar to this study, Horsburgh *et al.* (2001) and Hind et al (2003) also reported that medical students had less positive attitudes to IPE than other groups, and also appeared least assured of their role of expertise with lower scores on identity reported by Hind *et al.* (2003). Congruent with this study, Hood *et al.* (2014) reported stronger professional identity among nursing students than medical students. The sustained high comparator group scores are suggestive that students perhaps in general enter their courses with high professional identity and sustain this over time, thus indicating this is not just a phenomenon associated with healthcare education.

The fundamental issue and dilemma for IPE as regards these differences is that they give rise to the question of how IPE activities can take account of differences in strength of professional identities between the professions to yield best learning outcomes. It is of interest also that the medical students in this study presented with lower strength of professional identity, lower readiness to learn interprofessionally, and rated the other healthcare disciplines lower for importance on the IPW team. It seems counterintuitive somehow, that despite having the highest perceived status by other professions, highest in-group ratings for importance on the IPW team, rated their own profession more highly on professional attributes, and believed they had to acquire more knowledge than the other professions, they still revealed lowest strength of professional

identification with their own group. However as social psychology theory suggests, membership of a healthcare professional group is not only a sociological state but also a psychological state (Taifel 1971; Turner 1999). Perhaps lower strength of identity has something to do with medical students feeling overwhelmed as reported by Michalec *et al.* (2013), or has some association with the medical students also appearing less confident at T2; a finding which emerged among the autostereotypes after the first year which will now be examined.

7.8 The views undergraduate students hold for their own and other healthcare professions

It is reasonably well documented in the literature that the views students hold for their own (autostereotypes), and other professions (heterostereotypes), are factors which impact on both effective IPW, and on the potential success of IPE (Carpenter, 1995a, 1995b; Carpenter and Hewstone, 1996; Leavis 2000; Reeves 2000; Cooke *et al.* 2003; Tunstall-Pedoe *et al.* 2003; Hind *et al.* 2003; Mandy et al 2004; Rudland and Mires 2005; Lindqvist *et al.* 2005a; Hean *et al.* 2006a; Hammick *et al.* 2007; Lidskog *et al.* 2008). Therefore, stereotypes are an important consideration for the goal of effective IPW through IPE. This study elicited information about how the healthcare students rated their own and other professional groups on nine professional attributes of 'academic ability', 'professional competence', 'interpersonal skills', 'leadership ability', 'ability to work independently, 'ability to be a team player, 'ability to make decisions', 'practical skills' and 'confidence'. The objectives were to discover if, in the first instance, healthcare students entered their respective courses with stereotyped views of their own and other professions, then endeavour to understand these views through

identifying similarities and differences between perceptions of professional attributes between and within the six professions, and then ascertain as to whether or not such views changed during the first year of their healthcare courses. A unique feature of this study was the inclusion of a non-healthcare comparator group to assist with understanding the origin of stereotypes, and ascertain if these stereotypes were exclusive to a healthcare student cohort. The stereotypical attitudes are of significance and are given detailed consideration in this section because they have serious implications for the pursuit of effective IPE and IPW for safe, quality patient/client care in Ireland.

There is ample and growing global support for the claim that healthcare students enter their respective courses with pre-defined stereotypes about their own and other healthcare professions (Hind *et al.* 2003; Cooke *et al.* 2003; Mandy *et al.* 2004; Lindqvist *et al.* 2005a; Rutland and Mires 2005; Hean *et al.* 2006a; Ajjawi *et al.* 2009; Bradley *et al.* 2009; Hansson *et al.* 2010; Ateah *et al.* 2011; Michalec *et al.* 2013; Foster and Macleod Clark 2015), and in line with Social Identity Theory, these are played out during their intergroup interactions (Tajfel 1978; Turner 1999; Hean *et al.* 2006a). As a natural consequence of social categorisation; a fundamental part of the socialisation process (Judd and Park 1993; Tajfel 1978), stereotyping of professional healthcare groups was correctly anticipated among these students. Through the use of the well validated and reliable Student Stereotype Rating Questionnaire (SSRQ) (Hean *et al.* 2006a), this study now adds to the body of evidence from an Irish perspective.

Trends among professional characteristics and stereotype profiles within the healthcare professions

In line with current literature, the autostereotypes and heterostereotypes ratings among the students in this study shared outstanding divergence. In general, all the healthcare professions attributed high range scores to their own discipline on all characteristics at both timepoints (section 6.3.4). Conversely however, low range scores were only observed among the heterostereotypes. These findings share similarities with studies by Parker and Chan (1986), Hind *et al.* (2003), Mandy *et al.* (2004), Hean *et al.* (2006a) also reporting that students rate their own professions higher than others. It is hardly surprising that these neophyte healthcare students presented with positive views on the professional characteristics of their own professions, particularly as the professional identity of these students was high on course entry and remained high into the second year. Furthermore, as was the case in the study by Hind *et al.* (2003) strength of professional identity significantly correlated with autostereotypes for most groups.

Stereotype profiles have emerged among professional heterostereotypes in other studies (Carpenter, 1995b; Barnes *et al.* 2000; Tunstall-Pedoe *et al.* 2003; Hind *et al.* 2003; Lindqvist *et al.* 2005a; Hean *et al.* 2006a; Foster and Macleod Clarke 2015). This study has captured a very similar scenario in the context of Irish healthcare education, revealing stereotype profiles attributed with remarkable consistency to the different professions at each timepoint. They are also remarkably comparable to the non-healthcare comparator group at T1, thus indicating these stereotypes are probably as much a product of society as association with a professional healthcare group per se. The stereotype profile patterns that emerged in this study are best visualised among the

colour-coded clusters representing low (blue), medium (green), and high (cream) ratings on the nine professional characteristics presented on table 6.15, and figure 6.6 and 6.7.

The students in this study portrayed very clear distinctions between professional groups on certain attributes, and shared similarities on particular ones with other studies. On the attribute of 'academic ability', the findings particularly resonate with studies by Carpenter (1995), Barnes *et al.* (2000), Tunstall-Pedoe *et al.* (2003), Rudland and Miers (2005), Hean *et al.* (2006a) and Michalec *et al.* (2013). There are also marked similarities with the control group data in the study by Foster and Macleod-Clarke (2015), and with the baseline data in the study by Ateah *et al.* (2011). Doctors and pharmacists were perceived to be the most academically capable, whereas the nurse was perceived to be much lower on 'academic ability', a finding which is in contrast to that reported by Ateah *et al.* (2011) who atypically report high ratings for all these professions on this characteristic. The lower ratings on academic ability could be reminiscent of a time when nurses historically did not a require university based education and academic requirements for entry were lower by comparison to contemporary nurse education. They could also have a basis in reality insofar as the academic requirements are not as high as other professions, and students may assume this automatically translates to lower academic ability among this group. This stereotype could also have a basis in the historical origin of the nursing profession, reminiscent of a time when the service based profession of nursing was viewed as subsidiary to the medical profession and seen to involve more 'menial' tasks related to caring that were not held in the same esteem as the more technical and medical aspects of patient care (Kulys and Davis, 1987; Hall 2005; Baldwin 2007). Students' qualitative comments which were associated with influences prior to course

commencement echo this stereotype. One pharmacy student echoed a common perception about the nursing role as 'practical' and 'caring':

' 'nurses are practical, competent and good at teamwork with good people skills and very empathetic'

One physiotherapy student commented:

'learned through hospital experience that nurses are undervalued and saw big barrier between doctors and nurses'

Other student nurses believed or experienced the following:

'maybe I am just imagining it but I felt that we were the lesser profession when on rounds with the medics. The other professions were asked their opinion and seemed to do all the talking'

'sometimes puts nurses down but speaks highly of paramedics'

' heard nurses are not treated right'

' learned about how nurses' status compares to doctors'

(Section 6.2.3).

Corresponding also with aforementioned studies, the nurse was perceived to have better interpersonal skills than either doctors or pharmacists. The stereotype of the 'uncommunicative' pharmacist is thought to have been reinforced in society because pharmacists were prohibited from discussing illness and diagnosis with patients, serving primarily to dispense medications ordered by the doctor (Baldwin *et al.* 1983). Furthermore, these findings could lend some validity to the assertions by Henman

(2008) and Gallagher and Gallagher (2012) who ascertained that the Primary Care Strategy launched in 2004 by the Department of Health and children in Ireland barely recognised the pharmacist as a participant in the process of care. The power of legislation to generate and prolong stereotypes is underscored here. However, Gallagher and Gallagher (2012) reported a lack of communication skills training for Irish pharmacists so these attitudes could have some basis in reality as well as stereotype. The stereotypes as they relate to the pharmacist were evident in one comment by a physiotherapy student at T1 which was based on influences from a relative healthcare professional:

'pharmacists are highly qualified but can't diagnose patients'

(Section 6.2.3).

Congruent with Ateah *et al.* (2011), interpersonal skills were rated highly in this study for physiotherapists and occupational therapists. However, the high ratings did not extend to the dietician who received medium ratings on this attribute. This seemed unusual given that these professions are often homogenously grouped together (Baldwin 2007; Baker *et al.* 2011). Lending support to the Contact Hypothesis (Allport 1954), different geographical locations of the academic/clinical sites for these professions could be a possible explanation for this finding. More social interaction which can reduce the formation of prejudices towards the culture of others (Allport 1954) could have taken place between the physiotherapy and occupational therapy students, who at the time of this study, were housed in the same academic and clinical venue.

For the 'leadership ability' characteristic, these results are again similar to Hean *et al.* (2006a), Ateah *et al.* (2011) Michalec *et al.* (2013) and Foster and Macleod-Clarke (2015), whereby doctors received high ratings, and the nurse and the occupational

therapist receiving low ratings. In addition to this evidence, this study also found low ratings on leadership ability for the dietician. It is somewhat paradoxical that the nurse and occupational therapist received high ratings for IPW team membership, but yet were not considered able to lead the team, perceptions that were also reported by Michalec *et al.* (2013). On the basis that the students rated the doctor highest for leadership ability, perhaps they believe there can only be one person in charge of patient/client care and only one leader on the IPW team. As with other studies, low ratings were given for the pharmacist on leadership (Ateah *et al.* 2011; Michalec *et al.* 2013; Foster and Macleod-Clarke 2015). It could well be that the students perceived the role of the pharmacist as simply administering medications under the direction of the doctor, one that does not assume any type of leadership role per se. These findings are mirrored in the lower rating on perceived importance of the pharmacist and the dietician on the IPW team (section 6.3.1.1).

As in studies by Hean *et al.* (2006a) and Foster and Macleod-Clarke (2015), the greatest differentiation on 'ability to work independently' was seen between the nurse who was rated low, and the doctor and pharmacist who were both rated high. It is perplexing that the nurse was the only professional given a low category rating on this attribute. Low ratings for nurses on 'ability to work independently' were also reported by Ateah *et al.* (2011). Statistically significant decreases on this attribute were seen for the physiotherapist after one year ($P<0.01$), and very slight, not statistically significant decreases were observed among all professions except for nursing (Table 6.15). This could suggest that during the course of their study and experiences, the healthcare students realised that interdependence is critical between healthcare professionals for effective teamwork, hence lower ratings for the professions on this characteristic were

assigned. Alternatively other factors could be of influence. The sustained low category rating attributed to nursing on 'ability to work independently', could have been again influenced by the stereotype that nursing is subservient to other professions such as medicine, and functions to provide support for doctors (Kulys and Davis 1987; Carpenter 1995a; Hall 2005; Baldwin 2007).

The characteristic 'ability to make decisions' saw highest ratings among doctors, pharmacists and physiotherapists, and lowest ratings given to nurses. This finding is congruent with Hean *et al.* (2006a), Ateah *et al.* (2011) and Foster and Macleod-Clarke (2015), again possibly reminiscent of historical perceptions about subservience within this profession. This study also found similar medium range scores for nurses, occupational therapists and dieticians on this attribute. Congruent with Hean *et al.* (2006a) and Foster and Macleod-Clarke (2015), ratings for the characteristics of 'professional competence' and 'confidence' were high across all groups. In this study all professions achieved high to medium ratings for 'practical skills' indicating recognition among these first year students for existing skill and expertise among healthcare professionals in the Irish healthcare system.

As also seen in previous studies (Rudland and Miers 2005; Ateah *et al.* 2011), the findings for the nursing profession are of particular interest in this study. Heterostereotypes ratings by the healthcare group for the nurse on academic ability, revealed a highly significant increase between the two timepoints with the scores increasing from a low to medium range of ability. In contrast, a significant decrease in the same rating was attributed by the non-healthcare comparator group. This could mean that the healthcare students' experiences of the nursing group, whether in the clinical or academic environment, could have had a positive influence on original

stereotyped views which students presented with on course commencement. This change of viewpoint is unique to the non-nurse healthcare professionals as opposed to the nursing group, who already attributed a high rating to their own profession on academic ability at both timepoints. It is also of interest to note that Foster and Macleod Clarke (2015) reported a significant decrease on the 'academic ability' characteristics for nurses in their intervention group which experienced an IPE intervention, whilst in this study the attitudes improved without IPE. Taken together, these somewhat paradoxical findings possibly underscore the need to select IPE programmes that will not reinforce negative stereotyping among the students.

Differentiation on the characteristics between the traditionally labelled 'allied healthcare professions' which in this study included physiotherapy, occupational therapy and dietetics, was also of particular interest. This study found that the autostereotypes, heterostereotypes and non-healthcare comparator ratings of characteristics for the dietician and occupational therapist, exhibited confused and possibly distorted perspectives as evidenced by the large quantity of midrange scores (color coded green Table 6.15). There appears to be role confusion and misapprehension among this group and about this group. As the 'allied healthcare professions' evolved much later than the medical and nursing professions, it could well be that there is still uncertainty surrounding the roles and abilities of these groups (Baldwin 2007). This idea is corroborated by the lower ratings they received than nurses and doctors for perceived importance on the IPW team. A student nurse commented at the first timepoint:

'I definitely think we should learn with the doctor but don't feel a need to learn with occupational therapists or dieticians but then I'm not too sure what they do'

(Section 6.2.3).

The dietician and occupational therapist received lower ratings than the physiotherapist on both academic and decision making ability. The stereotype profile for the physiotherapist in this study appeared to be more akin to that of medicine and pharmacy, rather than occupational therapy and dietetics. Out of the three groups, the occupational therapist and in particular the dietician, received mostly lower to medium range scores, whereas the physiotherapist received remarkably greater number of scores in the high range category. Similar findings have been previously reported in other studies (Mandy *et al.* 2004), but are in contrast with Foster and Macleod Clarke (2015) whereby ratings for the occupational therapist and physiotherapists were more similar across the nine characteristics. There were no significant increases among the autostereotypes for occupational therapy or dietetics, whereas physiotherapists rated their own academic ability and professional competence significantly higher the second time round, albeit original scores were already in the high range category ($P<.01$). There is something about this profession that sees it standing out with greater autonomy and status than occupational therapy and dietetics, also reflected in the professional identity scores that were the strongest out of all the groups at both timepoints (section 6.3.2.1). It could well be, as suggested by Mandy *et al.* (2004), that the profession of physiotherapy is considered more prestigious in the minds of society given its association with sports and athletics. Indeed, occupational therapy and dietetics could be still reeling more so than physiotherapy from the aftermath of been placed under the umbrella term of 'allied healthcare professions'. The use of terminology could have lost these professions both autonomy and standing among the healthcare professions in general (Gilbert 2005a; Baker 2011).

There was, however, some moderation of views observed among the heterostereotypes between the first and second data collection point in this study. Improved perceptions of the nurse were seen for 'academic ability' and 'leadership ability', with both characteristics significantly increasing over time from low to medium range scores, a finding also reported by Ateah et al (2011), albeit this was following an IPE intervention. These results are in contrast to those reported by Foster and Macleod Clarke (2015). However, in keeping with Foster and Macleod Clarke (2015) there was no difference observed in the lower ratings attributed to doctors and pharmacists on the 'interpersonal skills' characteristic. Considerable moderation of views was seen on the attribute of 'team player'. A significant decrease from high to medium was observed for the doctor, whereas the pharmacist obtained significantly higher scores from low to medium. Significant increases were also observed for the physiotherapist, occupational therapist and dietician. Nurses remained high as in the previous year.

Although moderation of ratings was observed between the timepoints, some stereotypes appeared entrenched still in the minds of the students after the year, a finding also reported by Foster and Macleod Clarke (2015). There was a significant increase for the nurse on academic ability. However, the nurse was still rated as less academically capable than the doctor, physiotherapist and pharmacist, albeit now joining dieticians and occupational therapists in the medium range category of scores. Both healthcare and comparator group students retained their original stereotypical beliefs on the 'interpersonal skills' characteristic, with both doctor and pharmacist remaining within medium and low range categories respectively, thus spotlighting just how deeply entrenched this popular stereotyped belief was in the minds of the students. As reported by Ateah *et al.* (2011), the increased positive views of nursing could be a result of

experiences and knowledge gained on the healthcare courses which perhaps through informal IPE, enabled the students to better understand the nurses' role. An alternative explanation for the apparent decreases among some attributes is that views could have become more realistic in the light of experiences. Foster and Macleod Clarke (2015) reported greater realism after an IPE intervention, but it is quite likely that the same dynamic occurred among these healthcare students brought about by clinical and/or academic experiences and/or informal IPE.

Autostereotypes are also important to examine because how professionals view their peers may influence professional practice and IPW after graduation. In this study, less modification overall was seen between the timepoints among the autostereotypes than the heterostereotypes, indicating that the students held onto their original strong views about their own profession. Some moderations were observed however (table 6.15). Significant lower changes occurred within the nursing group on the attribute of 'team player' ($P<0.01$); lower within the medical group on 'confidence' ($P<0.05$); and higher for physiotherapy on both 'academic ability' ($P<0.01$) and 'professional competence' ($P<0.05$). As mentioned previously this group appears to be evolving with remarkable autonomy and confidence. The attribute of 'team player' significantly decreased in ratings for nurses, albeit the ratings remained in the high range. Since this group experienced clinical placements, this raises the question of whether or not they felt they received the necessary support from the nursing staff, or felt part of that team while on clinical placements. The feelings voiced by two nurses corroborate this point:

'*some qualified nurses don't seem to want students on the nursing team'*

'sometimes nurses don't work well with their own professions never mind work well with others' (section 6.2.3)

As a facilitator of an education module that explores the positive and negative aspects of the clinical learning environment, the researcher has experienced anecdotally similar concerns expressed by student nurses over the years.

It is very much in contrast with the literature that the first year medical students rated their own profession low on many attributes, as was seen among the autostereotypes in the study by Michalec *et al.* (2013), who rather than accept this finding as a true representation of students' views, interpreted this finding as a portrayal of a socially desirable '*veil of Humility'* (pg. 212), or a feeling of being overwhelmed by the early challenges encountered in their courses. However, this study observed a very different scenario whereby the medical students rated their own profession higher than any other. With that said as noted previously in section 7.5, there was a decline in self-rating of confidence among the medical students, albeit this score still remained within the high range (Table 6.15). Pre-course influences and societal beliefs surrounding the high status and prominence of the medical profession, could have provoked unrealistically high confidence levels on course commencement among the students, which in the face of reality could quite easily deteriorate; what Foster and Macleod Clark (2015) regard as heightened realism. A slight decline was observed also within the heterostereotypes ratings for medicine on the same attribute. Non-medical students' assumptions about the confidence levels for the doctor could also have been unrealistically high on course commencement for the same reasons, and students who may have encountered medical students on clinical placement, may have realised these students had insecurities just like any other student.

The perspectives among the non-healthcare students on the professional characteristics were also examined and compared to the healthcare group. No other studies were found

to date that used a non-healthcare comparator group to compare modification of stereotypes among healthcare students. The similarities and differences on attribute ratings by the comparator group were of interest because they consistently mirrored the healthcare group by attributing higher ratings on 'academic ability' for the doctor, pharmacist and physiotherapist. They also had remarkably similar lower ratings on the characteristics of 'interpersonal skills' for the doctor, pharmacist and dietician. Comparable ratings were evident across all professions on 'leadership ability' (table 6.15). Other similarities were observed on 'ability to work independently' for the nurse and occupational therapist; on 'team player' for the doctor and pharmacist; and on 'decision making' for the nurse, occupational therapist and dietician. The overall higher scale ratings for doctors, and the overall lower scale ratings for occupational therapists/dieticians that were observed generally among the healthcare group, were also reflected in the scores by the comparator group. These resemblances suggest that the views are not necessarily unique to the healthcare groups, and as noted by Curran *et al.* (2008), are more likely to be a product of the stereotypical beliefs that wider society hold about the healthcare professions which will be considered in more detail in the next section.

However, the moderation of stereotypes over time observed within the healthcare group, were not all apparent among the views of the comparator. As aforementioned, the increased ratings on 'academic ability' and 'leadership ability' for the nurse; and on 'team player' for the pharmacist and physiotherapist, were not observed among the comparator group ratings. Neither were the decreases on the attribute of 'team player' for the doctor. This further corroborates the idea that the original views of the healthcare students were possibly influenced by the clinical, academic and/or social

experiences, the hidden curriculum, and/or possibly the course philosophies unique to the healthcare courses.

Implications of stereotyped perspectives and inequalities about healthcare professions for interprofessional education and working

The question of whether IPE has the potential to reduce stereotypes has engendered much debate for many years. Considering the findings through the lens of social psychology theory, although some modifications were observed in this study, stereotypes were still retained into the second year indicating sustained use of stereotyping among these students to direct their intergroup interactions (Turner 1999). This supports the argument put forward by Brown and Hewstone (2005) asserting that stereotypes can be impervious to change and contact may not have a particularly strong impact upon them.

There is as yet no consensus between before and after studies on just how effective IPE is for positively changing negative attitudes and beliefs based on stereotypes. The findings at the first timepoint in this study are most comparable to those reported by Hind *et al.* (2003), Mandy *et al.* (2004), Rudland and Miers (2005), Hean *et al.* (2006a) and Michalec *et al.* (2013), who also did not investigate the impact that exposure to formal IPE could have had on stereotypes. However, it is of interest that the heterostereotypes ratings reported in this study happen to share many similarities with studies that did use an IPE intervention (Ateah *et al.* 2011; Foster and Macleod Clark 2015). On that basis these findings somewhat challenge the assertions by Ateah *et al.* (2011) in their claim that significant positive changes most likely occurred as a result of IPE, since the findings in this study also showed very similar positive moderations of views without IPE. Further doubt emerges about the usefulness of IPE when the

findings by Foster and Macleod Clarke (2015) are considered. Whilst Ateah *et al.* (2011) reported increased positivity for other professions after IPE, Foster and Macleod Clarke (2015) reported retention of negative stereotypical beliefs among their students after IPE.

As with those aforementioned, other recent studies argued IPE did not moderate stereotypes to any great extent or positively affect students' attitudes (Ajjawi *et al.* 2009; Hansson *et al.* 2010; Stull and Blue 2016). Worryingly, some claim that negative stereotyping appeared to be reinforced by IPE (Tunstall-Pedoe *et al.* 2003). With that said, there appears to be enough evidence emerging in support of positive moderations in stereotypes after IPE, or at least an improvement in understanding of the roles and responsibilities of the other professions (Nisbet *et al.* 2008; Lidskog *et al.* 2008); Jacobsen and Lindqvist, 2009; Bradley *et al.* 2009; Ateah *et al.* 2011; Hawkes *et al.* 2013). However, these disparities place a question mark over the effectiveness of some types of IPE interventions, and it is not entirely clear from many studies whether IPE was ineffective because of its type or design, and/or the attitudes of participants. As Foster and Macleod Clarke (2015) pointed out, it is difficult to effectively compile evidence or draw conclusions as to the benefit of IPE on attitudes or stereotypes to date. This is because of the multiple variations in type and duration of IPE interventions, and the wide variation in professional groups and institutions involved.

The process of professional socialisation among the participants in this study most likely began prior to course commencement, and many values, attitudes and beliefs appeared to be already formed (Melia 1987; Horsburgh *et al.* 2006). Furthermore, as evidenced by the high scores on professional identification at T1, it is likely that an amount of professional identity existed before these students commenced their courses.

It could therefore be expected that students with a high strength of professional identity enthusiastically embarking on their new careers, would present with more positive views of the qualities associated with their own profession than that of others. With that noted, the question of why students are not automatically inclined to rate other professions with corresponding equality of importance arises. Perceived inequality among healthcare students can affect attitudes to IPE and IPW and may have had impact in this study. If students felt a sense of inequality, it is quite likely that contact with other disciplines would not necessarily yield a positive change of views over time. A theme of inequality echoes quite prominently among the qualitative responses in this study (section 6.2.3: table 6.5). One student nurse at the second timepoint remarked:

'maybe I am just imagining it but I felt that we were the lesser profession when on rounds with the medics. The other professions were asked their opinion and seemed to do all the talking'

A student of occupational therapy remarked:

'I don't think we are seen as important as nurse or doctors. It is odd really but sometimes I think other professions don't understand what we do or even see us as professionals'

(Section 6.2.3)

Lidskog *et al.* (2008) strongly argued that inequality of status among the healthcare professions poses a significant barrier to effective teamwork and IPW. Likewise, it has been argued that healthcare students need to have a sense of equality with other disciplines to effectively engage with IPE (Parsell and Bligh, 1998; Tunstall-Pedoe *et al.* 2003; Lidskog *et al.* 2008; Wilhelmsson *et al.* 2011). These arguments are

theoretically supported by the Contact Hypothesis (Allport 1954) whereby equality is inherently a condition to affect positive change in stereotyped attitudes through discovery of shared similarities. Equality is also essential to prevent development of prejudices towards the culture of others during interactions (Allport 1954 and 1979; Hewstone and Brown 1986; Hewstone *et al.* 1994). Without a sense of equality, some student disciplines could be subjected to a feeling of low collective esteem as pointed out by Takase *et al.* (2001) in the context of the nursing profession. They may also become less inclined to enthuse about the prospect of IPE as was seen in earlier studies (Nisbet *et al.* 2008; Ajjawi *et al.* 2009; Hansson *et al.* 2010). Perceptions of subservience and inequality of status within the nursing profession were alluded to among some students comment at T1. A physiotherapy student commented:

'nurses do lot of work and show junior doctors how things are done. Dr's rely on the nurses'

An occupational therapy student remarked:

' wouldn't go into nursing due to system, weak union ,tough job, low pay'

(Section 6.2.3)

Baker *et al.* (2011) found that some doctors considered IPE a possible threat to their professional status. In contrast, non-medical professionals viewed learning with doctors as an opportunity to improve their own positions within the healthcare professions. IPE seemed to cause competition instead of collaboration between the qualified participants in that study because of the sense of supremacy held for the medical profession that is rooted in tradition.

At this point in the discussion, the historical evolvement of the healthcare professions is worth briefly considering because it helps to explain the origin of stereotypes. In this study the low ratings attributed to nurses and to a lesser extent occupational therapists and dieticians on certain attributes such as academic ability (Table 6.15), could have been influenced by territorial power and authority exerted by the traditionally dominant medical profession, and could be reminiscent of subservience. Viewed as a dependent role, nursing was underpinned by traditional statutory requirements and hospital regulations which required nurses to function namely as a support for doctors and serve under their direction (Kulys and Davis, 1987; Hall 2005; Baldwin 2007). The similar ratings by the non-healthcare comparator group at both timepoints (Table 6.15) possibly indicate these traditional beliefs remain somewhat entrenched within the mind-set of wider society. However, territories are dynamic and ever changing. Nurse practitioners, therapists and technicians can effectively deliver many of the original services that were once held within the realm of the medical profession. Baldwin (2007) argues this has threatened the power and authority of the medical profession and its long standing history of hegemonic status. Stereotypes still prevail and these study findings are suggestive that the aforementioned power dynamics are still at play. The stereotyped attitudes expressed among these study participants could be a sign that society has not quite yet 'caught up' with the changing healthcare system that now, more than ever, requires the globally recognised need for cohesion and collaborative working between the different healthcare professions so to improve standards of care.

The results of this study support earlier claims in the literature that unequal power relations remain at play between the healthcare professions (Witz 1990; Zelek and Philips 2003; Hall 2005; Baldwin 2007; Baker *et al.* 2011). The dynamics of power

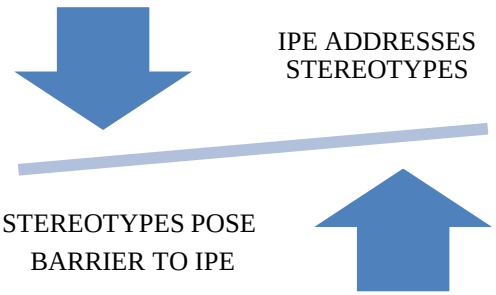
relations are evident among these students' perspectives and experiences at course commencement and during the first year, as are the stereotypical views about traditional professional hierarchy and the prestige of some professions over others (Baldwin 2007; Baker *et al.* 2011). At this juncture a further point of interest is worth mentioning given the gender differences noted among attitudes expressed by these students. The status attributed to certain professions has traditionally been constructed around gender lines (Bell *et al.* 2014). The gender privilege men had in society to be educated brought about their dominance in healthcare (Hall 2005). Bell *et al.* (2014) vehemently argues that this remains an issue today in our healthcare systems, albeit perhaps not to as great an extent given the gender balances now evident within the professions of pharmacy and medicine. Underlying historical influences relating to gender and professional status, reminiscent of a time when doctors used education to increase their own authority and power, and keep women out of medicine (Witz 1990; 1992), may still be of influence to this day. In this study males and doctors presented with lower scores for IPW and readiness for IPE, and this could have genesis in the traditional gendered hierarchical healthcare system; a system that has been described among IPE champions as one that has been '*built by men for men'* and one that males perhaps are less inclined to change (Zelek and Philips 2003, Wilhelmsson *et al.* 2011:8).

Hence, whilst there is much support for IPE as a key process in enhancing communication and collaboration among healthcare professionals to improve both delivery and quality of patient/client care, these unequal power relations threaten the success of its goals. Accomplishing effective IPE and IPW clearly becomes more complex in the face of perceptions of supremacy among the participating professions. The findings in this study are therefore a matter of great concern. The higher academic

ability among students' perceptions about the doctor, pharmacist and physiotherapist, reflect inequalities that could arguably impede the success of IPE and IPW. The inequalities are particularly evident in the case of doctors who overall obtained the highest autostereotypes and heterostereotypes ratings, with the vast majority of scores observed in the high range. Furthermore, their lesser scores on the attributes of interpersonal skills and team player fell within the medium range leaving them a unique group insofar as they received no low range scores by either the healthcare or non-healthcare comparator at either timepoint. These perceptions corroborate the findings discussed earlier whereby the doctor was championed as the most important healthcare professional on the team.

In view of these findings, preventing inequality from becoming a barrier to effective IPE and IPW poses an immense challenge for IPE champions, and there appears little by way of suggestion of how to counteract this problem in the literature. These results spotlight a paradoxical situation of opposing forces whereby the very goals of IPE to address stereotypes, are counterbalanced by their very existence (figure 7.2).

Figure 7.2 Paradoxical counterbalance of opposing forces



Perhaps stereotypes should be unpicked and interrogated on their very nature and origin prior to involving students in IPE?

An interesting, albeit radical suggestion was put forward by Rudland and Mires (2005) and Michalec *et al.* (2013) to counteract the negative implications of admitting students to healthcare courses with 'incorrect stereotypes'. The authors suggested that attitudes should be assessed as part of course admission criteria to ensure they are conducive to interprofessional teamwork. Whilst perhaps logically making sense, the practicality of such an approach might be questionable and difficult to execute in reality. Wilhelmsson *et al.* (2011) recommended that particular efforts need to be directed at males and medical students to emphasise the importance of equality and teamwork. Since the beliefs among participants in this study appear to be 'profession associated' and somewhat 'gendered', this notion holds some merit. However, it possibly represents a rather narrow view of how best to address the problem of inequality. It could be argued that targeting particular groups according to healthcare profession and gender constitutes inequality in another form.

There is a great deal to consider when collectively considering all findings in this study relating to stereotypes and it is challenging to compare and contrast these given their complexity. Perhaps all healthcare professions and males and females alike need to be equally engaged in the interrogation of their pre-conceived stereotypes whether positive of negative. This is because the positive stereotyping on the attributes of academic ability directed at doctors and pharmacists could be just as destructive to the goals of IPE as the negative stereotyping on the attributes of interpersonal skills and team player. This could also hold true for any negative in-group ratings, such as those observed

among the autostereotypes held by nursing students on the attribute of team player for their own profession.

7.9 Readiness to learn interprofessionally among the healthcare professions

The previous sections in this chapter considered the significance of attitudes as they relate to IPW and students own and other professions in light of what is already known about the issue. The strength of identification among students for their profession of choice was deliberated through the lens of social psychology theories that help to explain the group dynamics and processes involved. Findings as they relate to the concept of undergraduate healthcare students' readiness to learn interprofessionally will now be considered, and new understandings or insights that may have significance for the design and implementation of effective IPE will be elucidated.

Sustained positivity for shared learning

A fundamental finding that emerged from this study was the positive attitudes to IPE within this group of first year healthcare students on entry to their courses (section 6.3.3). This seems surprising alongside strong professional group identification and stereotyped attitudes, some of which were negative towards other professions. However, this positivity on readiness for IPE is mirrored in the high value for IPW seen among the sustained and significantly higher scores on the IPWS at the second timepoint (section 6.3.1.4). Positive attitudes to IPE and positive outcomes of IPE have been associated with positive attitudes and positive outcomes for IPW (Campbell *et al.* 2001; Morey *et al.* 2002; Young *et al.* 2005; Curran *et al.* 2008; Pollard and Miers

2008; Reeves *et al.* 2009), making this a promising outlook for the development of effective IPW skills between healthcare graduates through IPE advancement in this institution, and potentially in other HEI's in Ireland.

Overall mean scores on readiness for IPE were very high at 82.4% (78.29 of a maximum possible score of 95). These findings are congruent with high scores previously reported in many other studies and build upon an existing body of global evidence from an Irish perspective. Rose *et al.* (2009) in their North American study involving nursing, medicine, occupational therapy and physical therapy students reported composite scores over 70%, and more recently Hood *et al.* (2014) in their Australian study involving nursing, medicine, physiotherapy and dietetics students report composite scores of 72%. Likewise, the UK study by Coster *et al.* (2008) reported scores ranging between 76% and 82%. Other studies reporting high scores/positivity for IPE at course commencement include Horsburgh *et al.* (2001), Hind *et al.* (2003), Tunstall-Pedoe *et al.* (2003), Rudland and Mires (2005), Pollard *et al.* (2006), Curran *et al.* (2008), Curran *et al.* (2010), McFadyen *et al.* (2010) Wilhelmsson *et al.* (2011) and others since commencement of this study include, Ahmad *et al.* (2013), Cahill *et al.* 2013; Millar *et al.* 2013; Hood *et al.* (2014), Wong *et al.* (2016), Talwalker *et al.* (2016) and Stull and Blue (2016).

It is of interest in this study that scores remained high into the beginning of the second year (table 6.12), thus representing a very positive finding which is in contrast with other studies reporting a decline in attitudes to IPE (Tunstall-Pedoe *et al.* 2003; Coster *et al.* 2008; Pollard *et al.* 2004; Pollard *et al.* 2006; McFadyen *et al.* 2010; Curran *et al.* 2010; Stull and Blue 2016). However, it needs to be noted that declining attitudes in the aforementioned studies occurred after a formal IPE intervention.

There are possible reasons for the sustained positivity among the students in this study. As previously discussed, the Contact Hypothesis asserts that individuals who interact with each other are less likely to develop prejudices towards the culture of others (Allport 1954). Sustained positivity could have had something to do with contact whereby students' either experienced unplanned or informal IPE through natural social contact, or out on clinical placement. Informal IPE was identified as beneficial by Freeth *et al.* (2005) for this reason. These experiences could have come about through shared journeys (Mu *et al.* 2004), during refreshment breaks (Morison *et al.* 2003), and generally through socialising with other disciplines (Reeves 2000). On the other hand, the absence of contact may have resulted in simply no change in what were already existing positive attitudes. As noted earlier in this chapter, the potential desire for greater contact with other disciplines is voiced by one student nurse who remarked:

'We don't get to be with any other students. We are isolated outside the campus and only met other students occasionally on the wards'

(Section 6.2.3)

One group however, did stand out as different at T2. Pharmacy was the only group to score significantly lower readiness at the second timepoint (P=0.004) (section 6.3.3.2). The score however, still remained within a high range (78 out of 95), and it would have been interesting to qualitatively unpick the potential reasons and/or relational dynamics further.

Another possible explanation for the sustained readiness for shared learning without IPE while others deteriorate with IPE, could relate to naivety among our junior students about the barriers and challenges actually involved in implementing and facilitating

IPE. The students in this study did not have a formal IPE experience, and it is very possible that sustained positivity for IPE was related to an idealistic view about the idea of it as reported in other studies (Tunstall-Pedoe *et al.* 2003; Pollard *et al.* 2006; Coster *et al.* 2008; McFadyen *et al.* 2010). Awareness of barriers associated with IPE can make participants potentially more critical about involvement with this type of educational experience (Pollard *et al.* 2006), and in the absence of IPE activities or reason to question this strategy of learning, students could have quite simply retained enthusiasm into the second year.

In the pioneering longitudinal study by Pollard *et al.* (2004, 2005, and 2006) it was noted that exposure to the practice environment can often give rise to negative student perceptions of interprofessional collaboration. However, in this study, it is reasonable to suggest that the retained high composite and individual group readiness scores (in all but one group) across the timepoints, may be an indicator of generally positive educational experiences provided by this institution and/or its affiliated clinical sites, which possibly fostered positivity among students towards other disciplines, or at least did not detract from original positive attitudes towards IPE. However, the compiled evidence showing high sustained willingness for shared learning without formal IPE as is the case with this study, and the decline in readiness with formal IPE reported in the aforementioned studies, is something of a paradox. There is cause for concern because as was seen among the heterostereotypes in the study by Foster and Macleod Clarke (2015), IPE can also have the potential to reinforce existing, or indeed produce new negative attitudes to other professions and this issue again emerged in the context of measurement of the concept of readiness for IPE.

When considered collectively, the findings from this and previous studies again raise questions about the potential value and usefulness of some IPE interventions, which appeared to have provoked negative attitudes to IPE instead of addressing them. If IPE generates negativity, it is in fact producing the opposite effect to its goal; once again creating the paradoxical counterbalance illustrated on figure 7.1. On an optimistic note, the recent evidence compiled from 46 studies in the systematic review by Reeves *et al.* (2016) concluded that generally healthcare students respond well to formal IPE. However, negative attitudes between professions can be most resistant to change following IPE and positive ones are not so easily sustained. Pollard *et al.* (2006) noted that negative attitudes can persist up to qualification, and Bradley *et al.* (2009) found that as early as four months, improved scores for readiness after IPE returned to pre-IPE levels. This is a vital consideration for those implementing IPE to be sure any positive effects of this endeavour are sustained into practice after graduation.

It appears important that students need support in order to sustain positivity. Students in this study intimated a need for support if they were to learn with other disciplines. Furthermore, lack of confidence to engage with other professionals was apparent. Similar findings were also reported in studies by Watts *et al.* (2007), Nisbet *et al.* (2008), Pollard and Miers (2008), Anderson and Thorpe 2008; and Bradley *et al.* (2009). Ajjawi *et al.* (2009) and Hansson *et al.* (2010) reported that non-medical groups experienced negative vibes from medical students. Concerns of this nature where expressed in this study whereby two nursing students indicated concern that the nursing profession is seen as subordinate among the higher status medical profession and bears much similarity to those reported by Bradley *et al.* (2009) (section 6.2.3). Some students mentioned they were concerned about learning with other disciplines that were

perceived to have better academic ability, with one students nurse voicing concerns about learning with other disciplines that require higher points to be accepted on their courses (section 6.2.3).

As aforementioned, IPE has been seen to potentially bring about deterioration in positivity and sometimes produce negative attitudes. On that basis it would appear important to ensure appropriate supports are in place for students who may be more anxious about shared learning to prevent existing positive attitudes from deteriorating. Pollard *et al.* (2006) observed that students need different support at various times during their courses arguing that an early experience of IPE which may result in students feeling disheartened or cynical is one such critical time for support. Another time for additional support appears to be in the second year whereby level of confidence in students' ability to collaborate effectively with peers from other disciplines has been found to decline (Pollard *et al.* 2006).

Timing of IPE

The debate continues about when is the best time to introduce IPE. Studies conducted two decades ago (Horder 1995; Carpenter 1995a; Parsell *et al.* 1998) reported positive outcomes for early shared learning and have been subsequently supported by recent research (Talwalker *et al.* 2016). The positivity that surfaced among the students in this study as evidenced by the high readiness scores could be harnessed and capitalised upon through early IPE in the first year. Furthermore comments from the students indicated that intuitively they felt IPE made good sense. Of those that did comment, the majority asked for IPE to be commenced early and continued throughout their program of study (section 6.2.3) which has been strongly suggested previously (Barr *et al.* 2005; Coster *et al.* 2008). The argument that early IPE could potentially modify attitudes to IPE and

IPW before stereotypes become entrenched and enable students to better understand their own and other professional roles from the beginning, is well represented in early and more recent literature (Horder 1995; Carpenter 1995b; Parsell et al 1998; Herzberg 1999; Leaviss 2000; Horsburgh *et al.* 2001; Hind *et al.* 2003; Barrett *et al.*, 2003; Cooper *et al.* 2005; Hean *et al.* 2006a; Coster *et al.* 2008; Nisbet *et al.* 2008; Anderson and Thorpe 2008; Ryan 2010; Ateah *et al.* 2011; Ryan 2010; Gallaher and Gallagher 2012; Hawkes *et al.* 2013; Hood *et al.* (2014).

Early IPE has already been recommended in Ireland by Ryan (2010), who through discussions with HEI educators noted medical students in particular had a deep-rooted sense of superiority from the beginning of their courses. IPE in the first year of study could also address the added complexity that comes with attempting to implement tis approach in later year in courses with different duration. The psyche of a fourth year student who is in their final year could be quite different to those who are also fourth year students, but with two years remaining to qualification. Nisbet *et al.* (2008) also called for early IPE interventions as they found senior students had difficulty with application of knowledge during IPE which may have been easier if they experienced it earlier in the academic program.

The influence of professional discipline on positivity for IPE

This study identified a highly significant difference in readiness for interprofessional learning between the medical students and the other professional groups at both timepoints ($P = <.001$). Based on Cohen's conventions for interpreting effect size (Cohen 1988), these differences were measured as large effect sizes (section 6.3.3.1). These findings are congruent with a wealth of older and contemporary literature also revealing differences between various professions on readiness/willingness for shared

learning and suggesting that for IPE to be effective, all professions involved need a degree of positivity and willingness to engage in interprofessional learning (Parsell and Bligh, 1999; Horsburgh *et al.* 2001; Tunstall-Pedoe *et al.* 2003; Pollard *et al.* 2004, 2005, 2006; Horsburgh *et al.* 2006; Curran *et al.* 2008; Coster *et al.* 2008; Rose *et al.* 2009; Curran *et al.* 2010; McFadyen *et al.* 2010; Ryan 2010; Baker *et al.* 2011; Wilhelmsson *et al.* 2011; (Hood *et al.* 2014; Ahmad *et al.* 2013; Keshtkaran *et al.* 2014; Judge *et al.* 2015; Wong *et al.* 2016; Talwalker *et al.* 2016; Jaideep *et al.* 2016). Congruent with this study, Coster et al (2008), Curran *et al.* (2010) and Wong *et al.* (2016) also found sustained lower scores over time among medical students. The 'non-medical' healthcare groups had no significantly different scores from each other on course commencement, but there were significant differences observed after the first year that revealed lower scores for pharmacy than dietetics (P= <.001) and occupational therapy (P= <.001), and the nursing group had statistically significant lower scores than dietetics (P= .008) (section 6.3.3.1). These changes are suggestive of influences on students' attitudes possibly resulting from clinical or academic learning or experiences taking place during the first year.

Differences between the professions in readiness/willingness for IPE that emerged in this study appears to reflect a global concern, with lower readiness for shared learning among medical students reported in Canada (Curran *et al.* 2008), New Zealand (Horsburgh *et al.* 2001 and 2006), Sweden (Wilhelmsson *et al.* 2011), United Kingdom (Coster *et al.* 2008), Iran (Keshtkaran *et al.* 2014), and United States (Judge *et al.* 2015). With completely opposite and somewhat counterintuitive results to these findings given the quantity of evidence reporting lower scores for medicine, it emerged from a study in Singapore that first year medical students had highest readiness for IPE scores and

appeared to value IPW more than nursing, pharmacy and dentistry students, and pharmacy had lowest (Ahmad *et al.* 2013). Cultural differences may have an impact.

Whilst the readiness scores were significantly lower among medical students than other disciplines in this study, there was also more variance as a group than any other healthcare disciplines indicating a greater disparity among student views. There were some very low scores on the RIPLS presented by a few students that would bias the group average. However, students with views radically opposing IPE are of concern as they could potentially limit the effectiveness of this educational intervention for the entire group, and it is of particular concern that these lower scores were sustained into the second year which spotlights entrenched viewpoints that could be difficult to change, as was seen among the stereotype ratings. Some comments by medical students in this study gave the impression that they felt unable to learn effectively with other professions, a finding also reported by Tunstall-Pedoe *et al.* (2003). These comments could be interpreted to have a basis in stereotypes. One medical student at the beginning of their second year remarked:

'*learning with nurses and other professions could undermine our own learning'*

However, others appeared more positive on reference to their previous healthcare experience saying they:

' learned importance of nurses and their responsibilities'

and had:

'more respect for nurses'

(Section 6.2.3).

Also appearing to have a basis in traditionally engineered stereotypes, the medical students were more likely to believe that the '*function of nurses and therapists is mainly to provide support for doctors*', and that they need to '*acquire much more knowledge than other healthcare students*' (section 6.3.3.3) at both timepoints. Since they did not appear to dissipate to any extent over time, these attitudes may have been reinforced by the academic programme/curricula/course philosophy, traditional beliefs about the status of the medical profession as discussed previously, and/or educators on the academic programmes. These findings spotlight a necessity to address these hierarchical and possibly distorted views early through course components that emphasise a collaborative focus, before they become more deep-rooted into the psyche of the student and carried into the workplace after graduation.

Many other studies are congruent with this study showing greater readiness for shared learning within nursing as opposed to medicine (Horsburgh *et al.* 2001; Tunstall-Pedoe *et al.* 2003; Morrison *et al.* 2004; Horsburgh *et al.* 2006; Curran *et al.* 2008; Curran *et al.* 2010; Wilhelmsson *et al.* 2011; Baker *et al.* 2011; Hood *et al.* 2014; Keshtkaran *et al.* 2014; Judge *et al.* 2015; Wong *et al.* 2016; Jaideep *et al.* 2016; Talwalker *et al.* 2016). In support of previous studies (Horsburgh *et al.* 2006; Coster et al 2008) there is recent evidence reporting nurses to be the most amenable group to change following IPE (Hawkes *et al.* 2013; Judge *et al.* 2015). With the inclusion of similar professional groups to this study, Judge *et al.* (2015) also found highest scores on readiness among dietetic students and lowest among medical students. Judge *et al.* (2015) found significant differences in readiness for shared learning for nursing students that were not observed in any other groups involving medicine, physiotherapy, dietetics or pharmacy.

Perhaps nurses regard themselves as equal members of the IPW team, and are therefore more ready for IPE. This positivity could also reflect a different approach to their undergraduate programme whereby IPW working is perhaps valued greater. If that is the case, other healthcare courses that don't seem to reflect as positive a view to IPE or IPW among their students, could have much to learn from the nursing course philosophy. On a less optimistic note, this greater positivity among nursing/dietetic students, combined with less positivity among medical students, could be a consequence of stereotypical attitudes about status differences perceived to exist among the professions as previously discussed. As was seen in the study by Baker *et al.* (2011), perhaps the 'non-medical' students felt they had much to gain by learning alongside a perceived higher status profession, and the medical group felt they had more to lose learning alongside a perceived lower status profession.

Consistent with Pollard *et al.* (2006), these study findings imply that 'healthcare profession' presents as a significant variable when it comes to explaining differences in attitudes about IPE and IPW among undergraduate healthcare students. The tendency for some professions to show lower readiness for shared learning than others is a matter of concern, particularly as it is a phenomenon that has been shown to persist throughout the healthcare program, and could have a basis in stereotyped views of society which can be very difficult to change.

The influence of gender on readiness to learn interprofessionally

An overwhelming majority of studies found that males were less enthusiastic for IPE than females (Pollard *et al.* 2005, 2006; Coster *et al.* 2008; Curran *et al.* 2008; Rose *et al.* 2009; Wilhelmsson *et al.* 2011; Talwalkar *et al.* 2014; 2016; Wong *et al.* 2016) leading to the decision to investigate gender differences in this study. Uniquely King *et*

al. (2012) reported no gender differences. However this study was atypical to others as it entailed a large and most diverse sample of healthcare students (n=1526) from varying years, institutions, some with previous IPE experience, and many programmes involved ranging from unlicensed courses to diploma, degree, and masters programmes.

Given the amount of evidence reporting gender differences on positivity for IPE, it was not surprising to find gender differences in readiness for interprofessional learning in this study with females more ready for IPE than their male counterparts (section 6.3.3.4). This highly significant gender difference which occurred at both timepoints ($P<0.001$) has since been corroborated with recent research (Wong *et al.* 2016). On analysis of healthcare group differences, the medical and pharmacy students were the groups with the lowest scores, best viewed on the means plots showing differences in scores for each professional group by gender at T1 and T2 (figure 6.5).

The gender differences in the study by Wilhelmsson *et al.* (2011) did not change with educational progress throughout the academic program of study. This study however revealed that the traditionally male-dominated pharmacy profession had higher readiness for shared learning than medicine at both timepoints. However unlike medicine, the vast majority of pharmacy students in this study were female (52 females out of a total sample of 66).

At the start of second year a male medical student commented:

> *'I think learning with other students in college might hold all of us back. We need to learn with our own groups to do our own job'*
>
> (Section 6.2.3).

On the basis of these study findings, gender clearly can have an influence on readiness for shared learning. Furthermore, the regression model showed predictability of gender for readiness to learn interprofessionally. Perhaps this could be interpreted to result from variations in learning styles between the males and females, whereby females had a more of a tendency to emphasise listening and understanding the views of others during the learning process as identified by Coster *et al.* (2008).

Relationships between variables and readiness for interprofessional learning

Relatively few studies were found to demonstrate significant correlational relationships between the variables that were explored in this study. The most similar to this study include Hind *et al.* (2003), Coster *et al.* (2008), Wong *et al.* (2016) and Stull and Blue (2016). In this study, strength of professional identity, female gender and rating on importance of IPW significantly positively correlated with and showed predictive ability for readiness to learn interprofessionally ($P<.001$). As with this study, Hind *et al.* (2003) and Stull and Blue (2016) reported a positive correlation between strength of professional identity and readiness for interprofessional learning. Hind *et al.* (2003) argued that the positive relationship found between professional identity and readiness for interprofessional learning could suggest that these students may be more open to engaging in shared learning as a result of the greater role security that a strong professional identity produces (Hind *et al.* 2003). On that basis, the high strength of professional identity in conjunction with high ratings for importance of IPW sustained at both timepoints in this study could similarly mean that professions, who are secure in their professional identities and have a strong appreciation for the importance of IPW, may be more willing to work and collaborate together on interprofessional teams. Perhaps the most challenging issue for effective IPE and IPW on the basis of these

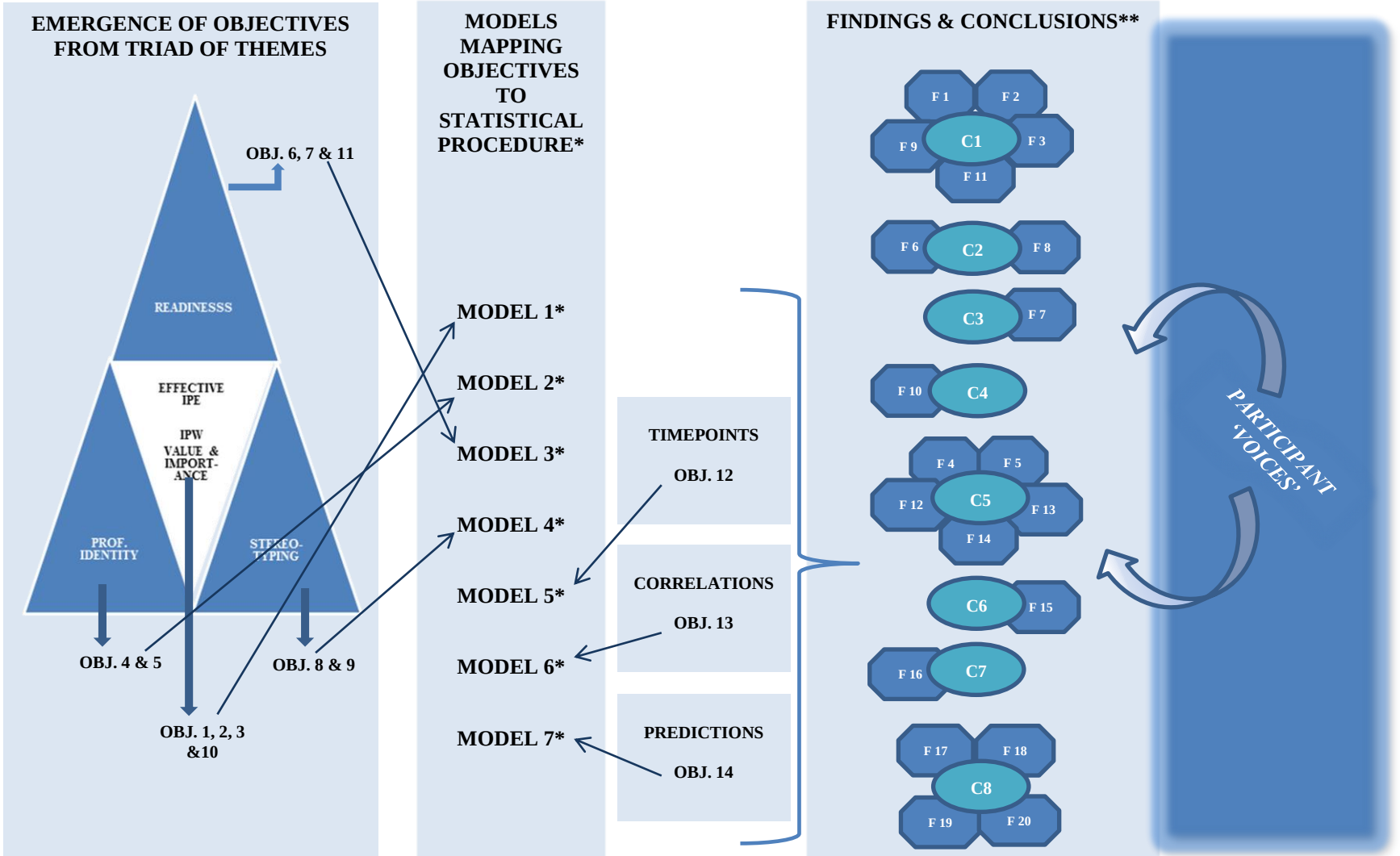
correlations and predictive models is the gender factor, whereby it seems that to be female means greater willingness to engage with IPE and value IPW.

This study also found that as heterostereotypes ratings by healthcare groups' increases, so too does readiness to learn interprofessionally, with a significant positive moderate correlation observed in dietetics, occupational therapy and physiotherapy and a significant positive weak correlation observed in medicine, nursing and pharmacy. This finding suggests that students who think more highly of their healthcare colleagues from other groups and the individuals that they will be on teams with after graduation, are more likely to want to share their learning with them, accentuating the importance of maintaining and fostering positive views of other healthcare professions among disciplines before ever engaging students in shared learning activities. There was also a significant correlation between autostereotypes and readiness for the nurse, OT, and pharmacist but not for the other groups, possibly indicating that as students ratings increased on rating of own profession so does the confidence to learn beside other healthcare professionals such as medicine, who are sometimes perceived as more academically superior. In the context of these correlations it is interesting to note that Stull and Blue (2016) found that an early IPE intervention did not strengthen professional identity, positively affect student attitudes towards other professions or increase readiness for interprofessional learning. Stull and Blue (2016) note however, that these particular IPE sessions were scheduled on Friday afternoons which students complained about, thus again emphasising the necessity to exercise caution when designing IPE interventions.

7.10 *The Inward Journey*

At this stage of the research process I am pleased to say I feel I have arrived at a significant place. Rather than persist with the linear constraints of writing, I have encapsulated this point of arrival in figure 7.3 which maps the progression of my study from the emergence of the themes from the literature, development of study objectives, choice of statistical procedures to the findings and conclusions.

Figure 7.3 Progression of study from literature review themes, objectives (OBJ) and statistical procedures, to findings (F) and conclusions (C)



*Models 1 to 7 can be viewed in chapter 5, figures 5.1 to 5.7 **Key to codes can be viewed in appendix 8

7.11 Study limitations

There were a number of limitations associated with this study which need to be taken into consideration when interpreting the findings.

As is frequently the case with longitudinal survey research, attrition represents a main limitation of this study due mainly to non-participation and to a lesser extent, non-adherence to the identifier code on the questionnaires. 185 students were lost at the second timepoint out of an original 572 (table 1). With the greatest loss in just over 50% of the nursing sample, the researcher had to consider the possibility of influence due to being a member of staff in the same school, albeit the researcher had no involvement with this cohort in terms of teaching or assessment. However, the nursing students may have perceived this differently, or as a potential threat to their academic progress. The extent to which these findings represent non-responders at the second timepoint is also not clear. There is a potential bias in that the students who did respond at the second timepoint could be those that place more value or indeed less value on the prospect of sharing learning with other professions.

Positivity for IPW/IPE and high professional identity scores among neophyte students, particularly at the first timepoint, could be affected by the natural enthusiasm and motivation which could be expected when students commence a course of choice. Social desirability response bias could have also yielded higher scale ratings, particularly at the first timepoint, reflecting a desire by students to appear motivated and enthusiastic to their lecturers/course co-ordinators when they start their course. Students in this sample answered the questionnaire 'blind' to the educational approaches, curriculum design or the potential barriers/challenges associated with IPE, and this limited knowledge and insight could result in somewhat unrealistic attitudes.

The comparator group consisted of a cohort of social studies students. However during the course of this study the language changed somewhat from 'healthcare professional' to 'health and social care professional' and the findings need to be viewed in that light. This caused the researcher to question if the groups could be considered disparate since there appears to be a perception of greater homogeneity between these professionals. Whilst the study findings as they relate to the significant difference found between healthcare and comparator group regarding value placed on IPW over the first year need to be considered in the light of this limitation, the comparator group did however share different experiences to the healthcare groups and belonged to a completely different Faculty which imparts a degree of confidence in this finding. A major disadvantage of comparative design lies in that differences observed between groups may not necessarily be due to the distinguishing features between the groups (Bryman 2016). Therefore group differences generally need to be considered in the light of this potential limitation.

Whilst it would have been advantageous to include an IPE intervention, to do so was not within the scope of this research study. Hence, this study aimed to inform the development and implementation of future IPE interventions in this institution. This study could potentially help to inform IPE interventions or future research endeavours in other Irish HEI's. However, given that this study was confined to one HEI, the generalizability of these findings is limited. Since the greatest proportion of the healthcare students were Irish (n=457, 85.6%), and all members of the comparator group were Irish (n=38), these findings cannot be generalized to other cultures who may hold different attitudes and beliefs to those mainly represented in this study.

Furthermore, differences in strength of professional identity may exist based on ethnicity of the student.

Quantitative survey data was supported by qualitative comments offered by the student participants, but should not be taken as representative of the views of the groups at large due to the small number of responses. Greater insights could have been gleaned if participants were followed up with focus group interviews. However it was beyond the scope of the study due to time constraints to follow up on students after the second data collection timepoint. One reason for including the qualitative component was to ascertain if students felt they experienced any IPE during the first year through clinical and/or academic experiences and/or informal IPE. The student nurses experienced practice placements, and the medical and physiotherapy students took part in a joint community case study. It was hoped that some insights about that experience could be gleaned from these students at the second timepoint. However, it was beyond the scope of this study to definitively ascertain if any moderations of viewpoint directly result from aforementioned experiences and the study results need to be viewed in that light.

The survey instruments used in this study represented well validated, reliable scales that, with the exception of the Interprofessional Working Scale (IPWS) (While and Barribal 1999), were used in a multitude of previous studies. The Readiness for Interprofessional Learning Scale (RIPLS) (Parsell and Bligh 1999) was one of the first and most widely used instruments to measure students' attitudes to IPE. The revised version of the RIPLS, with improved internal consistency (McFadyen *et al.* 2005 and 2006), was used in this study as it was the considered to be one of the most reliable scales to measure IPE attitudes at that time. However, with new instruments that have since been developed which claim better construct validity and reliability (Mahler *et al.*

2015), it may no longer be considered the most suitable scale to study attitudes towards IPE and the study findings need to be viewed in that light. It needs to be noted too that correlational research is limited insofar as unlike experimental studies, results imply association and not causation. It is therefore difficult to draw firm conclusions from this study as to the impact of stereotypes, gender, professional identity and value attributed to IPW using this method (Parahoo 2014).

There were unequal sample sizes in this study which increase the negative effect of violation of assumptions on the validity of a test (Field 2013). Equal-sized groups maximize statistical power and having both unequal sample sizes and variances affects statistical power and Type I error rates (Rusticus and Lovato 2014). However, attempt was made to counteract this problem by using analytical procedures that are designed to deal specifically with unequal group sizes, namely, Games Howell Pairwise Comparison test, Welch's test for unequal variances, Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons (Pallant 2010; Field 2013; Rusticus and Lovato 2014; Laerd 2015).

7.12 Dissemination strategy

The dissemination of these study findings will take place locally, nationally and internationally. In the first instance, the findings will be issued locally to all stakeholders from the participating schools in this institution and the final report will be made available on the Faculty of Health Science website. As representative from the school for the Faculty of Heath Sciences Interprofessional Learning committee, I can directly discuss these findings with the IPL group so they can be used to inform our future development of IPE workshops as well as inform future research studies. Given

the relevance of the study findings for clinical practice, these will also be made available to our clinical partners at the hospital-based education centres and student-based practice placements. As educator teaching on education modules within the curricula, I am conveniently placed to incorporate the principles of IPE and present the study findings for discussion and debate to student nurses. This will raise awareness about the importance of IPE for effective collaboration during the undergraduate years. As a designer of the interprofessional module in our fourth year new curriculum, I am also suitably placed to use these study findings to inform the development of the learning outcomes.

These study findings will be presented at relevant National and International conferences that have interprofessional education and interprofessional healthcare workforce development as their primary focus, as well as at allied health and other higher education conferences. There are also other opportunities to disseminate these findings at conferences that do not have IPE as the focus. These fall within the realms of health and safety, avoidance of medication error, and many others that focus on an interprofessional policy approach, a strategic vision for a collaborative workforce, and the transformation of global healthcare systems to meet the needs of healthcare populations. I am privileged to be a member of the U.K. Centre for Advancement of Interprofessional Education (CAIPE) which will facilitate the dissemination of these findings through CAIPE meetings, conferences and seminars. There are many upcoming opportunities for global presentation of my work. The biennial global 'All Together Better Health' conference is held at various locations around the world with the next taking place in 2020 in Qatar, bringing the event to the Middle East for the first time. In September 2019, the World Association of Interprofessional Practice and

Education (WAIPE) conference is taking place in Antwerp. The first international dissemination of these findings is scheduled to take place in March 2019 where I will present at our Trinity Health and Education Research Conference.

The study results will be disseminated through peer reviewed publications in relevant education and healthcare journals. The primary journals will include Journal of Interprofessional care, International Journal Nursing Studies, Journal of Research in Interprofessional Practice and Education, and the International Journal of Practice-based Learning in Health and Social Care.

7.13 Conclusion

This study investigated the attitudes of a cohort of undergraduate healthcare students in an Irish university towards interprofessional education and working at course commencement, and at the beginning of their second year, in order to inform the development and implementation of interprofessional education interventions. Effective interprofessional working is vital for safer, quality patient/client care and primary healthcare delivery within the healthcare service. This can potentially be achieved through interprofessional education in the undergraduate years to enable the skills and abilities for healthcare undergraduates to work interprofessionally when they enter the workforce. The importance/value attributed to interprofessional working, strength of professional identity, attitudes students' hold towards own and other professions, and readiness for interprofessional education, are underlying factors associated with successful outcomes for interprofessional education and effective interprofessional working. This study has investigated these from an Irish perspective making a unique contribution to the global body of evidence.

The final chapter concludes this study with the recommendations and implications for education, health and education policy and future research.

Chapter 8 Conclusion and Recommendations

8.1 Introduction

This study concludes with implications and recommendations for relevant stakeholders involved in clinical and academic healthcare education, policy making, and for future research. Each section is accompanied with reference to the findings that informed the recommendations. The Contact Hypothesis (Allport 1954) and Social Identity theory emerged as useful theories through which to view the implementation of successful interprofessional education for future interprofessional working in healthcare in this institution, and potentially around the country, and these are referred to as relevant throughout this chapter.

8.2 Implications for Higher Education Institutions and affiliated clinical education sites

The findings from this study spotlight the potentially strenuous '*uphill battle'* (Michalec *et al.* 2013: 207) facing policy makers, educators, and IPE champions alike for the successful implementation of IPE within our Irish institutions. The key messages gleaned from the differences and inequalities found among stereotyped perspectives about the healthcare professions in this study, have implications for the design, structure, timing, and theoretical underpinnings of IPE.

Students' positivity towards IPE and IPW was high on course commencement in this study and was sustained into the second year, as evidenced by the ratings on the Readiness for Interprofessional Learning Scale (Parsell and Bligh 1999) and the Interprofessional Working Scale (While and Barribal 1999). Furthermore, strength of professional identity was also high and sustained into the second year as seen by the scores on the Professional Identity Scale (Browne *et al.* 1986). As the high readiness for shared learning in this study was sustained without formal IPE, it is quite likely that any positive influence resulted from experiences in the practice area. On that basis the clinical area as well as the academic institution could be an effective place to begin IPE.

On basis of these findings, a principle recommendation from this study is for the early implementation of IPE in undergraduate healthcare courses in both the clinical and academic environment. Positive attitudes to IPW and strong professional identity have predictive value for readiness to learn interprofessionally, making it all the more important to capitalise on existing optimism and enthusiasm that emerged among these students. Furthermore, some comments from students indicated that intuitively they felt IPE made good sense. Of those that commented at T2, the majority believed IPE should be commenced early and continued throughout the programme of study. IPE in the first year of study addresses the complexity that comes with trying to effectively implement it in later years for the first time in courses with varying duration, and among students who may be at that stage less receptive to it.

Amongst these findings emerged a critical necessity to address destructive inequalities and stereotypes. Negative stereotyping was evident among the groups, which was also sustained into the second year, albeit with some improved attitudes, thus showing resistance and persistence to change. It would be important to prevent or modify

negative stereotypes before they can obstruct the student's existing ability to see the logical necessity for IPE and possibly become less optimistic. On that basis it could be valuable to interrogate these stereotypes early before they become more deep-rooted into the psyche of the student and potentially carried into the workplace after graduation. Whilst a primary goal of IPE is to moderate negative stereotypes, the fact they exist in the first place potentially creates a paradoxical difficulty for successful IPE outcomes if students are either not willing to share their learning because of them, or are unwilling to adopt an alternative view more conducive to collaboration.

The implementation of early IPE has implications for curriculum development in Higher Education Institutions, and affiliated clinical education sites.

8.2.1 Curriculum development

As with any educational endeavour, IPE initiatives need to be underpinned by educational theory. However, in the unique situation of IPE, the added complexity involving contact between students from different professional groups, means negative attitudes and perceptions of inequality can prevail thus undermining the 'educational' and the 'interprofessional'. Research has indicated that students' attitudes can improve when the Contact Hypothesis is used to engender positive learning environments during interprofessionally learning (Carpenter and Hewstone 1996). The Contact Hypothesis in effect asserts that negative attitudes of different group members can be improved through positive contact (Allport 1954). Hence, the Contact Hypothesis would be a useful theory to foster equality between participants and to guide the establishment of non-threatening learning environments.

Perceptions of inequality by students participating in IPE are very likely to be problematic in the face of differences found between groups on perceived importance of the presence of healthcare professionals on the IPW team; differences between groups for readiness for IPE; gender differences; and negative stereotyping. Understanding both differences and similarities are important for effective interactions (Allport 1954). Given their destructive potential, negative attitudes, stereotypes and prejudices need to be interrogated in the context of the underlying historical influences and societal driving forces that gave them origin. In the first instance a homogeneous group setting may be a 'safer' place to express feelings without feeling encumbered by other groups with whom they may experience confidence issues. This could encourage students to interrogate and lay bare their beliefs in the hope that ensuing IPE does not reinforce un-interrogated negative attitudes. This could take place very early after course commencement and be incorporated into a suitable module. The scales used in this study could serve as useful instruments to glean perspectives, and help illuminate the existence and origin of stereotypes. Students having become more aware of these issues may better understand them and become more amenable to positive change.

There remains some debate as to whether voluntary IPE is more or less beneficial than involuntary IPE. Whilst voluntary IPE may be useful to generate positive IPE outcomes among already enthusiastic students, students who self-exclude from IPE could be more likely to retain negative attitudes. It seems logical that if IPE is to successfully achieve its broad aim of improved collaborative working on a grand scale, all undergraduate students need to participate to ultimately scale-up the collaborative workforce needed for our modern day healthcare systems.

Qualified healthcare professionals at clinical placement sites are essential role models to undergraduate students for the provision of safe, quality patients/client care executed through IPW. They are uniquely positioned as workplace mentors to ensure students obtain constructive and influential experiences which portray the positive impact of collaboration on patient/client care. It is important that a sense of the value of IPW is instilled at an early stage in training, and for IPE to be appreciated as a way of preparing students for future IPW when they enter the workforce. Clinical and classroom based IPE are not exclusive but complementary. Interprofessional training wards (IPTW) represent a potentially effective method to achieve these outcomes whereby learning to be 'interprofessional' could be accomplished in the context of a realistic setting. Reporting success in other countries, an IPTW has been established this year in a hospital affiliated to this institution for third year students. This could be expanded in this institution and nationally to include first year undergraduates.

Some students in this study indicated a lack of confidence to learn with other professionals and intimated the need for support. In line with the Contact Hypothesis, positive expectations and an atmosphere of cooperation are important for successful interactions (Allport 1954), so it is essential educational facilitators involved in IPE delivery effectively prepare and support students before, during and after their IPE experiences, so that positive expectations do not materialise into negative experiences and deteriorating attitudes.

Qualified practitioners from all the healthcare professions in both clinical and academic settings need to be genuinely enthusiastic and willing to engage with students during IPE, whilst collectively reinforcing the true values and goals of collaborative learning and working. However, it must be recognised that the magnitude of change that the

implementation of IPE brings into HEI curricula can threaten the boundaries and status of all individual stakeholders. To that effect it is equally critical that IPE educators/facilitators both clinical and academic receive the preparation, training and support to effectively function in this role.

Long term viability of IPE is contingent upon institutional support which is essential not only for the successful implementation of IPE, but also for its sustainability. Institutional support features too as a condition for effective interactions in line with the Contact Hypothesis (Allport 1954), and is critical in order to address the immense logistical concerns for IPE, nurture a culture that approves IPE, and to support Faculty progress. IPE can be hampered by many logistical issues such as space, timetabling and various course- specific learning activities. These are challenging to overcome but as has been seen in this institution with regards to development of IPE for students in their third year, these are by no means insurmountable barriers when there is determination, commitment and cooperation with Faculty and participating clinical sites.

In accordance with the Contact Hypothesis (Allport 1954), it appeared that some groups in this study shared more informal social contact with each other which may have brought about greater mutual appreciation, thus lending support to the argument that contact through informal IPE experiences can be of benefit. Hence, it is recommended that informal social spaces are facilitated in the HEI's as best as possible. The Student Life Committee is this university has recently commenced an initiative to develop a network of student spaces throughout the university termed 'Zón Mac Léinn'. This entails the production of informal spaces open to all students to relax, socialise and collaborate and funding has been made available to advance the agenda. However, since the healthcare students are separated into different locations on and off campus,

the production of common spaces proves particularly challenging and strategies to facilitate informal contact may require more imaginative approaches that transcend 'bricks and mortar' barriers. Modern network solutions involving social media could be of benefit, but these could amount to a superficial and poor substitute for real world interactions.

8.3 Implications for health and education policy

Quality patient/client care be seriously compromised by poor IPW and communication among healthcare professions (WHO 2010; WHO 2013a; HSE 2017a). The Republic of Ireland has answered the global call for interprofessionalism but more has to be done. The requirement for better staff communication and IPW in Ireland was recently spotlighted among some disturbing findings from the Irish National Patient Experience Survey (HSE 2017a), and the economic survey of Ireland (OECD 2018) (section 2.2.2).

Maintaining a system of uni-professional education in Irish HEI's will do little to address these issues. Interprofessional teamwork and the education to realise its success, is no longer an optional extra, but critical for safe care. The findings from this study which revealed sustained negative stereotyping and perceived inequalities between professions signal the potential difficulties that healthcare graduates could encounter for collaborative working after graduation. However, a major anomaly exists. Currently in the Republic of Ireland, IPE differs considerably from institution to institution as regards design, length, duration and timing of IPE initiatives. More often than not these initiatives, whilst most likely to be of benefit in their own right, are instigated on an individual basis in terms of HEI, rather than a collaborative endeavour.

This means that the experience of IPE for students varies depending on which HEI is attended and which course is chosen.

On that basis a national strategy is recommended with national guidelines to be established to guide IPE design and practice, work towards a common approach for the attainment of knowledge and skills required for IPW by healthcare professionals, and to ensure consistency across institutions in the Republic of Ireland. It is of paramount important that we establish strong connections and collaborative associations with the international IPE community to realise the reforms necessary to match healthcare professionals' educational requirements, with the realities of modern healthcare service needs. A genuine commitment to IPE by the Irish Health Service Executive and the Department of Health in Ireland is essential to progress the interprofessional agenda. In the absence of adequate support at the policy making level, there is risk that the interprofessional initiative in Ireland will become the mere remit of a few enthusiastic individuals.

8.4 Implications for future research

Whilst the central concern of this thesis primarily focused on the potential influence of attitudes on the development and delivery of IPE, signifying a very real concern for its effective development and success, it represents a very small slice of what needs to be done in terms of investigating this topic further. Research needs to entail studies that investigates the impact of undergraduate IPE on IPW, and ultimately on the quality of healthcare in the Republic of Ireland. The need for more comprehensive understandings for the potential of IPE to improve IPW and ultimately patient/client healthcare

outcomes, are well reflected in the global literature. With this in mind the following recommendations for future research are as follows:

There is marked dearth in global evidence to show the actual impact of IPE on IPW or patient/client healthcare outcomes. Robust studies in the form of the gold standard Randomised Controlled Trial are necessary to address this gap, and add to the body of global evidence that is beginning to emerge from an Irish perspective.

When considered collectively, the findings from previous studies raise questions about the potential value and usefulness of some IPE interventions, which appeared to have provoked negative attitudes to IPE instead of addressing them. If IPE generates negativity, it is in fact producing the opposite effect to its goal. With the wide variation in types of IPE strategies, is difficult to ascertain whether this is due to the actual IPE intervention, or some other factor. Hence, it is imperative that IPE strategies are investigated and evaluated to see what is required to yield the best IPE outcomes. Furthermore, studies are needed to develop a better understanding of the teaching and learning processes involved in the delivery of successful IPE. IPE models that show potential for positively changing views need be properly evaluated to be sure they moderate negative perceptions towards the positive as a result of the 'interprofessional', as well as the 'educational' component.

The effective timing of IPE needs to be continually investigated to discover when best outcomes can be achieved, and whether factors such as professional identity play a part. IPE is argued to be suitable for students who have a relatively strong identity with their own professions are well placed to engage in

shared learning but this debate remains unresolved in the literature. Exploration of professional identity development among students as they progress through their healthcare programs with subsequent follow up after graduation may provide further insight as to when best to introduce IPE. Cultural influences in terms of ethnicity should also be accounted for so students with different values or beliefs are not lost among the wider group of Irish students.

The investigation of differences between the healthcare professions needs to be continued to shed greater light on how to identify strategies to address negative perceptions among professional groups, who may not hold the same value on IPE or IPW. However, in order to fully comprehend what seems to be a global trend on healthcare profession differences, further exploration is warranted to unveil the true nature and origin of these differences. Mixed methods studies could be valuable to follow up attitudes over time, and corroborate attitudinal scale data. On-going research needs to identify the origin, nature, existence and persistence of negative attitudes and stereotypes so IPE programmes and interventions can be suitably tailored and designed to mitigate encumbering beliefs.

The research instrument for this study uniquely comprised four measures which to date have not been used together in either the European or global literature. The Readiness for Interprofessional Learning Scale (RIPLS) was originally developed and tested to assess readiness for IPE before an IPE intervention, but has been widely adopted for use in before and after IPE intervention studies for which it was not originally intended (Mahler *et al.* 2015). There is a need to develop new robust tools of measurement that will enable effective longitudinal

evaluation of IPE interventions to obtain valuable information for IPE curriculum modification and enhancement.

As the evidence for IPE continues to evolve greater knowledge will be attained as to how it can most effectively be planned and implemented to positively affect the delivery of patient/client care and healthcare outcomes. Our prospective longitudinal study that commenced in November 2016 is currently underway in this institution and aims to examine students' attitudes before and after their IPE experience. It should provide further insights as to how we can best educate our Irish healthcare students to learn with, from and about each other in both the academic and clinical environment.

8.5 Closing comments: Looking back and ahead

This chapter marks the end of my PhD journey but celebrates the beginning of a voyage. The purpose of this study evolved in response to the global recognition that effective interprofessional working is vital for safer, quality patient/client care and primary healthcare delivery within the Irish healthcare service, and to a call for the development and implementation of effective interprofessional education within healthcare courses in Higher Education Institutions in this country and around the world. Positive attitudes towards and outcomes from interprofessional education, have been associated with positive outcomes for interprofessional working, which translates to a potentially promising outlook for the future of Irish healthcare if interprofessional education is effectively implemented in the Higher Education Institutions in the Republic of Ireland.

This study has made a unique contribution to the body of global evidence involving an Irish population of undergraduate healthcare students. The paradoxical situation whereby our healthcare professionals are expected to work collaboratively after graduation, yet are still educated separately during their academic courses, needs to be effectively addressed. Uni-professional approaches to healthcare education are no longer a satisfactory solution to enable the skills and abilities for healthcare undergraduates to work interprofessionally when they enter the workforce. Collectively, the data from this study provides convincing evidence for the commencement of formal IPE during the first year for the students in this institution. This is on the basis of the overall positive and sustained positive findings on value placed on interprofessional working and readiness for shared learning, which emerged

in conjunction with strong professional identity and a milieu of stereotyped views about healthcare professions; views which would be best interrogated from the outset.

To liberalise learning towards an interprofessional approach there needs to be stakeholder commitment to improve healthcare through collaboration, attain mutual support between professions and establish interprofessional education within Higher Education Institutions. Crucially for the interprofessional movement to actually thrive and be sustainable, healthcare professionals must have 'readiness' to set aside academic rivalry, professional boundaries and protectionism.

Interprofessional education holds a key to improving interprofessional working and, effectively accomplished, could in time positively impact on the safety and quality of patient/client care within our Irish healthcare service.

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Appendices

Appendix 1. Faculty of Health Science: ethical approval

THE UNIVERSITY OF DUBLIN
TRINITY COLLEGE

SCHOOL OF MEDICINE
FACULTY OF HEALTH SCIENCES

Trinity College, Dublin 2, Ireland
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Professor Dermot Kelleher, MD, FRCPI, FRCP, F Med Sci
Head of School of Medicine
Vice Provost for Medical Affairs

Ms Fedelma McNamara
School Administrator
email: medschadmin@tcd.ie

Ms Margaret McAdam,
Stonebridge House,
Mullacash,
Naas,
Co Kildare

Thursday, 9th September, 2010

Study: A study of undergraduate healthcare students views regarding interprofessional working and education

Dear Applicant (s),

Further to a meeting of the Faculty of Health Sciences Ethics Committee held in May 2010, we are pleased to inform you that the above project has been approved without further audit.

Yours sincerely

Prof. Orla Sheils
Chairperson
Faculty of Health Sciences Ethics Committee

Cc
Dr Catherine McCabe
School of Nursing & Midwifery, 24 D'Olier Street, Trinity College, Dublin 2

Re Issued 22.05.18

Appendix 2. Letter for access

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

Stonebridge House,
Mullacash,
Naas,
Co. Kildare.

12th September 2010

To: [*Relevant staff member*].

From: Margaret Mc Adam.

Re: Request for:-

1. Access to Senior Freshman student cohort for first data collection 2011.

2. Access to Junior Freshman student cohort for second data collection 2012.

Dear Colleague,

I am seeking permission to access the cohort of first year [*relevant profession inserted*] students to commence data collection in October 2011, and the following year October 2012. My research aims to investigate the attitudes of undergraduate healthcare students in an Irish university towards interprofessional education and working, in order to inform the development and implementation of interprofessional education interventions. Ethical approval for the study was granted by Faculty of Health Sciences on the 9th September 2010. I enclose a copy of the research proposal for your attention.

I look forward to hearing from you at your earliest convenience.

Yours Sincerely,

_____
Margaret Mc Adam

PhD student and lecturer,
University of Dublin, Trinity College
Dublin 2

Email:- mcadamma@tcd.ie

Appendix 3. Participant information

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

A Study of Interprofessional Education and Interprofessional Working in Healthcare

You are being invited to take part in a research study carried out at the Faculty of Health Sciences, Trinity College Dublin.

This is a study of interprofessional education and interprofessional working. Interprofessional education (IPE) is defined as occasions when two or more professions learn with, from and about each other, to improve collaboration and quality of care (The UK Centre for Advancement of Interprofessional Education (CAIPE 1997). Interprofessional working (IPW) relates to healthcare professionals working together on the multidisciplinary team (MDT) and is also termed multidisciplinary working.

The purpose of this study is to:

Investigate the attitudes of undergraduate healthcare students in an Irish university towards interprofessional education and working at course commencement and at the beginning of the second year, in order to inform the development and implementation of interprofessional education interventions.

How is this study designed?

This study is a longitudinal survey over one academic year with data collection at course commencement and return to study in year two. It also involves a non-healthcare comparator group of Social Studies students.

Who will be invited to participate in the study?

All undergraduate students on six healthcare courses including: dietetics, medicine, nursing, occupational therapy, pharmacy, and physiotherapy. Students are all part of

the Health Science Faculty at Trinity College. A group for comparison purposes will consist of Social Studies students that commence the same year as you.

What do I need to do?

You will need to first of all read this leaflet carefully and take some time over the next few days to see if you feel you would like to participate in the study. I will meet you together with your own professional group in the classroom, approximately one to two weeks after you start your course. This will take place during a scheduled lecture so you do not have to come in on your own time. I will explain the study purpose again, answer any questions you may have and invite you to fill in the questionnaires if you wish to participate. I will return at the beginning of your second year and request interested participants to fill in the questionnaire a second time.

Do I need to identify myself to the researcher?

No. The questionnaires are completely anonymous and do not require your name. The only information that I will have relates to the healthcare course that the questionnaire originated from. There is no way I or anybody else will ever know your personal identity. The anonymous data will be stored on a password protected computer file that only I and my supervisor will have access to. This data is stored for a period of 5 years in keeping with recommended best research practice and is afterwards destroyed.

Do I have to take part in this study?

No. Participation is completely voluntary and you have the right to refuse participation, refuse any question, and withdraw at any time without any consequence whatsoever.

Will participation in this study affect my course outcome?

In no way can participation in this study affect your course outcome-that's a guarantee.

Many thanks for considering participation in this study.

Margaret Mc Adam
Lecturer and PhD student
Trinity College Dublin

Appendix 4. Survey instrument

For Office Use

HC Course	
Case	
Collection	
Data entry	

A Study of Interprofessional Education and Interprofessional Working in Healthcare

Questionnaire

This questionnaire is for a research project that evaluates undergraduate healthcare students' views and attitudes to interprofessional education and working. It involves students from medicine, pharmacy, physiotherapy, nursing, occupational therapy, and dietetics.

The questionnaire is anonymous. This means that nobody dealing with the questionnaires will know your name. Because we need to match questionnaires completed between the first and second collection time, we request that you fill in a code which only you will know so we can identify questionnaires filled in by the same person without knowing their name.

IMPORTANT

Before you start answering, please fill in your personal identification code.

First initial of your mothers first name→		*Example*:	*mother: Mary* →	M
Month of your mothers birthday →			*mother born in October* →	10
First initial of your fathers first name→			*father: Paul* →	P
Month of your fathers birthday →			*father born in July* →	07

Section A: Your views of health care teams.

In this section I am interested to find out your views on how important it is for healthcare professionals to work as part of the multidisciplinary team in healthcare. Please tick the box that most represents your view.					
	Very Important	**Important**	**Neither Important or Unimportant**	**Unimportant**	**Very Unimportant**
How important is it that nurses should work as part of the multidisciplinary team	☐	☐	☐	☐	☐
How important is it that doctors should work as part of the multidisciplinary team	☐	☐	☐	☐	☐
How important is it that physiotherapists should work as part of the multidisciplinary team	☐	☐	☐	☐	☐
How important is it that occupational therapists should work as part of the multidisciplinary team	☐	☐	☐	☐	☐
How important is it that pharmacists should work as part of the multidisciplinary team	☐	☐	☐	☐	☐
How important is it that dieticians should work as part of the multidisciplinary team	☐	☐	☐	☐	☐

(While and Barriball, 1999)

Section B: Your views of your discipline group.

In this section I am interested to find out your views relating to being part of the medical group. Please tick the box that best represents your view.					
	never	**seldom**	**sometimes**	**often**	**Very often**
I am a person who considers the medical group important	☐	☐	☐	☐	☐
I am a person who identifies with the medical group	☐	☐	☐	☐	☐
I am a person who feels strong ties with the medical group	☐	☐	☐	☐	☐
I am a person who is glad to belong to the medical group	☐	☐	☐	☐	☐
I am a person who sees myself as belonging to the medical group	☐	☐	☐	☐	☐
I am a person who makes excuses for belonging to the medical group	☐	☐	☐	☐	☐
I am a person who tries to hide belonging to the medical group	☐	☐	☐	☐	☐
I am a person who feels held back by the medical group	☐	☐	☐	☐	☐
I am a person who is annoyed to say I am a member of the medical group	☐	☐	☐	☐	☐
I am a person who criticises the medical group	☐	☐	☐	☐	☐

(Browne al, 1986)

Section C: Your views about interprofessional learning.

In this section I am interested to find out your views about learning with other healthcare students. Please tick the box that best represents your view.					
	Strongly disagree	**disagree**	**neutral**	**Agree**	**Strongly Agree**
Learning with other students will help me become a more effective member of a healthcare team	☐	☐	☐	☐	☐
Patients would ultimately benefit if healthcare students worked together to solve patient problems	☐	☐	☐	☐	☐
Shared learning with other healthcare students will increase my ability to understand clinical problems	☐	☐	☐	☐	☐
Learning with healthcare students before qualification would improve relationships after qualification	☐	☐	☐	☐	☐
Communication skills should be learned with other healthcare students	☐	☐	☐	☐	☐
Shared learning will help me to think positively about other professionals	☐	☐	☐	☐	☐
For small group learning to work, students need to trust and respect each other	☐	☐	☐	☐	☐
Team-working skills are essential for all healthcare students to learn	☐	☐	☐	☐	☐
Shared learning will help me to understand my own limitations	☐	☐	☐	☐	☐
I don't want to waste my time learning with other health-care students	☐	☐	☐	☐	☐
It is not necessary for undergraduate healthcare students to learn together	☐	☐	☐	☐	☐
Clinical problem-solving skills can only be learned with students from my own department	☐	☐	☐	☐	☐
Shared learning with other healthcare students will help me to communicate better with patients and other professionals	☐	☐	☐	☐	☐
I would welcome the opportunity to work on small group projects with other healthcare students	☐	☐	☐	☐	☐
Shared learning will help to clarify the nature of patient problems	☐	☐	☐	☐	☐
Shared learning before qualification will help me become a better team worker	☐	☐	☐	☐	☐
The function of nurses and therapists is mainly to provide support for doctors	☐	☐	☐	☐	☐
I am not sure what my professional role will be	☐	☐	☐	☐	☐
I have to acquire much more knowledge and skills than other healthcare students	☐	☐	☐	☐	☐

(Parsell and Bligh, 1999)

Section D: Your views about members of the health care team.

In this section I am interested to find out how you would rate your own profession and other professionals on each of the characteristics listed in the table below. Please insert the number that best represents your view.

1= Very low 2= low 3= Don't know 4= high 5=Very high

	Academic ability	**Professional competence**	**Interpersonal skills (empathy, sympathy, communication)**	**Leadership abilities**
Dietician	☐	☐	☐	☐
Doctor	☐	☐	☐	☐
Nurse	☐	☐	☐	☐
Occupational therapist	☐	☐	☐	☐
Physiotherapist	☐	☐	☐	☐
Pharmacist	☐	☐	☐	☐

	Ability to work independently	**Ability to be a team player**	**Ability to make decisions**	**Practical skills**	**Confidence**
Dietician	☐	☐	☐	☐	☐
Doctor	☐	☐	☐	☐	☐
Nurse	☐	☐	☐	☐	☐
Occupational therapist	☐	☐	☐	☐	☐
Physiotherapist	☐	☐	☐	☐	☐
Pharmacist	☐	☐	☐	☐	☐

(Hean *et al.* 2006a)

Section E: About yourself

1.Please tick the Healthcare professional group you belong to:

Medicine ☐ Physiotherapy ☐ Nutrition and dietetics ☐

Nursing ☐ Occupational therapy ☐ Pharmacy ☐

2. Are you: Male ☐ Female ☐

3. How old are you?

18-22 years ☐ 23 years and over ☐

4. What is your nationality?

Irish ☐ Other ☐ Please specify _____

5. What is your ethnic or cultural background?

White

Irish ☐

Irish traveller ☐

Any other white background ☐

Black or black Irish

African ☐

Any other black background ☐

Asian or Asian Irish

Chinese ☐

Any other Asian background ☐

Other, including mixed background ☐

Please specify _____

6. Have you worked in a healthcare setting at any time before you started your course?

Yes ☐ No ☐

If yes, what did you do?

_____

_____

_____

_____

7. Do you have a relative who is a health professional? Yes ☐ No ☐

If yes, what profession?

_____

Do you feel this person influenced your views of other healthcare professions?

_____

_____

8. Is the course you are studying your first choice of healthcare course?

Yes ☐ No ☐

If not, what was your first choice?

_____

9. Do you have a previous qualification? Yes ☐ No ☐

If yes, is it:

Certificate ☐ Diploma ☐ Bachelor Degree ☐

Master Degree ☐ PhD ☐ Other ☐

Please specify _____

10. Do you want to tell me anything else about working with other healthcare professionals in healthcare?

_____

_____

_____

_____

_____

Thank you for completing the questionnaire

Appendix 5. Survey Instrument: Additional component to research instrument included at T2

1. Would you be willing to participate in shared learning with other healthcare students?

   _____
   _____
   _____
   _____

2. At what stage in the course do you think shared learning between healthcare students would be best placed? Please give your reasons.

   _____
   _____
   _____

3. Have your views regarding learning with other health professionals changed since you commenced your healthcare course? Please give your reasons.

   _____
   _____
   _____

Thank you for completing the questionnaire

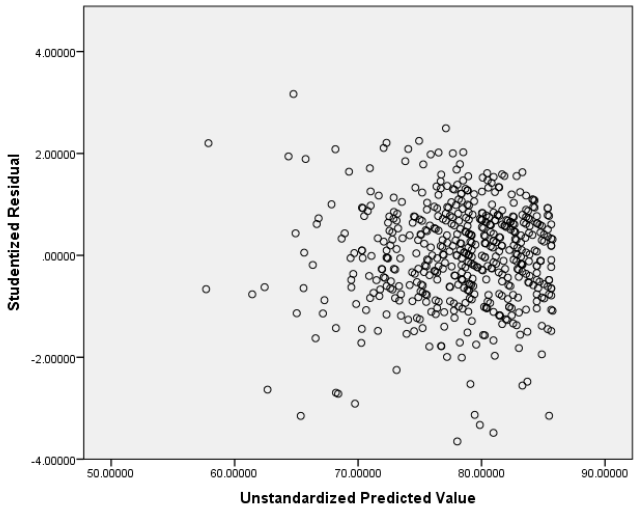
I wish you every success in your chosen career

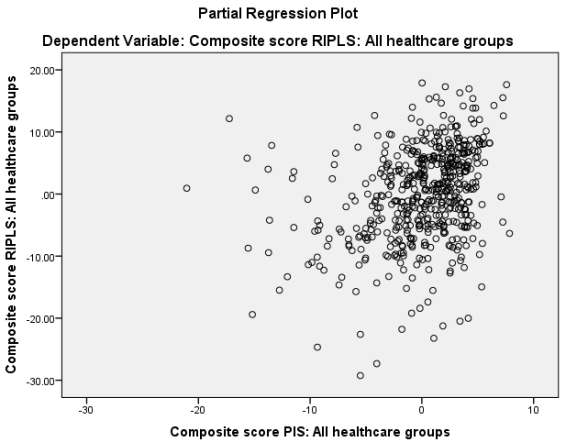
Appendix 6. Conditions for positive attitudes change: The Contact Hypothesis

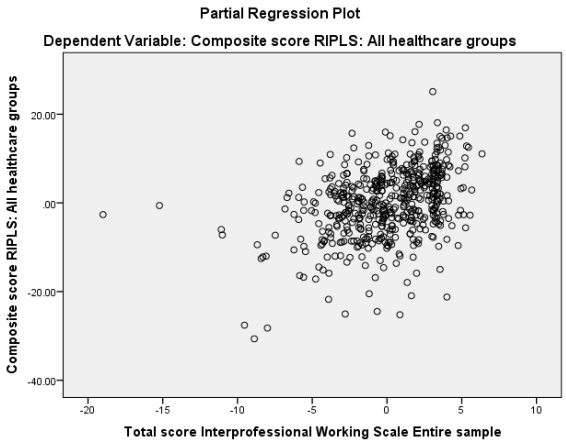
Conditions for positive attitudes change (The Contact Hypothesis)
Participants must have positive expectations
Must be an atmosphere of co-operation
Must be the perception that members of the group are typical and not just exceptions to the stereotypes
Must be institutional support
Successful joint work
Concern and understanding of differences and similarities
Equal status
Positive feedback to students
Hewstone and Brown (1986)

Appendix 7 Hierarchical Multiple Regression: Tests of assumptions

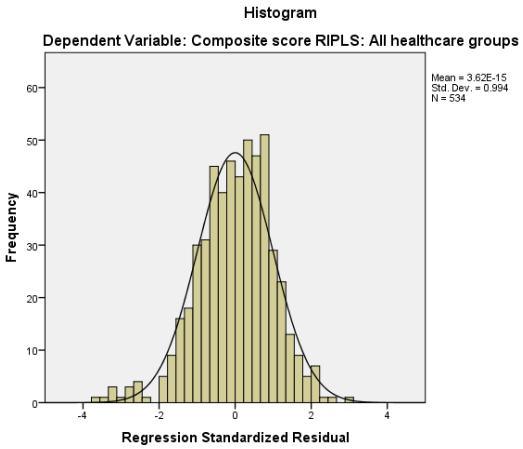
The assumption of linearity for hierarchical multiple regression as assessed by scatterplots

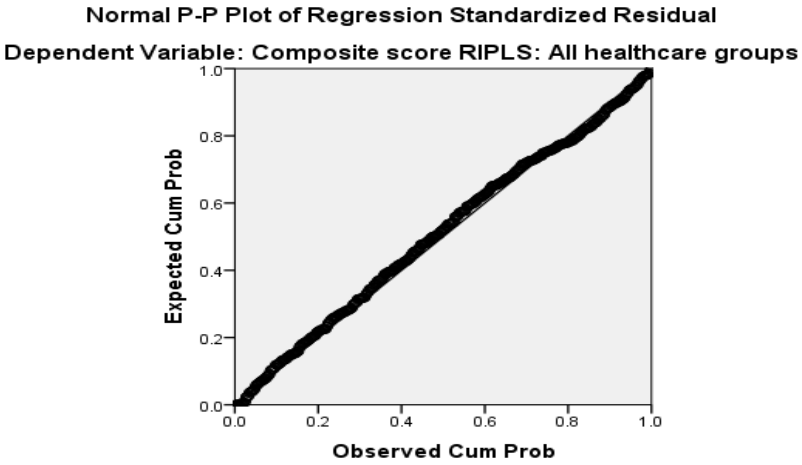


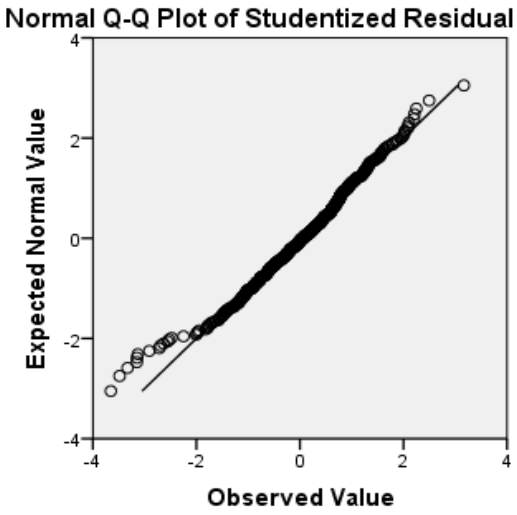




The assumption of homoscedasticity for hierarchical multiple regression as assessed by visual inspection of the plot of studentized residuals versus unstandardized predicted values







Appendix 8. Codes mapped to main findings and conclusions

Codes mapped to main findings

F1 OBJ 1 Value placed on IPW high among entire healthcare group.

F2 OBJ 12 Statistically significantly higher value placed on IPW between timepoints among entire healthcare group, not observed in comparator group.

F3 OBJ 2 Differences emerged between healthcare disciplines on value placed on IPW at both timepoints.

F4 OBJ 3 Differences emerged between comparator group and healthcare group on perceived importance of the presence of healthcare professionals on the IPW team.

F5 OBJ 12 Differences emerged between healthcare disciplines on perceived importance of the presence of healthcare professionals on the IPW team at both timepoints.

F6 OBJ 4 Strength of professional identity was high on course entry for the entire group of healthcare students.

F7 OBJ 5 Differences emerged in strength of identity between the healthcare groups at both timepoints.

F8 OBJ 12 Strong professional identity for entire healthcare group sustained at T2.

F9 OBJ 6 Readiness to learn interprofessionally was high for entire group of healthcare students.

F10 OBJ 12 High readiness to learn interprofessionally was sustained at T2.

F11 OBJ 7 Differences observed in readiness to learn interprofessionally between the groups at both timepoints.

F12 OBJ 8 Healthcare students entered courses with pre-conceived stereotyped views towards their own (autostereotypes) and other professions (heterostereotypes).

F13 OBJ 9 Stereotyped profiles of the professions emerged with similarity between healthcare and comparator groups.

F14 OBJ 12 Heterostereotype and autostereotype ratings moderated between the timepoints for some groups on certain attributes.

F15 OBJ 13 There were positive moderate correlations found between heterostereotypes and readiness to learn interprofessionally for some groups at baseline and there were positive weak correlations found between autostereotypes and readiness to learn interprofessionally for some groups at baseline.

F16 OBJ 14 Gender, strength of professional identity, and value attributed to interprofessional team working, were predictors for readiness for interprofessional learning.

F17 OBJ 10 Females placed higher value on IPW than males.

F18 OBJ 12 Females placed higher value on IPW than males at both timepoints.

F19 OBJ 11 Females revealed higher readiness for interprofessional learning than males.

F20 OBJ 12 Females revealed higher readiness for interprofessional learning than males at both timepoints.

Key to codes: F=Finding OBJ=Objective

Codes mapped to summary of main conclusions

C1 Healthcare students generally place high value on IPW and indicate sustained readiness for IPE after course commencement. The higher value placed on IPW after the first year seen among healthcare students was not reflected in the comparator group. Some healthcare disciplines place higher value on IPW than other disciplines.

C2 Healthcare students have strong professional identity when they commence their course which is sustained over the first year.

C3 There are differences in strength of professional identity with some healthcare groups showing stronger professional identity than others.

C4 There are differences in readiness for IPE with some healthcare groups indicating more enthusiasm for IPE than others.

C5 From the outset, sustained inequalities are apparent among healthcare students regarding their views towards the abilities of the different healthcare professions, and the importance they attribute to the healthcare professions on the IPW team. These inequalities are also apparent among the comparator group thus indicating that they are not solely unique to the healthcare disciplines. Such inequalities appear to have their origin in traditional stereotypes. The stereotypical views have the potential to moderate during the course of the first year.

C6 Healthcare students are more enthusiastic about sharing their learning with other disciplines if they rate the other healthcare groups more positively on professional attributes.

C7 Positive attitudes to IPW, strong professional identity and female gender show predictive value for readiness to learn interprofessionally.

C8 Sustained gender differences are apparent among the healthcare students with females placing higher value on both IPW and readiness for IPE.

Key to codes: C= Conclusion