

**Mechanisms, contexts and outcomes of  
interprofessional education in a student-  
run interprofessional clinic - a realist  
evaluation approach to developing  
programme theory**

**Barbara Maxwell**

**A thesis submitted in fulfilment of the requirements  
of Bournemouth University for the degree of  
Doctor of Philosophy**

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# Abstract

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## Mechanisms, contexts and outcomes of interprofessional education in a student-run interprofessional clinic - a realist evaluation approach to developing programme theory

Barbara Maxwell

**Background:** Interprofessional student-run clinics (SRCs) serve as valuable settings for interprofessional education but there is a lack of understanding of how these clinics work or the processes and outcomes of interprofessional education within them.

**Aims:** This study addresses this knowledge gap through a realist evaluation of a SRC, developing programme theories that identify and explain participant outcomes.

**Method:** Using a qualitative approach and a single-case study design, clinic documentation were analysed and realist semi-structured interviews conducted with 25 key stakeholders (student leaders, volunteers, and faculty clinicians) within one SRC that ran between June 2015 and February 2016. An analytic induction and framework analysis connected threads of key contexts-mechanisms, and outcomes.

**Findings:** Twenty-four programme theories emerged that explained student and patient experiences. Exposure to different forms and durations of interprofessional work framed three main clinic learning experiences with diverse student outcomes. Equal status among students, facilitated by psychological safety and a shared novice identity, had positive effects. Perceived student inequality, fostered by limited interprofessional engagement and role modelling of hierarchy and professional dominance by faculty clinicians, were negative. Patient contact ensured that students valued their experiences and service colocation facilitated better quality, more holistic, integrated care, and positive patient and system-level outcomes.

**Discussion and conclusions:** A realist approach was successful in uncovering how the interprofessional SRC works and the developed programme theories have potential to support the development and evaluation of SRCs. It is recommended that training be provided for faculty and student leaders on fostering equal status, psychological safety, co-development of interprofessional and professional identities, and role modelling behaviours that can enhance collaborative behaviours. Engineering service integration and colocation is key to achieving positive patient and system outcomes.

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# Definitions

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## **Interprofessional education**

“When students from two or more professions learn about, from, and with, each other to enable effective collaboration, and improve health outcomes” (World Health Organization 2010, p.7).

## **Interprofessional collaborative practice**

“When multiple health workers from different professional backgrounds work together with patients, families, carers, and communities to deliver the highest quality of care” (World Health Organisation 2010, p.7).

## **Medical student-run clinic**

“A health care delivery programme in which medical students take primary responsibility for logistics and operation management during clinic hours and which is capable of prescribing disease-specific treatment to patients” (Simpson and Long 2007, p.353).

## **Interprofessional student-run clinic**

“Interprofessional community service-learning initiatives where students plan and deliver clinical and health promotion services, with the assistance of licensed healthcare professionals” (Holmqvist et al. 2012, p.264).

# Chapter 1: Introduction and background

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## Introduction

This chapter is intended to orientate the reader to the thesis topic and structure. It provides an explanation of the origins of the study, including why this topic was selected, and why it was of particular interest to the researcher. It also aims to contextualize the study by providing preliminary background information to place the study within the context of current work in the field of interprofessional education and interprofessional student-run clinics. In so doing it identifies how this study makes an original contribution to the literature. It presents the study aims and outlines the research approach used in addressing these. It also provides an overview of the thesis chapters to assist the reader with navigation of the thesis and to provide a view of both the whole and its parts. While the study presents an international perspective on the literature it is important to note that the author was educated in the UK but currently works in the US. Her current interest in the US setting is reflected in the focus of this study. Having observed the delivery of clinical interprofessional education (IPE) through student-run clinics (SRCs) within the United States (US) and the expansion of this approach to other nations, has fostered a desire to investigate this setting more thoroughly, hence the direction of this thesis.

### 1.1. Background

Interprofessional education has been proposed as an important factor in preparing a future healthcare workforce with the necessary knowledge, skills, attitudes, and behaviours to engage in interprofessional collaborative practice, which is argued to be necessary if we are to meet the increasingly complex needs of patients. For pre-professional healthcare students, IPE is most commonly delivered in a classroom setting or through simulation. In the US professional programmes have struggled to find interprofessional clinical placements for students. While clinical interprofessional programmes have been established in hospitals and outpatient settings (Kent et al. 2017; Jacobsen and Lindqvist 2009), few studies have provided an in-depth examination of the design and development of interprofessional education within clinical settings. Reeves (2005) study described the development and design of an inpatient-training ward in the United Kingdom (UK) modelled on Sanden and Walhstrom's (1996) description of the Linköping training ward in Sweden.

In the US, attention has focussed on the student-run clinic as a possible location for clinical IPE (Beck, 2005; Sick et al. 2014). Medical student-run clinics (SRC) emerged in the US in

the 1960's as an approach to providing free primary care services for the uninsured and medically underserved. They also provided early clinical exposure for medical students. These clinics have proliferated since their inception with over 200 medical SRCs currently operating in the US and they are also being established in other countries (Holmqvist et al. 2012; Buckley et al. 2014; Smith et al. 2014). Since 2000 these clinics have been increasingly advocated as possible locations for IPE. Medical SRCs have been transforming to include a wider range of professions, and some clinics are now identifying themselves as interprofessional SRCs. They are staffed and managed by students from different professions and typically involve patient assessment and care planning by an interprofessional team of students (Meah et al. 2009). Functioning as free clinics they sit outside the US insurance reimbursement system removing a major barrier to interprofessional collaborative practice within the US.

Despite the suggestion that these clinics offer a potential setting for IPE (Sick et al, 2014), very little is known about if, or how, they work, or about the processes or outcomes of IPE within this setting (Shrader et al. 2010). The literature on interprofessional SRCs is very limited, the tendency is to describe the clinics but provide limited insight into outcomes beyond student self-reported outcomes. The connection between the programme inputs and outcomes is rarely articulated. This study hopes to address this knowledge gap through the in-depth exploration of a student-run interprofessional clinic. Focussing on identifying the clinic's processes and outcomes and developing programme theories that seek to explain how the clinic works for its various participants. This study adopts a realist evaluation approach to theory development addressing the questions of what works, for whom, in what circumstances, in which respects and why? Connecting the different aspects of the interprofessional intervention to the outcomes for different clinic participants, examining the mechanisms by which such outcomes are produced, and identifying how contextual factors within the clinic shape this pattern of outcomes.

## 1.2. Study aims and research questions

The aims of this study are:

- A. To gain insight into if, and how, an interprofessional student-run clinic, offering interprofessional education for pre-qualification healthcare students, works.
- B. To develop programme theories (hypotheses) identifying the outcomes for participants and making sense of how these outcomes are produced.

The study addresses two key research questions associated with these aims.

For interprofessional education for healthcare professional students in a student-run interprofessional clinic:

1. How did the programme designers expect it to work?

2. How did the clinic play out in practice? What worked, for whom, in which circumstances, in what respects, and why?

### 1.3. Need for the study

While they are proposed to be potent sites for interprofessional clinical learning student-run clinics have received very little attention in the literature. This study makes two important and original contributions to the interprofessional education literature. It provides a rare and in-depth examination of an interprofessional student-run clinic, and the use of a realist evaluation approach provides new ways of thinking about how interprofessional SRCs work.

The study arose from the interests and observations of the researcher and key issues identified within the literature for interprofessional education and student-run clinics. The researcher has observed the proliferation of student-run clinics within the US along with increasing interest and development of these clinics globally. They are promoted as important sites for interprofessional education yet they represent something of a black box issue. The literature on interprofessional SRCs is limited and there is a lack of understanding of if or how interprofessional education may work within these clinics.

The researcher was also challenged by the limited capacity of relevant systematic reviews, in particular, reviews of randomized control trials, to increase understanding of how interprofessional educational programmes for pre-professional healthcare students may work. There was also an awareness of repeated calls for new approaches to examining and evaluating interprofessional programmes that have the capacity to embrace its complex nature.

The use of a realist evaluation approach provides new ways of thinking about the design, delivery, and evaluation of interprofessional SRCs. Uncovering the programme theories for an interprofessional SRC offers the potential to explain how the interprofessional aspects of the clinic work for its various participants, and how contextual elements within the clinic shape its outcomes by changing the reasoning of its participants. This approach provides insight into the various aspects of an interprofessional intervention connecting these to its outcomes. It also connects the programmes inputs to its outputs through a detailed examination of the mechanisms and contexts of the IPE programme. Providing a description of the processes involved, the processes by which programme outcomes are achieved are not commonly addressed in the research relating to IPE endeavours.

### 1.4. Thesis overview

This thesis is presented in 6 chapters, this being the first. Chapter two presents the literature review, which commences with the presentation of important information regarding

interprofessional education (IPE) and interprofessional collaborative practice (IPCP). It then reviews the literature addressing student-run clinics and interprofessional student-run clinics.

Chapter three presents the study methodology, beginning with the adopted ontological, epistemological and methodological stance of empirical realism. It describes and provides justifications for, the selected qualitative study methods of a case study, qualitative semi-structured interviews and document analysis. It also identifies the steps taken to increase the trustworthiness of the study findings and address the ethical considerations inherent to the study.

Chapter four presents the case, the student-run interprofessional clinic, describing its context, structure, and function, and describing the study participants. It sets the context for the study findings presented in chapter five. With the aim of deepening insight and understanding of the interprofessional student-run clinic, chapter six takes a deeper dive into four key study findings. Discussing them with respect to the literature in the field and examining them through the lenses of sociological and psychosocial theories. It also makes recommendations for practice based upon these key study findings and includes a discussion of the application of the realist approach to uncovering programme theory within this study and addresses the wider implications for this approach within interprofessional education. The chapter concludes with the presentation of the study limitations, recommendations for the development and delivery of interprofessional student-run clinics, suggestions for future research, a reflection on the process of conducting this study and concluding remarks.



# Chapter 2: Literature Review

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## Introduction

This chapter draws together the pertinent literature related to this study and is presented in five sections. The first two sections review the literature for interprofessional collaborative practice (IPCP) and interprofessional education (IPE). Providing some key definitions and describing the logical argument for how IPE is expected to produce healthcare professional graduates who are prepared to engage in interprofessional collaborative practice. It describes the application of theory in the field, the nature of IPE activities, and examines the evidence regarding the outcomes of both IPE and IPCP. In so doing, it identifies concerns that arise when attempting to evaluate IPE using traditional approaches. It goes on to address some of these issues with respect to the complex nature of IPE endeavours and suggests that IPE be viewed as a complex social interaction proposing the need for new approaches to IPE evaluation.

Commencing with a description of the literature search strategy section 2.3 presents the results of a review of the literature pertaining to medical student-run clinics (SRCs), the precursors for interprofessional SRCs. It examines the evolution of SRCs as a care delivery model for uninsured, or underinsured individuals, and a venue for early clinical experience, predominantly for medical students, across the US. It presents the common clinic features, theoretical underpinning, management structure, and outcomes of SRCs for students, patients, clinician and faculty supervisors, and system-level outcomes. Section 2.4 specifically addresses the literature pertaining to interprofessional student-run clinics (IP SRCs), describing the transformation of medical student-run clinics into interprofessional SRCs that are suggested to serve as clinical, real world, experiential, interprofessional learning settings. It describes the specific form and function of interprofessional SRCs, their theoretical underpinnings, and the evidence regarding their outcomes.

## SECTION 2.1. Interprofessional collaborative practice

It has been evident for some time that collaboration between health professionals plays an important role in providing high-quality healthcare, and in mitigating errors (Barker 1964; Fendall 1972). Teams of health professionals engaging in interprofessional collaborative practice (IPCP) are believed to understand how to optimize the unique skills of each professional member to improve care, enhancing care quality, thereby reducing errors and improving patient outcomes (Barr et al. 2011).

As the complexity of patient needs has increased collaboration has become a more emergent issue (Cooper et al. 2004). Advances in healthcare delivery and medical technologies have increased life expectancy and survival rates from life-threatening events, with individuals living longer with more complex health needs (Cooper et al. 2004; McAlister et al. 2004; Frenk et al. 2010). In the US this has been compounded by the changing demographics of the US population, which has seen a shift to an increasing proportion of the population being older persons (Thistlethwaite 2012). Increasingly complex care requires healthcare providers to work collaboratively to ensure the delivery of safe, effective, high-quality care (Barr et al. 2011). Historically focused on the provision of acute care, the US healthcare system must change if it is to meet the increasingly complex needs of its aging population (Thistlethwaite 2012).

Patient safety has been a significant driving force for IPCP in the US. The Institute of Medicine's reports *To Err is Human* (Kohn et al. 2000), and *Crossing The Quality Chasm* (IOM 2001) identified failures in communication and collaboration as significant contributors to errors, which Makary and Daniel (2016) identified as the third leading cause of death in the US (if recorded in the same manner as other causes of death). This is not only a US phenomenon, for example in the UK the need for collaboration has been highlighted in high profile public enquiries e.g. the public inquiry into the deaths of children at the Bristol Royal Infirmary (Department of Health 2001). Such public inquiries demonstrated that poor collaboration between health and social care teams negatively impacts care continuity and can lead to serious errors. The Department of Health (DH) and other UK health and social care regulatory bodies responded to these concerns by introducing national benchmarks to enhance IPCP and reforming health and social care professionals' training to include IPE (Oandasan and Reeves 2005; Thistlethwaite and Moran 2010). Similarly in Canada, the Canadian Adverse Events Study (Baker 2004) highlighted the need to develop and support of IPCP prompting Health Canada to provide significant infusion of government funds to develop IPCP and IPE initiatives across Canada (Canadian Interprofessional Health Collaborative 2008).

Unlike the UK and Canada, which both had government mandates to introduce IPCP and IPE the US has seen few attempts to push IPCP at the national level. Lacking a national health system to support implementation, attempts have been locally based and subject to sporadic federal funding shored up by the support of philanthropic organizations (e.g. The Josiah Macy Foundation, The Robert Wood Johnson Foundation). The largest investment into creating a national agenda for collaborative practice came with the establishment of the United States National Centre for Interprofessional Practice and Education at the University of Minnesota in 2012. Funded by a public, private partnership, the centre is tasked with leading IPE and IPCP in the US, providing evidence and resources to guide the nation with

a focus on achieving the Triple Aim of enhancing the client's experience of healthcare, improving population health and reducing the overall cost of care (Brandt et al 2014; Berwick et al. 2008).

### 2.1.1 Outcomes of interprofessional collaborative practice

The many and varied benefits of IPCP have been articulated in the literature with reports of positive impact at the individual, health service, and societal levels (Reeves et al. 2008). These have included reduced mortality (West et al. 2006; Mickan et al. 2010) reduction in suicide in individuals with suicidal ideation (Jackson et al. 1993) improved patient safety, reduction in clinical errors and complications (Hallin et al. 2009; Morey et al. 2002) reduced length of hospital stay, reduced hospital admissions (Hammick et al. 2007) increased efficiency with reduced cost of care (Mickan 2005; Lemieux-Charles and McGuire, 2006) and improved access to and coordination of health services (Lemieux-Charles and McGuire 2006). Greater patient satisfaction and compliance with care recommendations have also been recognized for some time (Bellin and Geiger 1970; Baldwin et al. 1980). The impact of IPCP are particularly evident for individuals with complex and long-term conditions (McAlister et al. 2004; Holland et al. 2005; Interprofessional Health Collaborative 2009). Studies with older populations with complex needs have demonstrated lower mortality rate, fewer hospitalizations, reduced length of stay, more discharges to home, fewer drug prescriptions, greater satisfaction for patients and caregivers, improved morale and functional status, along with lower direct costs (Calland et al. 2011). System-wide improvements have also been evident as collaborative team-based care has been introduced as an approach to continuous quality improvement with a demonstrated impact on the procedures and processes of care delivery (Parenti et al. 1994; Turley et al. 1994). Cost-benefit and cost-effectiveness have been suggested although few long-term studies have been undertaken to address this (Baldwin 2007; Brandt et al. 2014).

### 2.1.2. Barriers to the implementation of IPCP

Despite recognition of the importance of IPCP and demonstration of positive impact on care the implementation of IPCP remains problematic. Baldwin (2007) suggests that such efforts are continuously hampered by professional territorialism and system inertia. A lack of understanding of the roles each profession plays in patient care, perceptions of boundary infringements, the adoption of defensive stances regarding scope of practice issues, limited and ineffective communication in practice, and a lack of practice models that provide appropriate opportunities to engage in well-coordinated teamwork, have been suggested as factors that perpetuate this tribalism and inertia (Hughes 1988; Reeves 2005; Barr 2015). In the US there has been difficulty gaining sufficient traction for system-wide implementation. Frenk et al. (2010) stressed the need for transformation of both the US healthcare and health education systems if collaborative interprofessional practice is to become a reality in the US.

## 2.2. Interprofessional education

IPE has been proposed as a route to creating future healthcare providers who are prepared to work collaboratively. Traditional education models for health professional students provide limited opportunities for students from different professional programmes to interact and do not prepare them with the necessary knowledge, skills, attitudes and behaviours for collaborative practice (Frenk et al. 2010; Barr 2012). Furthermore, they have been suggested to reinforce stereotypical perceptions of other professions, facilitate professional tribalism, and foster a hierarchical mentality (Baldwin 2007). In contrast, IPE provides opportunities for different professions to actively engage together. Learning about, from, and with each other and focussing on developing the specific knowledge, skills, attitudes, and behaviours necessary for effective collaborative practice. The expectation is that healthcare professionals who participate in IPE will be suitably prepared to engage collaboratively on entering the workforce. Such collaborative practice is expected to positively impact both care quality and patient outcomes (Hammick et al. 2007; WHO 2010; Barr et al. 2011). This argument is represented in Figure 1.



**Figure 1:** The argument for IPE

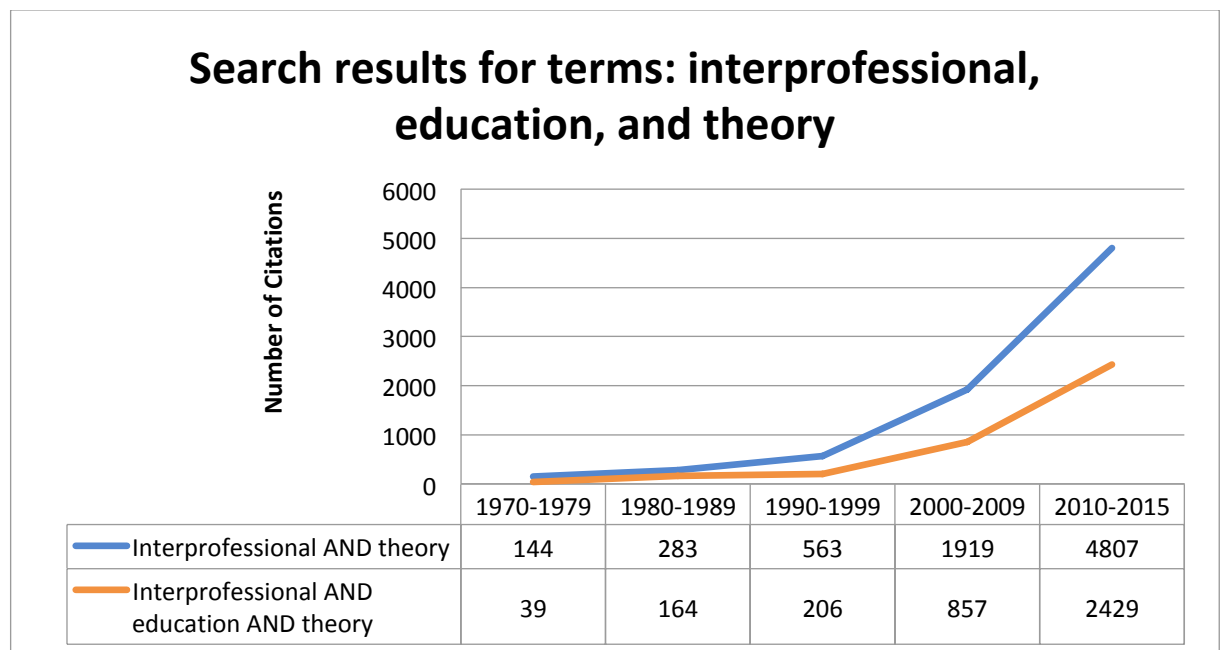
It is important to note that IPE has been advocated for both students training to enter their profession (pre-registration or pre-licensure) and for working clinicians (post-professional). Indeed IPE is regarded as a learning continuum extending from pre-licensure and throughout a health professional's career (D'Amour and Oandasan 2005; Brandt et al. 2014).

### 2.2.1 Theory use within IPE

Often referred to as being atheoretical, descriptive and anecdotal, IPE has been frequently criticised for lacking theory (Freeth et al. 2002; Barr et al. 2005; Clark 2006; Reeves et al. 2011). One could argue that this is no longer the case as a diverse range of theories from a wide variety of academic fields including, anthropology, education, organizational management, psychology, sociology, and team science, have been applied to IPE (Reeves et al. 2009; Hean et al. 2009).

Early attempts to identify a single overarching theory for IPE proved to be a fruitless endeavour, unsurprising given its complex nature. It is a humanistic endeavour heavily dependent upon human relationships, it is multifaceted addressing a wide range of concepts

in variable contexts, involving changes at the level of the individual, the group or team, and the system. Recognizing the complexity of IPE and the multifaceted aspects that can be examined, the field has engaged in some significant poaching from the wealth of theories available from other academies (e.g. social interaction theories, adult learning theories, systems theory). The current interest in theory is clearly evident when conducting a literature search on the topic. A search performed in Medline, PubMed, CINAHL, PsychINFO, ERIC using the terms interprofessional, education, and theory, revealed an exponential growth in interprofessional publications with an interest in theory from 2000-2017, and a significant upturn in publications after 2010 (see Figure 2).



**Figure 2:** Search terms interprofessional, education, and theory: Number of articles by years

In examining the retrieved articles it is clear that in the 1970's and 80s, when IPE was in its infancy, the articles reported on how theory was used by different professions. As the field has matured the direct application of theory to IPE and practice has become increasingly evident, and the variety of theories applied has significantly expanded. Early theories were reflective of the evolving educational approaches of the time with a focus on adult learning theories e.g. Kolb Learning Cycle used by Parsell et al. (1998). As attention turned to working in teams, social theories addressing interaction in groups became evident e.g. Contact theory used by Carpenter and Hewstone (1996) and Parsell et al. (1998).

Since 2010, there has been an almost three-fold increase in the volume of publications (283% rise) for IPE and theory. However, this does not mean that such theories have been

judiciously and effectively applied. For example, in a scoping review by Reeves et al. (2011) the retrieved studies made such limited use of theory that they were unable to include theory in their interprofessional framework. To understand how theory can be effectively applied requires examining the nature of theory.

#### 2.2.1.1. Theory, what is it and how is it used?

Jary and Jary (2000) describe theory as a set of propositions or hypotheses connected or linked through a rational argument. Colyer et al. (2005) state that such arguments must be based upon coherent, generalizable, and transferrable principles that are applicable continuously. Theory provides a practical means to explain, predict and summarize our observations and knowledge (Clarke 2006), propose explanations and provides testable propositions and hypotheses (Meleis 1997; Reeves et al. 2007). Theories may be implicit or explicit. Implicit theories also referred to as 'armchair' or 'lay' theories, are generated from personal constructions about particular phenomena. Merton (1968), classified explicit theories based upon their scope as, macro or grand theory, mid-range theory, and micro or practice theory. Grand theory is regarded as rather non-specific, being constructed from concepts that are relatively abstract and difficult to operationalize, as a consequence grand theories are difficult to empirically test. Mid-range theories address specific phenomena involving a limited number of concepts related to a small range of specific contexts. A micro or practice theory has the narrowest scope being focussed on specific phenomena and contexts.

#### 2.2.1.2. Theory use in IPE

With specific regard to IPE, it is widely asserted that careful consideration of the application of appropriate theory is necessary to move the field beyond the descriptive categorization of concepts to the development of propositions that can be empirically tested (Barr et al. 2005; D'Amour et al. 2005; Craddock et al. 2013; Hean et al. 2013). Theory can play a valuable role in the design and evaluation of interprofessional interventions (Hean et al. 2009; Hean et al. 2012). It has been argued that theory application can assist the articulation and understanding of interprofessional educational practice and support the design and evaluation of IPE curriculum (Clark 2006; Reeves et al. 2007; Hean et al. 2009). Clark (2006, p.578) suggests that theory can assist IPE instructional practice through addressing the questions of: what does it mean to "learn to do" interprofessional collaboration and how can educators best facilitate the achievement of these learning outcomes? To answer these two critical questions requires identifying major concepts that can guide course and programme structures, establish appropriate roles for students and faculty in the educational process, articulate learning objectives and effective methods for achieving them, and measure programme impacts and outcomes. Clarke (2006) suggests that the explicit use of appropriate theory can go a long way to addressing these issues. Theory has also been suggested as an approach to bridging the academic-practice gap. Consider that

theory is generated from our observations in practice, leading to the development of theoretical propositions, which are then confirmed or rejected by our observations in practice (Hean et al. 2012). As such theory can inform the development of practice, just as practice can inform theory. It has also been argued that theory can aid practitioners in reflecting upon their practice, facilitating second-order reflection, by which practitioners critically examining their practice by taking an external reflective viewpoint (Wackerhausen 2009; Hean et al. 2012). Theory has also been suggested to aid IPE facilitators to help students understand the rationale behind collaborative practice (Hean et al. 2009; Hean et al. 2012).

Theory is therefore proposed to help explain IPE, develop and evaluate interprofessional interventions, and connect education to practice. However, within the current IPE literature, theory is predominantly used in an implicit manner and it is argued that theory must be more explicitly used if the field is to progress. The theoretical underpinnings of IPE programmes should be explicitly described, as should the propositions addressed by the interprofessional intervention, such clear articulation should aid the selection and application of appropriate evaluation tools (Clarke 2006; Reeves et al. 2007).

This explicit theoretical connection between design, delivery, and evaluation, which is the focus of this study, is absent in much of the IPE literature. This study aims to identify the programme theory by connecting the various components of an interprofessional student-run clinic, addressing both the outcomes and the processes by which they are achieved. In so doing, this study is expected to achieve the recommendation previously described by Clark (2006). The programme theories will be expressed as propositions capable of empirical testing, as proposed by Hean et al. (2013). In effect making explicit that which is implicit.

#### 2.2.1.2. Reviews of theory use in interprofessional education

As the range of identified theories has expanded, several authors (Reeves et al. 2007; Hean et al. 2009; Suter et al 2013) have attempted to review theory use in IPE. The theoretical focus for these reviews of both IPE and IPCP are presented in Table 1.

Reeves et al. (2007) conducted a scoping review addressing the use of organizational and educational theories for IPE and IPCP, categorising current theories in use including, social psychology, sociology, adult learning, systems, psychodynamics, and organizational theories. New educational and organizational theories that may have potential use in IPCP and IPE were categorized according to their focus on the individual, the team or group, or the system or organization. Suter et al. (2013) presented a sub-set of the findings from this review focussed on systems and organizational theories.

Authors	Theory Focus
<b>Reeves et al. (2007)</b>  <b>IPE/ IPCP</b>	<b>Organizational and educational theories in use</b> <ul style="list-style-type: none"> <li>• Social psychology theory</li> <li>• Sociology theory</li> <li>• Adult learning theory</li> <li>• Systems theory</li> <li>• Psychodynamic theory</li> <li>• Organizational theory</li> </ul> <b>Potential theories</b> Learning level of, the individual, group or team, organization or system
<b>Hean et al. (2009)</b>  <b>IPE</b>	<b>Learning theories</b> Categorised by learning tradition <ul style="list-style-type: none"> <li>• Behaviourism</li> <li>• Constructivism - cognitive and social</li> </ul> Considered learning at the micro (individual), or macro (group) level
<b>Suter et al. (2013)</b>  <b>IPE/ IPCP</b>	<b>Systems and organizational theories in use</b> <ul style="list-style-type: none"> <li>• Organizational theories</li> <li>• Systems theories</li> </ul> <b>Potential theories</b> <ul style="list-style-type: none"> <li>• Organizational behaviour</li> <li>• Organizational change</li> </ul>

**Table 1:** Reviews of theory use in IPE and IPCP

Hean et al.'s (2009) review addressed learning theories that could assist the design or evaluation of IPE curriculum. Their aim was to provide assistance to practitioners in the field who may be overwhelmed by the plethora of available theories. They provided a framework to aid educators in the selection and application of learning theories to the development and/or evaluation of IPE. Learning theories were identified as belonging to two broad learning traditions, behaviourism, and constructivism. Behaviourist approaches focussed on outcomes expressed as behaviour and interprofessional competencies. Such theories are concerned with the outcomes of individual learners and view learning as a consequence of the learner's experience of their own behaviours and how their behaviours are modified in response to their actions and activities. This approach, with its focus on individual student outcomes, is common in uni-professional learning and appears to have carried over into IPE, as evidenced by the focus on outcomes rather than processes of learning within the literature. Clark (2006) speaks to this preference in his discussion of what a theory of IPE might look like. He suggests that curriculum developers have relied upon what they know from their uni-professional educational experience and such approaches fail to take the social nature of IPE into consideration. This is an important omission, as this social aspect of learning is a key factor that differentiates interprofessional learning from uni-professional learning.



In contrast to behaviourism, with its focus on outcomes, constructivism focuses on the learning process. Within the constructivist tradition Hean et al. (2009) subcategorized learning theories as cognitive constructivism or socio-constructivism. Cognitive constructivism is interested in the learner's experiences of the process. Key aspects are, how students create cognitive structures, problem-solve, develop higher order skills, and the level to which students are self-directed and actively engaged in their learning process. Socio-constructivism is concerned with the social aspects of learning. Focussing on the context of learning, involving the social encounters students experience and how students construct new knowledge and meaning through such collaborative encounters (Dewey 1966; Atherton 2009). This approach supports the need to address the social nature of interprofessional learning highlighted by Clark (2006).

The reviews by both Reeves et al. (2007) and Hean et al. (2009) address whether theory was used to address learning at the level of the individual (micro level), or group (macro level). The macro level could be argued to be particularly appropriate in interprofessional learning, given the interactive and social nature of such endeavours. While Hean et al.'s (2009) review identified learning theories from different learning traditions and highlighted some that may have utility in IPE curriculum development and evaluation; they found few examples of the explicit application of these theories within IPE curricular development or evaluation.

Each of these authors stressed the need for a toolbox approach to the selection of theory especially given the large range of potential theories available. Several additional authors have presented a range of considerations when selecting a theory or theories (Colyer et al. 2006; Clark 2006; Hean et al. 2012; Barr 2013; Clark 2013), which are listed below.

- Consider how theory may assist in both curricular design and evaluation
- Reflect upon the learning traditions and experiences of curricular designers that may influence theory selection
- Consider the dimension or dimensions of IPE on which the activity is focussed on addressing.
- Consider if the IP intervention is concerned with change at the level of the individual, the group, or the system/organization (micro or macro level).
- Consider the context and select a theory or theories based on their ability to increase understanding of IPE within a particular context
- Select the tool or tools that are the best fit for the task at hand
- Consider the use of multiple theories.

While it is clear that a range of possible theories and suggestions for their selection are available to IPE designers, it is evident within the literature that the judicious application of such theory to IPE design is not the norm.

### 2.2.2. Interprofessional learning activities

Active student engagement is argued to be an essential component of IPE (Barr 1996, 2002; Hammick 1998; Reeves 2005; WHO 2010; Thistlethwaite 2012). The *World Health Organisations Framework for Action on Interprofessional Education and Collaborative Practice* suggests that IPE is most effective when it uses the principles of adult learning, the learning involves participant interaction, and uses learning methods that are reflective of the reality of student's experiences in practice (WHO 2010).

A wide variety of interprofessional learning activities including, workshops, seminars, simulations, didactic courses, and clinical placements or fieldwork experiences, are evident in the literature (Hallin et al. 2009). Learning activities vary considerably, in the contextual setting (e.g. education or practice, hospital or primary care, acute or long-term care), participant population (e.g. pre-licensure or post-licensure), professional mix, timing (e.g. timing within the pre-licensure curriculum), duration (hours to months), and intended outcomes (Tunstall-Pedoe et al. 2003; Pollard et al. 2005; McIlwaine et al. 2007; Haller et al. 2008).

Reeves et al. (2011) conducted a scoping review aimed at providing conceptual clarity to interprofessional activities within the education and practice settings, by developing a theoretically based and empirically tested interprofessional framework. They examined how interprofessional activities were conceptualized, implemented, and assessed. Identifying three intervention types, interprofessional education (IPE), interprofessional practice (IPP), and interprofessional organization (IPO). IPE involved interventions that occur when two or more professions learn interactively to improve collaboration and the quality of care. IPP included activities or procedures incorporated into regular practice to improve collaboration and the quality of care. IPO involved changes at the organizational level (e.g. space, staffing, policy) to enhance collaboration and care quality (Reeves et al. 2011, p.169). Their framework addressed the participants, intervention type, objectives, and outcomes (intermediate, patient, and system). Despite a surge in publication of information regarding interprofessional activities, they described the area as continuing to be plagued by poor conceptualization.

The focus of this thesis is on pre-licensure IPE and in this area, they identified activities including simulation, seminars, workshops and courses, and placement or fieldwork experiences. Reeves et al. (2011) estimated one-third of IPE activities for pre-licensure students involve clinical placement experiences. The setting for this research study, the student-run interprofessional clinic, was not addressed by any of the included studies. This unique setting may be worth close attention as it may have the capacity to address IPE, IPP and IPO components for pre-licensure students as it is located within practice, and the students are responsible for both care delivery and clinic management. Such settings may

also provide opportunities to engage in systems-based learning (Colbert et al. 2010; Sheu et al. 2013). Reeves et al. (2011) describe IPO interventions as typically involving health professionals at a single site who collaborate together to change policies, culture, working practices, and physical space with an intention to improve process and outcomes. This argument will become more evident as the nature, purpose, and outcomes of student-run clinics are presented in sections 2.3 and 2.4.

### 2.2.3 Different forms of interprofessional work

Interprofessional education involves students working together in teams. Various models and taxonomies have identified key factors involved in teamwork (Sundstrom et al. 1990; Mohrman et al. 1995; Pritchard 1995; Cohen and Bailey 1997; Headrick et al. 1998; Reeves et al. 2010). These include a shared team identity, clear goals, and roles, interdependence of team members, integration of work, shared responsibility, and the predictability, urgency and complexity of team tasks. Reeves et al. (2010) specifically addressed these characteristics with respect to interprofessional work. Presenting these factors on a continuum identifying different forms of interprofessional work. These were networking, coordination, collaboration, and teamwork. Networking was represented at the lower end of the continuum involving participation in ad hoc groups, with flexible membership, as participants come and go, as their specific skills or expertise are needed. They engage in predictable non-urgent tasks and the arrangements for networks are typically informal (Ovretveit 1997). Shared goals, interdependence, or team identity are not emphasised.

Interprofessional coordination is more formally organised than networking, as it requires more frequent communication amongst care providers to ensure the provision of coordinated care. According to Gittell et al. (2000), such communication needs to be frequent, timely and accurate. Shared identity, integration, and interdependence are not emphasised but it does require some shared accountability and clarity regarding both the roles and goals of participation.

Reeves et al. (2010) described interprofessional collaboration as requiring shared accountability and interdependence for the tasks participants are undertaking, tasks that tend to be predictable and non-urgent. While the clarity of roles and goals is seen as necessary, there is less emphasis on a shared team identity or the integration of team members, than would be the case in interprofessional teamwork. Delva et al. (2008), suggest this type of work is highly typical of work within primary care settings.

Teamwork involves the development of a shared team identity, clarity with respect to team roles, tasks and goals, high levels of interdependence and team integration, and shared accountability and responsibility. Team tasks tend to involve higher stakes, be more complex, unpredictable, and be more urgent (Reeves et al. 2010)

A team has been defined as: *“two or more individuals with specified roles interacting adaptively, interdependently, and dynamically towards a common and valued goal”* (Salas et al. 2009, p. 561-562). Tuckman and Jensen’s (1977) model of group development describes several progressive stages thought to be involved in forming new teams: forming, storming, norming, performing and adjourning. The common characteristics of these various stages are presented in Table 2.

Forming	Storming	Norming	Performing	Adjourning
Get to know one another Form impressions about one another Consider their similarities and differences On their best behaviour Seek acceptance Behave independently Seek acknowledgement regarding the safety of the team Avoid potential conflict Rely on rules of behaviour Avoid discussing serious topics and feelings Task focussed Define and agree to team goals and task goals	More outspoken Raise issues and share opinions Accommodation of the opinions of others Involves competition and conflict Seek clarification of the rules, roles and responsibilities Some team members may withdraw, stop sharing their thoughts and ideas Possible dominance by some team members Learn to compromise Listening and problem solving	Share common goals Share responsibility for success Share leadership Engage in group problem-solving Resolve disagreements Increased cooperation Actively seek out opinions and ask questions of one another Group cohesion Develop trust A sense of belonging	Shared group identity Established group norms and roles Leadership and roles morph in response to need Focus on achieving their shared goals Focus on problem solving Interdependence Can work independently, in subgroups, or as a team Highly task oriented Highly people oriented Depth of personal relations	Completing the task Breaking up the team Recognition of contributions Giving up group membership

**Table 2:** Tuckman and Jensen’s stages of group development

Tuckman and Jensen’s model (1977) used a robust process in its development, including an extensive review of studies on group work and it has been extensively used within the team science literature. It is important to note that while this model is widely used its validity has not been fully evaluated and it has been criticised for providing an overly simplistic description of group development (Poole and Roth 1989; Buchanan and Huczynski 1997; Rickards and Moger 2000). However, a comparison of models addressing the stages of group or team formation by Jacques (1998) revealed a high degree of agreement with the stages identified by Tuckman and Jensen.

#### 2.2.4. Addressing the impact of interprofessional education

The IPE literature demonstrates the use of a wide range of terms to describe the impact of IPE activities. These include learning outcomes, learning objectives (Charles et al. 2004), competencies (Freeth and Reeves 2004), and capabilities (Gordon and Walsh 2005). With regards to the terminology used to describe the end goal of IP learning, Thistlethwaite and Moran (2010) found the term learning objective used most commonly to identify what the programme was expected to achieve. Competencies, capabilities, and outcomes were used to describe what the programme participants were expected to achieve.

A debate is evident within the field regarding the use of the terms competencies or capabilities. Capability refers to the extent to which individuals can adapt to change, generate new knowledge, and continue to improve their performance (Fraser and Greenhalgh 2001, p.799). Competencies are focussed on knowledge, skills, and attitudes,

and identify what an individual knows or can do. Interprofessional frameworks within the UK and Australia use the language of capabilities (Curtin University 2011) while frameworks from Canada and the US use the language of competencies (Canadian Interprofessional Health Collaborative (CIHC) 2010; IPEC 2011).

Competencies have been used for some time in health professional education in the US. Competency-based education focuses on defining what graduates are expected to be able to do in practice, as opposed to what they should know or demonstrate in training (capacities) (Thistlethwaite et al. 2014). In 2001, the US Institute of Medicine suggested that system redesign, in particular, developing effective teams, was essential to achieve care that was patient centred, safe, timely, effective, efficient, and equitable (Institute of Medicine (IOM 2001). Two years later they identified, patient-centred care, interdisciplinary teamwork, evidence-based practice, quality improvement, and informatics, as core competencies for all health professions education (IOM 2003). In response, health professional educational organizations within the US began (to various degrees) to implement changes in policy and accreditation standards to focus on teamwork training for health professional students (Cronenwett et al. 2007, 2009). While these efforts involved the development of standards for individual professions they did not set common standards across professions. However, it does suggest that health professional educational organizations were embracing the need for interprofessional collaboration and team training by implementing requirements for educational programmes to integrate these competencies into their curricula.

The Interprofessional Education Consortium (IPEC), an interprofessional organization formed by six US national professional organisations (dentistry, nursing, osteopathic medicine, medicine, pharmacy, and public health) drew this work together in the production of shared core competencies for collaboration (IPEC 2011). Through consensus working on IPE and IPCP definitions, teamwork and team-based care, agreement on competency definitions, and reference to existing US and global frameworks, models, and competency domains, IPEC developed a set of core competencies for IPCP (IPEC 2011). The four identified competency domains were: interprofessional teamwork and team-based practice, interprofessional communication practices, roles and responsibilities for collaborative practice, and values and ethics for interprofessional practice. The publication of these competencies resulted in their widespread adoption by a range of professions across the US, and an associated focus on the collaborative competencies within professional accreditation standards. Additional professional organisations (allied health professions, occupational therapy, optometry, physical therapy, physician assistants, podiatric medicine, psychology, social work, and veterinary medicine) clamoured to join IPEC, which has now expanded to include 15 professional organizations. The IPEC competencies have now been widely adopted across the US and are increasingly referred to in the objectives and proposed outcome of IPE activities.

### 2.2.4.1. Outcomes of IPE

A review by Thistlethwaite and Moran (2010) attempted to identify key learning outcomes of IPE that promote interprofessional practice. Their review, addressing pre and post-professional IPE, identified six prevalent outcome themes, teamwork, roles and responsibilities, communication, learning/reflection, the patient, and ethics/attitudes.

Teamwork was the most commonly described outcome. Reeves et al. (2011) presented a combined set of learning objectives for pre-licensure and post-licensure IPE within their previously described framework. These included teamwork, communication, role understanding, collaboration, leadership, interdisciplinary understanding/care/interaction, cooperation, interagency working, interprofessional working/practice/approach, relationship skills, and coordination. Specific intermediary outcomes for pre-licensure IPE were identified as, reactions, attitudes, awareness, knowledge, skills, and practice. No patient or system outcomes were identified for pre-licensure IPE within this framework.

Several classifications and typologies have been applied to IPE outcomes, the most common being Kirkpatrick's Typology of Educational Outcomes (Kirkpatrick, 1994). Kirkpatrick's work addressed the educational outcomes of workplace learning identifying four outcome levels, reactions, learning, behaviour, and results. Several authors have adapted this typology to fit certain circumstances, for example, Praslova (2010), adapted the typology to more closely reflect learning in the context of higher education. Of most relevance to IPE is the modified Kirkpatrick of Barr et al. (2000), who modified the typology to focus on the outcomes of IPE (see Table 3). This typology has been widely used in the literature to classify IPE outcomes.

#### Modified Kirkpatrick (Barr et al, 2000)

**Level 1: Learners' reactions** – Includes learner satisfaction and views of the learning experience

**Level 2a: Modification of attitudes /perceptions** – Addresses outcomes that pertain to changes in reciprocal attitudes towards patients, their condition, circumstances, care, and treatment, or perceptions between participant groups.

**Level 2b: Acquisition of knowledge /skills** - Knowledge of concepts, procedures, and principles of IP collaboration, Skills thinking problem/solving, psychomotor and social skills linked to collaboration.

**Level 3: Changes in behaviour** – Behavioural change transferred from learning environment to the workplace prompted by modifications in attitudes or perceptions, or applying new knowledge in practice.

**Level 4a: Change in organizational practice** - Changes in the organization or delivery of care attributed to the educational programme.

**Level 4b: Benefits to patients/clients** –Improvements in the health and well being of patients/ clients as a direct result of the educational programme.

**Table 3:** The modified Kirkpatrick typology addressing IPE outcomes (Barr et al, 2000)

#### 2.2.4.2. Examining the evidence for the outcomes of interprofessional education

A series of systematic reviews, narrative reviews, parallel reviews and scoping reviews have examined IPE from the 1990's to the present (summarised in Appendix 1). Following the trajectory of these studies provides valuable information on the attempts of the research community to evaluate the impact of IPE, and raises many questions. They catalogue the discourse in the field and the issues that have arisen as many authors have attempted to answer the question, “ does it work?”

Reflecting on the framework developed by Reeves et al. (2011) these reviews have addressed both pre-licensure and post-professional learners, including various combinations of outcomes related to IPE, IPP, and IPO. This section focuses on IPE for pre-licensure students and attempts to present the data regarding this particular topic. However, some overlap may be evident as pre-licensure and post-professional IPE are commonly discussed within the same review (e.g. Barr et al. 2000; Freeth et al. 2002; Zwarenstein et al. 2005; Hammick et al 2007; Reeves et al. 2010a, 2011, 2013, Brandt et al. 2014). Several reviews have focussed solely on pre-licensure IPE (Cooper et al. 2001; Zwarenstein et al. 2001; Davidson et al. 2008; Abu-Rish et al. 2012; Olson and Bialocerkowski 2014) and several have targeted only post-professional IPE (Zwarenstein et al. 1999; Reeves et al. 2010b). Reviews have varied in purpose, population, setting, methodological inclusion criteria, outcomes of interest, and quality assessment and review approaches, yielding varied results.

#### 2.2.4.3. Summary of key findings of systematic, narrative, parallel and scoping reviews

For pre-licensure IPE self-reported learner outcomes were the norm (Cooper et al. 2001; Freeth et al. 2002; Hammick et al. 2007; Davidson et al. 2008) with the modified Kirkpatrick typology commonly used to classify study outcomes (Hammick et al. 2007; Davidson et al. 2008). IPE was reported as being generally well received by learners with high ratings on satisfaction with the IPE activities or programmes (Cooper et al. 2001; Hammick et al. 2007; Davidson et al. 2008; Reeves et al. 2010a). Positive impact on knowledge and skill acquisition was evident (Cooper et al. 2001; Hammick et al. 2007; Davidson et al. 2008) with Reeves et al. (2010a) specifically identifying a positive impact on the knowledge and skills for collaborative working. Positive impacts on perceptions and attitudes were also identified in several reviews (Cooper et al. 2001; Freeth et al. 2002; Davidson et al. 2008) with Hammick et al. (2007) highlighting how evidence for changes in attitudes and perceptions towards others in the care team was less evident than for knowledge and skill acquisition.

Zwarenstein's (2001; 2005) reviews which focussed on patient and system level outcomes failed to retrieve any pre-professional articles for inclusion. The limited retrieval of papers may have resulted from the methodological criterion used for inclusion (randomized controlled trials, controlled before and after studies, interrupted time series and case-controlled time series), which may have excluded studies with potential to add insight to this topic. Two later reviews by Reeves et al. (2010a, updated in 2013) addressing both pre-licensure and post-professional IPE reported some evidence that IPE can improve the delivery of services and make a positive impact on care, however, these changes were noted in relation to only post-professional IPE. Post-professional IPE showed statistically significant and clinically relevant changes in patient outcomes (Zwarenstein et al. 2005; Reeves et al 2010a, 2013), professional practice (Reeves 2001, 2010a), and system level changes including process change (Zwarenstein et al. 2005; Reeves et al. 2013). Focussing on only pre-licensure studies Cooper et al. (2001) suggests that effects of IPE on professional practice were only minimally discernable.

In summary, there is some evidence of the impact of pre-qualification IPE on knowledge and skills, based largely on self-reported outcomes, with more limited evidence of changes in attitudes and behaviours, and minimal evidence of changes in system/organization or patient outcomes. The outcomes of pre-qualification IPE are often not made explicit, focusing on self-reported intermediary outcomes (student attitudes and satisfaction) rather than those pertaining to the impact of such training when students engage in patient care or join the healthcare workforce (patient and systems outcomes) (Rodger and Hoffman 2010; Reeves et al. 2011). Therefore a study examining the impact of student participation in an interprofessional student-run clinic involving students engaging in patient care in a clinical setting is argued to be likely to provide valuable information regarding learner, patient and system outcomes. As such this study may assist in illuminating how IPE impacts students and may lend insight into patient and system level processes and outcomes.

#### 2.3.4.4. Issues raised by these reviews

The authors of the reviews discussed in the previous section identified several important methodological challenges, which are summarized in Table 4.

##### **Methodological quality**

The identified concerns include the lack of methodological rigour in study design and concerns regarding the quality of evaluations (Cooper et al 2001; Reeves et al 2010a; Olson and Bialocerkowski 2014). Many papers are descriptive in nature providing limited information regarding programme structure, teaching and learning methods, evaluation process or outcomes (Reeves 2001; Freeth et al. 2002). Reviewers consistently report an over-reliance on self-reported outcomes, poorly developed outcome measures (Cooper et al, 2001) and inconsistency in the use of outcome measurement tools (Davidson et al. 2008; Reeves et al. 2010a).



<b>Intervention Variability</b>	Teaching and learning methods employed Facilitator preparation Focus or aims (may also have additional aims such as exposure to a certain specialty e.g. geriatrics) Duration and Intensity Location - didactic or classroom, clinical setting, e.g. acute care or primary care, specialty
<b>Participant Variability</b>	Professions involved Curricular level of participants Group size and composition Rates of participation Voluntary or mandatory participation Background of learners
<b>Outcome Variability</b>	Poorly developed outcome measures Inconsistent application of outcome measurement tools Mostly learner self-reported outcomes
<b>Differing Contexts</b>	Education or practice Practice setting Organizational context National and healthcare system context
<b>Theory Use</b>	Lack of theory use, or not implicitly stated Poor alignment of theory, design, and outcome measures
<b>Specific Issues for Systematic Reviews</b>	Heterogeneity in design (differing methodologies, methods, data collection methods, and analysis. Lack of methodological rigor Small sample size
<b>Complexity</b>	Difficulties in designing and implementing research protocols in complex environments to examine the effectiveness of complex interventions.

**Table 4:** Common challenges in conducting reviews of the IPE literature

### **Heterogeneity**

Reeves et al. (2013) suggest that although positive outcomes of IPE have been evident, making generalizations regarding the effectiveness of IPE is not possible given the small number of studies involved and their considerable heterogeneity. This is evident within the literature, which demonstrates variability in intervention structure, teaching and learning methods, duration, intensity, and frequency (Davidson et al 2008; Reeves et al 2010a; Reeves et al. 2010b). The purpose of the intervention also varies with the interprofessional agenda often being secondary to another aim such as exposure to a certain specialty (e.g. geriatrics), patient population (e.g. the underserved, the homeless), or activity (e.g. early clinical exposure, service learning).

The participants vary in the mix of professions involved, the representative numbers from each profession, group size, staging of the intervention in the curriculum, and the voluntary or mandatory nature of participation (Davidson et al 2008; Reeves et al 2013).

The location and context of studies include classroom, simulation settings, and various clinical practice settings (e.g. acute care, hospital care, primary care, community care) and variation in the organizational and national context, and as a consequence, the educational and healthcare system in which the IPE initiative is implemented. Olson and Bialocerkowski

(2014) called upon researchers in the field to ensure they take account of such contextual factors in designing and describing their interventions.

### **A lack of theory**

With regards to theory, reviewers have identified few studies explicitly using theory. Where used it was commonly poorly aligned with the intervention design, and outcome measures (Cooper et al. 2001; Reeves et al. 2011; Olson and Bialocerkowski 2014). Authors have highlighted the need for the explicit use of theory with better alignment of programme aims, objectives and outcome measures (Davidson et al. 2008) with Abu-Rish et al. (2012) calling for the identification of minimal reporting requirements for studies of IPE interventions.

### **Issues with review inclusion criteria**

It is interesting to note how study inclusion criteria were modified over the course of the reviews. Several of the early systematic reviews failed to identify any papers for inclusion and cited lack of methodological quality as the limiting factor (Zwarenstein et al. 1999, 2001). These studies used the Cochrane systematic review criterion allowing the inclusion of only randomized controlled trials, controlled before and after studies and interrupted time series. Zwarenstein (2001) extended the inclusion criterion with the addition of controlled clinical trials and later reviews included primary studies (Zwarenstein et al. 2005, Reeves et al 2013). To assist in retrieval of studies that may add knowledge to the field other authors have called for the inclusion of qualitative, quantitative and mixed methods studies (Barr et al 2000, Cooper et al 2001, Reeves 2001, Abu-Rish et al. 2012; Olson and Bialocerkowski 2014) and several review authors, citing the diverse nature of inquiry in the field, chose not to use study methodology as an inclusion criterion (Cooper et al. 2001; Hammick et al. 2007; Davidson et al 2008; Reeves et al. 2011, Brandt et al 2014).

Zwarenstein et al.'s (1999) systematic review of interprofessional education, which found no papers that met their selection criteria, had been part of the work of the Joint Evaluation Team for Interprofessional Education (JET). Hammick (2002) discussed the work of JET including this review along with a parallel review using the same data sources but expanding on the methodologies and outcomes explored, and the review of UK evaluations commissioned by the British Educational Research Association (BERA) in cooperation with the Centre for the Advancement of Interprofessional Education (CAIPE). This work addressed both pre-qualification and post-professional IPE. The aims of the parallel review included an examination of what is acceptable evidence of IPE effectiveness, the potential links between types of IPE and their outcomes, and the factors that may determine the effectiveness of IPE. In effect, this review was asking "what kind of IPE, under what circumstances, produces what kind of outcomes" (Hammick 2002, p.462). This article highlights many concerns in the identification of evidence for IPE that make a strong argument for the use of realist evaluation and Hammick et al. (2007) identified how their use

of realist terminology (context, mechanism, and outcomes) in the review process allowed new knowledge to be identified regarding some key mechanisms that act to influence the outcomes of IPE, including staff development, authenticity and customization of IPE activities. This thesis presents an argument for realist evaluation as an approach with potential to increase understanding of both the outcomes and processes of IPE. Having reviewed the literature regarding IPE and IPCP, the next section moves on to review the literature pertaining to the setting of this study, the student-run clinic.

## SECTION 2.3. Student-run clinics

Commencing with a description of the search strategy this section presents the results of a review of the literature pertaining to medical student-run clinics (SRCs), the precursors for interprofessional SRCs in the US. It examines the evolution of SRCs as a care delivery model for uninsured, or underinsured individuals, and a venue for early clinical experience, predominantly for medical students, in the US. It presents the common clinic features, theoretical underpinning, management structure, and outcomes of SRCs for students, patients, clinician/faculty supervisors, and for system-level outcomes.

### 2.3.1 Search strategy

Two reviews were conducted, the first aimed at gathering pertinent literature addressing the structure, function and outcomes of medical student-run clinics, the results of which are presented in this section. The second specifically addressed interprofessional SRCs and the results of this review are presented in section 2.4. Due to the complex nature of interprofessional endeavours, involving different professions from health and social care, and both the clinical practice and education settings a wide range of electronic databases including medical, health professional, social, psychological and educational literature sources were used. Medline, PubMed, CINAHL, PsychINFO, and ERIC were searched from 1960 (aligning with the time at which SRCs originated in the US) to 2017. The electronic search was supplemented by hand searching of specific journals with a focus on interprofessional education and practice (e.g. *Journal of Interprofessional Care*, *Journal of Interprofessional Education and Practice*, *Medical Education*, *Medical Teacher*), and the reference lists of retrieved articles. The search for relevant books was via an electronic search of library catalogues and Internet searches for books, policy documents and grey literature using the following search terms.

#### **Search terms:**

The terms student-run clinic, free student-run clinic, medical student-run clinic, free medical student-run clinic were used to search the literature on medical SRCs.

In searching for specific literature relating to IP SRCs these terms were combined with terms consistently used by authors of previous scoping and systematic reviews of IPE (e.g. Hammick et al. 2007; Reeves et al. 2010; Reeves et al 2011) Given the lack of clarity in the terms used within IPE, a broad range of terms were applied including, interdisciplinary, multi-disciplinary, multi-professional, interprofessional, and trans-professional. Cooper et al. (2000) highlighted the issues that this raises when attempting to conduct reviews of IPE, as the wide range of terms used to describe the same topic tends to lead to search strategies that retrieve a high number of articles but with limited precision. Although the search cast a rather broad net the limited number of publications regarding IP SRCs resulted in a small retrieved article set. The full list of search terms is presented in Appendix 2.

## Search objectives and questions

To assist with focussing the review process specific search objectives and questions were identified.

- What is the structure of SRCs / IP SRCs
- How do SRCs / IP SRCs function
- How has theory been used in the design and delivery of SRCs / IP SRCs
- What are the outcomes of SRCs / IP SRCs

**Data extraction:** A data extraction sheet was developed for each search (see Appendix 2) and outcomes were categorised using the Kirkpatrick typology of outcomes for the review of medical SRCs and the modified Kirkpatrick, which specifically addresses IP outcomes, for the review of IP SRCs.

## Inclusion and exclusion criterion

The inclusion and exclusion criterion are presented in Table 5.

Inclusion criteria	Exclusion criteria
SRC identified as the focus of the study	The paper is not focussed on a student-run clinic
The clinic is student-run	The clinic is not a student-run clinic
The students are predominantly pre-professional students	The students are predominantly post-professional students
The clinic involves a primary care setting, not an in-patient setting	The clinic is in an in-patient setting
<i>The IP aspects of the clinics are described in the paper</i>	<i>The IP aspects of the clinics are not described in the paper</i>
Publication in English	The paper is published in a language other than English
Qualitative, quantitative and mixed model studies	
Primary and secondary research articles, editorials, letters, commentaries, theses, policy documents, and books	

*\*Additional criterion for the IP SRC review shown in italics*

**Table 5:** Inclusion and exclusion criteria.

## Search results for the review of medical SRCs

The search identified 152 articles relating to SRCs published between 1985 and 2015. Removal of duplicates resulted in 148 and further review of the inclusion and exclusion criterion (12 studies identified as not being student-run clinics) dropped the total to 136. These were used for examination of the structure and function of SRCs. With a specific focus on the outcomes of SRCs, 63 articles were excluded, on the first review, as they did not report outcomes, made only a general reference to outcomes, or made claims regarding outcomes but failed to provide any supporting data to substantiate their claims. A total of 73 articles were identified for the review of outcomes of medical SRCs.

### 2.3.2. Emergence of medical student-run clinics

Student-run clinics (SRCs) began to emerge in the US in the 1960's spurred by a generation of health professional students focused on advocacy and activism. This was the time of the social change movement in the US during which university campuses experienced a significant increase in the level of student activism. Opposed to the leadership of the country and unhappy with the US culture, university students protested and demonstrated on civil rights and anti-war issues. It was in this cultural melting pot that medical students, in response to social concerns such as a rising homeless population and limited access to healthcare services for many individuals, began to develop student-run clinics in cities across the US (Gilkey and Earp 2006; Meah et al. 2009; Wee et al. 2011).

Simpson and Long (2007) defined a medical student-run clinic as:

“ A health care delivery programme in which medical students take primary responsibility for logistics and operation management during clinic hours and which is capable of prescribing disease-specific treatment to patients” (Simpson and Long 2007, p.353).

Amongst the earliest reported student-run clinics were the Student Family Health Care Centre, at the University of Medicine and Dentistry of New Jersey, New Jersey Medical School (Zucker et al. 2011), and North Carolina's Student Health Action Coalition (SHAC), both of which began in 1967. Their common focus was on providing free care to individuals who were homeless. Since that time medical student-run clinic have become increasingly prevalent with 75% of medical colleges across the US reported as having an SRC with 208 SRCs currently operating (Smith et al. 2014). Student-run clinics have also begun to emerge in other countries such as Australia (Kent and Keating 2013; Buckley et al. 2014; Haines et al. 2014), Canada (Khorasani et al. 2010; Holmqvist et al. 2012; Haggarty and Dalcin 2014), Denmark (Vildbrand and Lyhne 2014), Singapore (Wee et al. 2011), and the UK (Goodier et al. 2015; Weidmann 2015).

Literature regarding student-run clinics did not emerge until 1985 with the publication of Campos-Outcalt's examination of the specialty career choices of medical students who had participated in the University of California Davis, student-run community-based free clinic (Campos-Outcalt 1985). Several articles began to emerge during the 1990's that provided descriptions of various SRCs across the US, including the Asian Clinic at the University of California Davis (Pi 1995), The Arbor Free Clinic at Stanford (Yap and Thornton 1995) and a student and faculty clinic at the University of Wisconsin Madison (Haq et al. 1996). Common features shared by these clinics were: their focus on providing care to homeless individuals through the use of medical student volunteers; the conception, organization and management of the clinics were under the auspices of the students; and clinical services that were provided by medical students under the supervision of volunteer physicians.

The 2000's saw a substantial proliferation of student-run clinics across the US, and in 2000 the first Canadian SRC, the Community Health Initiative by University Students (CHIUS), was established in Vancouver, British Columbia (Khorasani et al. 2010). While the US SRCs were predominantly medical, the Canadian clinics were conceived and designed as interprofessional clinics from the beginning. The development of SRCs in Canada coincided with Health Canada's national initiative for IPE and IPCP bringing substantial national level funding to such efforts.

It is interesting to note that the Canadian definition of an SRC is decidedly different to that in the US with a very clear focus on the interprofessional nature of the student-run clinic.

“Canadian student-run clinics are interprofessional community service-learning initiatives where students plan and deliver clinical and health promotion services, with the assistance of licensed healthcare professionals” (Holmqvist et al. 2012, p.264).

There are currently reported to be 10 SRCs in Canada (Ambrose et al. 2015) with the majority operating out of community health centres and all reporting to be interprofessional in nature.

It is important to note that the nature of the health systems within different nations in which SRCs are established does impact the clinic in several ways. In the US, which does not have a universal healthcare system, clinics provide care to the uninsured and underinsured that do not have access to healthcare or have limited access (Simpson and Long, 2007). In countries with universal healthcare such as Canada, Australia, and the UK, SRCs are providing care to those who experience issues accessing available services, such as the homeless and rural populations (Holmqvist et al. 2012, Buckley et al. 2014). In the latter instance, SRCs may play an important role in connecting clinic patients to available resources and in providing health promotion. In the US, in addition to these roles, the SRC may serve as the only option available for patients to receive care. Meah et al. (2009) suggested that in the US SRCs are valuable contributors to the healthcare safety net for individuals who are uninsured or underinsured, expanding the safety net by adding SRCs to the services provided by healthcare practitioners in private volunteer-operated free clinics.

### 2.3.3. Structure and function of medical student-run clinics

Three surveys, conducted from 2004 to 2014 have provided valuable insight into the structure and function of SRC's across the US. All three relate to medical SRCs and no studies were identified that focus on IP SRCs. Lung (2004) provides limited information as the survey was published in the form of a research abstract. It provides information on thirty-three SRCs established between 1968 and 2003 that responded to a mailed survey. The clinics provided care to the uninsured and a third of the clinics specifically focused on individuals experiencing homelessness. They provided a range of medical specialties including, adult medicine, obstetrics and gynaecology, and paediatrics. The most commonly

provided services included, urinalysis, serum chemistries, CBC count, serum lipid levels, glucose testing, Papanicolaou test, pregnancy tests, and gonorrhoea and chlamydia testing (Lung, 2004).

Simpson and Long (2007) provided a more comprehensive report of the state of US SRCs reporting the results of a national web-based survey of medical SRCs administered to 124 colleges that were members of the American Association of Medical Colleges (AAMC). Ninety-four schools responded and 111 medical SRCs were identified, located within 49 medical schools and spread across 25 states. The survey showed a significant increase in the establishment of SRC's from the late 1990's to the early 2000's, with an average length of clinic operation being just 7.4 yrs.

Clinics were located at homeless shelters or community agencies, hospitals, churches, rented buildings, state-run health clinics, mobile units, and other unspecified locations. The majority of clinics operated once a week providing free care to uninsured patients primarily from minority populations, (Hispanic 31%, Black 31%, White 25%, Asian 11%, Native American and other 3%). Clinics saw an average of 15 patients per week with around a third of the patients presenting with acute or emergent complaints, a third for monitoring of chronic health problems, and the remainder for check-ups, physicals, or to pick up their repeat medications. The clinics referred patients for services they could not provide, including referrals to the emergency department, local public health centres, associated academic medical centres, and public hospitals. Laboratory tests were performed onsite or through partnerships with outside organizations at 81% of the responding SRCs and 79% dispensed a range of prescribed drugs. Students managed the clinics and were also responsible for establishing partnerships with clinic sites, laboratory service providers, medication sources, and for seeking funds to support clinic operations.

With regards to the SRC manpower, Simpson and Long (2007) reported volunteer students, supervised by volunteer physicians, staffed the clinics. The majority of student volunteers were medical students, including preclinical medical students, (this term is used in the US for medical students who are in their first 2 years of medical school and who have not yet been on clinical placement), plus clinical medical students (medical students in the 3rd and 4th of their studies and who are in clinical placements). A third of the responding clinics reported they also had volunteer students from health-related graduate programmes, and a third reported using undergraduate students. Non-health related graduate students and high school students were also present at a small number of clinics.

Physicians on the faculty at the university were present at all of the responding clinics, with half of the clinics supplemented by non-faculty volunteer physicians. Around a quarter of clinics also reported having volunteer nurses and social workers, with a fifth identifying other professional health workers as supporting the SRC. Although faculty was present in the



clinics, Simpson and Long (2007) stated that most of the teaching within the SRCs was reported as being led by students, primarily by the senior medical students. They were not able to make an assessment regarding the quality of clinical education occurring within the SRCs and their survey did not evaluate the impact of the SRC.

Lung (2004) described a large variation in the reported clinic annual operating budgets, ranging from \$200 to \$100,000, with a mean annual operating budget of \$17,352. Simpson and Long (2007) reported similar findings with the annual operating budgets of responding clinics ranging from \$500 to \$95,000, with a mean operating budget of \$18,889 (median \$12,000). The major sources of clinic funds being private or community grants and student fundraising, with some supplemental funds coming from the medical school or university associated with the SRC, and government grants.

Smith et al. (2014) attempted to update Simpson and Long's survey but using a different approach to survey dissemination. On this occasion, SRCs were identified through the Society of Student-Run Clinics. The Society was established in 2010 with the aim of drawing together SRCs across the nation to collectively advocate for policy and resources to support SRCs and the needs of those individuals they serve ([www.studentrunfreeclinics.org](http://www.studentrunfreeclinics.org)). The survey was emailed to student leaders of SRCs that were housed at member organizations of the AAMC. The results relate to 86 institutions that reported having at least one SRC, with a total of 208 SRC sites identified. Smith et al. (2014) reported the number of AAMC member institutions with an SRC had more than doubled in the 9 years since Simpson and Long's (2007) survey, with 75% of medical schools in the US reporting to have a least one SRC (mean of 2.4 SRCs per school). As with the previous surveys, the majority of patients attending the clinic (90%) were uninsured. Smith et al. (2014) provided additional information on the population being served, reporting that for more than half of the clinics, over 80% of their patients were under the federal poverty level, with the most commonly treated conditions being diabetes and hypertension.

Some differences between the results reported by Simpson and Long (2007) and those reported by Smith et al. (2014) could suggest that during the intervening years between surveys, SRCs had become mainstream which is reflected in changes in the location of clinics, inclusion of clinics as curricular components and the introduction of paid faculty and administrative staff at some SRCs. When Simpson and Long (2007) conducted their study, the greatest number of SRCs were located in homeless shelters (32%) while Smith et al. (2014) reported around 80% of SRCs being housed at community clinics (51%), or medical office buildings (28.2%).

With regards to the educational component of the SRC, a shift was apparent from SRCs being a student-driven volunteer service opportunity, to SRCs becoming a medical

curricular component, either as an elective (35.8%) or as a component of the core curriculum (11.1%). While Smith et al. (2014) reported that student volunteers remained the main workforce at the clinics, almost half of the clinics identified that recruiting and retaining sufficient faculty volunteers had become a major clinic concern and clinics were beginning to report the inclusion of paid staff, including faculty (12 clinics) and administrative staff (20 clinics).

As for funding, although the mean clinic budget had risen over the intervening 9 years between surveys, from \$18, 889 to \$48,653, the range and median showed no real change (median \$12,000, range \$0 -\$100,000), and funding was identified as a major challenge by a third of SRCs.

A limitation of all 3 surveys (Lung, 2004; Simpson and Long 2007; Smith et al. 2014) was their sole focus on medical school SRCs, as such they did not include SRCs hosted by other professional schools, nor did they focus on programmes that reported to be interdisciplinary, multi-professional, or interprofessional in focus. However, Smith et al. (2014) did address the representation of other professions within the responding SRCs. Of the 86 medical schools that responded, 62 (72.9%) reported having interprofessional partners involved in the SRC. Table 6 shows the reported interprofessional partners, both students and faculty/clinicians from professions other than medicine, as reported by Smith et al. (2014).

While the representation of other professions within the clinic may be considered to provide opportunity for IPE within the SRC the nature of the relationship between professions was not described, raising the question of whether these clinics were operating as interprofessional or multi-professional clinics.

Students	No of clinics (%)	Clinicians / Faculty	No of clinics (%)
Pharmacy students	36 (43.9)	Pharmacists	34 (41.5)
Nursing students	25 (30.5)	Nurses	36 (43.9)
Social work students	23 (28.1)	Social workers	34 (41.5)
Physician assistant students	20 (24.4)	Physician assistants	8 (9.8)
Dental students	19 (23.2)	Dentists	15 (18.3)
Legal students	6 (7.3)	Lawyers	5 (6.1)
Pre-health professional <sup>a</sup>	45 (54)		
Public health students	31 (37.8)		
		Community volunteers	33 (40.2)

<sup>a</sup> Undergraduate, post baccalaureate, master's, or PhD students who wish to enter health professional school

**Table 6:** Reported interprofessional partners at SRCs (adapted from Smith et al. 2014)

### 2.3.4. Management of medical student-run clinics

A literature review by Meah et al. (2009) focussing on medical students and systems-based practice within SRCs adds some valuable insight into how SRCs are managed. Meah and colleagues suggested the US healthcare system is currently facing a crisis in the cost and quality of care, with a high number of individuals lacking insurance or having insufficient insurance coverage (Meah et al. 2009, p.345). The premise for their review was that SRCs provide significant opportunities for medical students to engage in experiential learning related to these system issues. Their search retrieved just 20 articles highlighting the limited research in this area. It was evident that students were responsible for the management of the daily operations of the clinics and for complex administrative tasks necessitating the application of problem-solving skills. Table 7 provides a summary of the tasks identified by Meah et.al. (2009). No studies identified the provision of any training for students regarding these tasks or the systems-based practice issues they were addressing (Poulsen 1995; Beck 2005).

Meah et al.'s review focused on medical students and as such missed drawing on clinics that may have been operated by or included other professions. Four of the included articles describe the clinic as multidisciplinary, interprofessional, trans-disciplinary, or as involving more than medical students (Steinbach et al 2001; Clark et al 2003; Bennard et al 2004; Beck 2005). However, this review did not address the role of students from other professions in the management or operation of the clinic.

Task	Components
<b>Managing Clinic Flow</b>	<ul style="list-style-type: none"> <li>• Patient registration and scheduling</li> <li>• Daily patient, student volunteer, ancillary staff, and physician workflow</li> <li>• The delegation of student, physician, and interdisciplinary staff duties</li> <li>• Daily and weekly follow-up of patient issues and turnover to ensure continuous patient care</li> <li>• Clinic site organization, maintenance, and assurance of adequate supplies</li> </ul>
<b>Design, Modification, and Sustainability</b>	<ul style="list-style-type: none"> <li>• Development of and adherence to clinic mission statement</li> <li>• Design and implementation of student leadership and managing annual turnover</li> <li>• Resource acquisition and cost-effective allocation of resources to patients</li> <li>• Successful incorporation of interdisciplinary personnel</li> </ul>
<b>Outreach and Community Presence</b>	<ul style="list-style-type: none"> <li>• Creation and sustainment of community partnerships and outreach efforts</li> <li>• Alignment and realignment of activities to meet the goals of the community</li> </ul>
<b>Student education</b>	<ul style="list-style-type: none"> <li>• Oversight of student clinical teams</li> <li>• Direct the student educational mission of the clinic</li> <li>• Oversight and direction of clinic-based research</li> </ul>
<b>Quality Evaluation and Control</b>	<ul style="list-style-type: none"> <li>• Understanding evaluating and ensuring best practices</li> <li>• Understanding clinic population needs and continuously modifying clinic services and structure</li> </ul>

**Table 7:** SRC administrative tasks (adapted from Meah et al. 2009)

### 2.3.5. Medical SRC leadership models

A limited volume of literature is available regarding the leadership structure of student-run clinics. Drawing on literature that provides descriptive accounts of clinics, a common structure for SRC management appears to be through a clinic leadership board, with students elected to positions on the board by their peers. They may be undergraduate students seeking to move into a health professional programme (e.g. the Berkeley Suitcase Clinic, Steinbach et al. 2001), or may be undergraduate or graduate health professional students (Smith et al. 2014), and they may or may not have undergone some orientation or training to prepare them for the role (Steinbach et al. 2001; Beck 2005). Boards may be supported by sub-groups, often referred to as panels, responsible for specific aspects of the clinic (e.g. communications, resource management, fundraising, quality assessment). They are often supported by faculty liaisons serving as conduits between the students and the university administration.

### 2.3.6. Outcomes of medical SRCs

This section addresses the outcomes of SRCs that are not interprofessional SRCs. The specific outcomes of IP SRCs are presented later in section 2.4. Of the 136 retrieved articles from the review of SRCs (predominantly medical SRCs), 73 identified outcomes in sufficient detail for inclusion. The remaining 63 did not report their clinic outcomes, made only a general reference to outcomes, or made claims regarding outcomes but failed to provide any supporting data to substantiate such claims. Therefore 73 articles are included in the review of the outcomes of student-run clinics, 41 (56.16%) addressed student outcomes, 20 (27.40%) patient outcomes, 9 (12.32%) system level outcomes, and 4 (5.48%) addressed faculty or clinician supervisor outcomes. The outcomes, classified using Kirkpatrick's typology, (see Table 8) address learner reactions (level 1), the acquisition of knowledge, skills, and attitudes (level 2), and changes in behaviour (level 3). In Kirkpatrick's typology, results (level 4) includes organization practice change (changes in care delivery), consumer /patient satisfaction, benefits to patients and employee morale, attributed to the educational programme.

The following section presents student outcomes (Kirkpatrick levels 1-3) followed by Kirkpatrick level 4 outcomes including the identified patient, system and faculty/clinician preceptor outcomes.

#### 2.3.6.1. Student outcomes

Student outcomes were addressed to various degrees in 40 individual studies and one systematic review of student learning and participation in medical SRCs (Schutte et al. 2015). The identified student outcomes addressed Kirkpatrick levels 1, 2 and 3.

Outcome	Authors
<b>Kirkpatrick Level 1: Learners' reactions</b>	
<b>Student satisfaction</b>	Clark et al. (2003); Robinson et al. (2004); Gu et al. (2012); Doyle et al. (2012); Choudhury et al. (2014); Riddle et al. (2014); Hua et al. (2015)
<b>Student perceptions of the SRC</b>	Smith et al. (2012); Nakamura et al. (2014); Davis et al. (2015); Shabbir and Santos (2015)
<b>Kirkpatrick Level 2: 2a. Modification of attitudes /perceptions 2b. Acquisition of knowledge /skills</b>	
<b>Attitudes to working with the underserved or homeless</b>	Clarke et al (2003); Doyle et al. (2012); Jones et al. (2014); Smith et al. (2014)
<b>Student confidence / competence</b>	Clarke et al. (2003)
<b>Experience as peer mentors</b>	Hamso et al. (2012); Choudhury et al. (2014).
<b>Professional skills and competencies</b>	Nakamura et al. (2014)
<b>Medial student grades</b>	Stoddard and Risma (2011); Vaikunth et al. (2014)
<b>Kirkpatrick Level 3: Changes in behaviour</b>	
<b>Medical students choice of future career, residency or specialty</b>	Campos-Outcalt (1985); Tong et al. (2012); Smith et al. (2014); Vaikunth et al. (2014); Shabbir and Santos (2015)
<b>Application choice</b>	Gu et al. (2012).
<b>Kirkpatrick Level 4: 4a. Change in organizational practice 4b.Benefits to patients/clients</b>	
<b>Patient Outcomes</b>	
<b>Clinical end-points</b>	<b>Diabetes</b> - Ryskina et al. (2009); Gorrindo et al. (2014); Smith et al. (2014) <b>Hypertension</b> - Zucker et al. (2011) <b>Hyperlipidaemia</b> - Rojas et al. (2015) <b>Tuberculosis</b> - Peluso et al. (2014) <b>Depression</b> -Lieberman et al. (2011) Soltani et al. (2015) <b>Preventative Care</b> - Butala et al. (2012; 2013) <u>Smoking Abstinence</u> - Der et al. (2001); Spector et al. (2007); Lough et al. (2011)
<b>Patient satisfaction</b>	Ellett et al. (2010); Clark et al. (2014); Riddle et al. (2014); Dekker et al. (2015)
<b>System Outcomes</b>	
<b>System-based practice</b>	Colbert et al. (2010); Sheu et al. (2013)
<b>Cost</b>	Dvoracek et al. (2010); Stuhlmiller and Tolchard (2015)
<b>Quality Improvement</b>	Butala et al. (2013)
<b>Economic evaluation</b>	Hua et al. (2015)
<b>Utilization evaluation</b>	Campbell et al. (2013)
<b>Insurance coverage</b>	Niescierenko et al. (2006)
<b>Faculty / Clinician Supervisor Outcomes</b>	
<b>Faculty / clinician satisfaction</b>	Dekker et al. (2015)

**Table 8:** The outcomes of SRCs

### **Kirkpatrick Level 1: Learners' reactions – including learner satisfaction and views of the learning experience**

Eighteen studies addressed student satisfaction consistently reporting high levels of student satisfaction with the SRC experience with students reporting the experience as being clinically relevant.

### **Kirkpatrick Level 2: 2a. Modification of attitudes and perceptions and 2b.acquisition of knowledge and skills**

Changes in attitudes to working with the populations served by the SRCs, in particular the homeless and uninsured populations, were identified with students reporting increased understanding of the issues facing individuals from such populations (Clarke et al 2003; Doyle et al. 2012; Jones et al. 2014; Smith et al. 2014). Students believed they gained knowledge of health disparities and developed skills in accessing resources for these patient populations (Sheu et al. 2012).

Students also reported changes in confidence levels with regards to their clinical skills and feeling more competent in the clinical environment (Clarke et al. 2003;). They identified increased competence in profession-specific skills such as patient assessment and examination Nakamura et al. 2014).

Two studies examined the impact of participation in an SRC on students medical school grades, the premise for these studies related to concerns regarding the potential impact of the significant time commitment for students participating in SRCs on medical course performance. No difference was evident in student course grades between students who participated and did not participate in an SRC (Stoddard and Risma 2011; Vaikunth et al. 2014).

Hamso et al. (2012) addressed student perceptions of peer mentoring in an SRC using a combination of surveys, interviews and focus groups to explore senior medical students experiences in teaching as peer mentors. These students began to perceive themselves as teachers during the experience and felt their ability to teach impacted the quality of the learning experience for their peers.

Choudhury et al. (2014) explored the perceptions of first-year medical students towards their fourth-year mentors with first-year students reported to be highly satisfied with the mentoring provided and reporting the presence of senior student mentors enhanced their ability to interact with the attending physicians at the clinic.

### **Kirkpatrick Level 3: Changes in behaviour**

Six studies were identified that addressed changes in behaviour. Campos-Outcalt (1985), Tong et al. (2012), Smith et al. (2014), Vaikunth et al. (2014) and Shabbir and Santos (2015) examined if participation in an SRC impacted the choice of future career, residency or specialty for medical students. Gu et al. (2012) examined whether the presence of an

SRC at a medical school influenced a student's decision to apply to or attend that school. The results of Gu et al.'s (2012) study were inconclusive regarding application to medical schools with SRCs. As for residency, specialty or future career choice, the evidence suggests that although students who participate in an SRC may self-report the intent to select primary care this may not play out in reality. Campos-Outcalt (1985) found students who participated in an SRC were more likely to select primary care residencies (internal medicine, family medicine, and paediatrics) and two studies (Smith et al. 2014; Shabbir and Santos 2015) reported that participation in an SRC increased student interest in working in primary care settings. However, Tong et al. (2012) and Vaikunth et al. (2014) evaluated the data on residency choice and did not find SRC participants pursuing primary care specialties or practising in primary care settings at a significantly higher percentage than those who did not participate in an SRC.

#### **Kirkpatrick Level 4 – Results**

The following section presents the literature on patient, faculty and clinician supervisors, and system level outcomes for medical SRCs, all of which represent Kirkpatrick level 4 outcomes.

##### **2.3.6.2. Patient outcomes**

Patient outcomes included patient satisfaction and clinical outcomes and were addressed to various degrees in 20 articles.

#### **Patient clinical outcomes**

Although many studies list clinical measures or clinical outcomes such as blood pressure and diabetic clinical markers (haemoglobin A1c and blood glucose) as measures of the impact of the SRC on patients (e.g. Beck 2005; Spector et al. 2007) only eleven papers provided data regarding such outcomes. One provided such data in isolation (Peluso et al. 2014) while eight compared clinic outcomes to national standards, guidelines, and benchmarks. These studies provide valuable information regarding care quality in an SRC as they compared the outcomes of an SRC to optimal care. These studies are either disease-specific addressing conditions such as diabetes, hypertension, and hyperlipidaemia, or focus on preventative care. There is, however, some significant overlap between disease-focused studies and prevention studies as both provide screening and patient education.

Diabetes - Three studies, Ryskina et al. (2009), Gorrindo et al. (2014), and Smith et al. (2014), employed a retrospective chart review to examine the impact of care in an SRC on clinical markers for diabetes. Ryskina et al. (2009) reported on the outcomes of diabetes care at the East Harlem Health Outreach Partnership, Mount Sinai School of Medicine, New York. Using a chart review of individuals with type 1 and type 2 diabetes they identified the

following patient outcomes and process measures: HbA1c monitoring, HbA1c levels, lipid panel monitoring, LDL, Nephropathy monitoring, BP, retinopathy screening, foot exams, aspirin prophylaxis, and influenza and pneumonia vaccination rates. They compared the data for the SRC to published data for these measures for uninsured people, local and national data on Medicaid recipients, and local and national data for those with private insurance. The SRC performed well against the published data, showing higher rates of HbA1c and nephrology monitoring, aspirin prophylaxis, and eye and foot exams than for those with public, private, or no insurance.

Gorrindo et al. (2014) described clinical outcomes over a 1-year period for patients at the Shade Tree Clinic, Vanderbilt University who participated in a patient health education programme in which medical students served as a diabetes coach. An interesting aspect of this study was the analysis of the relationship between patient outcomes and the number of patient-student interactions. They demonstrated a trend of improving HbA1c values with the increased number of student-patient encounters. Although screenings were provided and patient diabetic related outcomes improved, only low to moderate percentages of patients met the benchmarks for HbA1c, BP, and LDL as outlined by the American Diabetes Association.

Smith et al. (2014) reported on the work of the SRC at the University of California San Diego. They identified the percentage of patients who received the recommended screenings for HbA1c, BP, lipid panels, and eye exams. They also examined the percentage of patients that achieved recommended target levels for cholesterol, microalbumin/creatinine ratio, HbA1c, and BP. They reported that patients who received care at the SRC met or exceeded the published rates for both insured and uninsured individuals with diabetes in both screening rates (excluding eye examinations), and clinical outcome measures, and demonstrated significant improvement in glycaemic control, BP, and cholesterol levels. From these studies, it would appear that the quality of care delivered to patients with diabetes in these SRCs matched or exceeded that for individuals receiving care in traditional settings.

Hypertension - Zucker et al. (2011) specifically addressed hypertension. Zucker et al. (2011) reported on the outcomes of patients with hypertension who received care at the Student Family Health Care Centre, at the University of Medicine and Dentistry of New Jersey. They conducted a chart review over a 1 year period, with the outcomes of interest being, BMI, BP, comorbid conditions, number of visits, medication prescription, and smoking status of individuals with hypertension. They compared their data with the *Healthy People 2010* quality standards and the *Joint National Committee on Prevention, Detection, and Treatment of High Blood Pressure* (JNC 7) guidelines. Their results were comparable to other studies on hypertension that were conducted in more traditional care settings. They



met both the pharmacology standards as outlined in JNC 7 and the blood pressure goals outlined in *Healthy People 2010*.

Hyperlipidaemia - While many of the previously mentioned studies included lipid panels in their assessment measures, Rojas et al. (2015) specifically examined the impact of care on hyperlipidaemia at the University of California San Diego, Student-run Free Clinic Project. They conducted a four-year retrospective chart review examining outcomes for newly diagnosed patients with hyperlipidaemia who received care at one of three SRC sites. They reported 58.3% of patients achieved their LDL goals with and a mean drop in LDL from 135.8 to 101.3mg/dL and 86.5% of patients being prescribed a statin. These rates of control exceeded the national standards.

Tuberculosis - Peluso et al. (2014) reported on the work of the Latent Tuberculosis Initiative at the HAVEN Free Clinic, Yale University. This study provided data drawn from a retrospective chart review, including patient clinical and demographic characteristics, risk factors, screening history, treatment outcomes, appointment and medication adherence, liver function test results, and reported side effects. Around two-thirds of patients completed the necessary nine months of treatment, and Peluso and colleagues suggest the results at this SRC are comparable to the highest published programme results of 50-60% completion rates.

Depression - A single study, Liberman et al. (2011) addressed the management of depression at the East Harlem Health Outreach Partnership, Mount Sinai School of Medicine. This was the same SRC in which Ryskina et al. (2009) examined outcomes for patients with diabetes. As with the earlier study at this site, they compared the data for the SRC to published local and national data on Medicaid recipients, and local and national data for those with private insurance. They used the Healthcare Effectiveness Data and Information Set (HEDIS) quality indicators for mental healthcare. These included demographics, diagnostic methods, pharmacological agent treatments, specialty referral, and adherence to follow-up care and medication. They found that compared to both Medicare and private insurance, patients in the SRC received better acute and continuous pharmacology treatment and received the recommended number of physician follow up appointments after a diagnosis of depression. The clinic also exceeded the recommended standards for diagnostics, specialty referral, and medication adherence.

Preventative Care - Six studies (Der et al. 2001; Spector et al. 2007; Sheu et al. 2010; Lough et al. 2011; Butala et al 2012; Butala et al. 2013) specifically addressed preventative care services. Butala et al. (2012) reported on the rate of preventative care services at the HAVEN Free Clinic, Yale University (this is the same clinic as Peluso et al. 2014, described earlier). Screening rates for HIV, lipid panel, blood glucose, although matching nationwide

rates, did not meet national goals specified in the *Preventive Screening Guidelines of the U.S. Preventive Services Task Force (USPSTF)* and *Healthy People 2020*. Pap smear rates matched the rate for those without insurance but fell below the national rate and did not meet the national goals. Following the results of this study, students at the SRC initiated a quality improvement (QI) initiative reported in a follow-up article by Butala et al. (2013). The initiative involved prompting for screening for HIV, diabetes, hyperlipidaemia, and cervical cancer. The clinic introduced a new position of Medical Records Specialist whose role was to review patients charts prior to their appointment date and identify any necessary screening, vaccinations, or follow-up issues that need to be addressed. These were annotated in the patient's record in a manner to prompt the clinical team who see the patient on their next visit to address these issues. This QI initiative increased adherence to screening guidelines for HIV testing, lipid panel, and blood glucose, but not for Pap smears.

Sheu et al. (2010) reported on the work of the SRC operated by the University of California, San Francisco, which focused on chronic hepatitis B viral infection in the Asian/ Pacific Islander population. The SRC provided screening, education, and vaccinations. Of those individuals found to be susceptible to hepatitis B infection, 90% were reported to have completed or been completing the recommended schedule of vaccinations. It is interesting to note that this high rate of vaccination was achieved in a population of first-generation migrants with limited English proficiency. The SRC reported that they provided interpreters speaking 9 different languages and dialects and suggested that this was integral to the high vaccination rates achieved by the clinic.

Three studies examined the outcomes of smoking cessation programmes offered by SRCs, Der et al. (2001) and Lough et al. (2011) reported on the Salvation Army Good Samaritan Free Clinic at the Mayo Medical School in Rochester, Minnesota, and Spector et al. (2007) on a programme at the University of Michigan. All three studies involved smoking cessation programmes for homeless individuals. This population has been identified as having high prevalence rates for smoking, psychiatric illness, substance abuse, and serious health conditions that can impact programme adherence (Lough et al. 2011). Yet all three studies demonstrated reduced smoking prevalence and increased long-term abstinence rates similar to those reported by more conventional treatment programmes. Der et al. (2001) reported a smoking abstinence rate of 18% at 6 months post-intervention and in the same clinic some ten years later, Lough et al. (2011) reported one third of programme participants abstained from smoking for 7 days, and 13.8 % for more than 4 weeks post-intervention. Spector et al. (2007) showed a reduction in smoking frequency and a drop in mean carbon monoxide levels following cognitive behaviour therapy and unstructured support.

## **Patient Satisfaction**

Four studies identified patient satisfaction as an outcome measure and provided supporting data (Ellett et al. 2010; Clarke et al. 2014; Riddle et al. 2014; Dekker et al. 2015). Ellett et al. (2010) presented results from the Community Aid, Relief, Education and Support clinic at the Medical University of South Carolina. A patient satisfaction survey was administered at the completion of each visit. The survey included 11 items and a 5-point Likert scale (poor to excellent) rating of satisfaction with certain clinic services. The overall satisfaction was 98%, with mean scores for all items on the Likert scale ranked as very good with the exception of waiting time (good) and operating hours (Fair). Patient's suggestions included additional opening hours (evenings or daytime hours), the provision of prenatal care services, and the use of Spanish translators. These suggestions led to changes in the clinic operations.

Clark et al. (2014) addressed patient perceptions of care provided by medical students in comparison to that provided by licensed physicians at the Jackson Free Clinic, University of Mississippi. They administered a 37-item questionnaire, modelled on the Primary Care Assessment Survey (PCAS), addressing perceived exam thoroughness, trust, and overall patient satisfaction, to patients following an examination by either medical students or by a physician. They did not find differences between physicians and students for perceived thoroughness, trust, or overall satisfaction scores. Dekker et al. (2015) reported on patient satisfaction with an SRC for insured patients with a focus on pharmacotherapeutics. As with Clark et al. (2014), the patient satisfaction questionnaire addressed patient satisfaction with a consultation provided by a student compared to that provided by a physician. Issues addressed included, communication skills, professional behaviour, overall judgment on the consultation and their willingness to return to the clinic. Student satisfaction scores were compared with those for physicians.

Riddle et al. (2014) reported on the patient survey administered at the Weill Cornell Community Clinic, New York. The survey used a 5-point Likert scale (poor – excellent) response in relation to questions regarding, the helpfulness of clinic staff (students, and physicians), quality of care received, and overall satisfaction. In response 87% of patients reported being very or extremely satisfied with the care received, 96% would recommend the clinic to others, and student helpfulness, courtesy, thoroughness, competence, and communication of the treatment plan was rated as excellent or good by 80% of respondents.

### **2.3.6.3. System-level outcomes**

In all, 8 papers addressed impacts at the system level including system-based practice, cost, quality improvement initiatives, and economic or utilization evaluation.

### **Access to insurance coverage**

Niescierenko et al. (2006), reported on work at the Lighthouse Free Medical Clinic at the University at Buffalo where medical students helped patients enrol in government-sponsored insurance plans. They identified 319 uninsured patients who attended the clinic during the study period, 59 of whom were eligible for insurance coverage. Fifty-seven applications for insurance were initiated, and 23 (40%) were completed and accepted. They concluded that a significant number of people using the free clinic were eligible for insurance coverage and suggested that student involvement in the SRC can help address access to insurance coverage for these individuals.

### **Systems based practice**

Colbert et al. (2010) used focus groups to identify system-level issues which students believed impacted care access or delivery they identified six key themes; limited access to specialist care, cost containment, lack of resources, care delay (lack of insurance), delay in tests (language barriers) and understanding of the larger healthcare system and the role played by the free clinic.

### **Cost and economic evaluations**

Three papers reported on either economic evaluations (Hua et al. 2015), or cost (Dvoracek et al. 2010; Stuhlmiller and Tolchard 2015). Two addressed the cost savings to the health service as a result of free services delivered at an SRC. Hua et al. (2015) examined care provided to 20 patients at a US podiatric SRC and calculated a cost saving to the healthcare system of \$17,332.13 and Stuhlmiller and Tolchard (2015) estimated cost savings to the health service of \$430,000, in a single year of service at an SRC in Australia. Examining the implementation of a new cost-control measure (medication management using a closed formulary) on drug use, financial performance and patient care, Dvoracek et al. (2010) reported reduced medication expenditures for the clinic and retained care quality.

### **Quality improvement**

Butala et al.'s (2013), previously discussed study described a quality improvement (QI) initiative implemented by students in an SRC involving prompting for screening for HIV, diabetes, hyperlipidaemia, and cervical cancer. The clinic introduced a new position of Medical Records Specialist whose role was to review patients charts prior to their appointment date and identify any necessary screening, vaccinations, or follow-up issues that needed to be addressed. These were annotated in the patient's record in a manner to prompt the clinical team who see the patient on their next visit to address these issues. This QI initiative increased adherence to screening guidelines for HIV testing, lipid panel, and blood glucose, but not for Papanicolaou (Pap) smears.

### **Utilization evaluation**

Founded on programme planning and evaluation theory, in particular utilization-focused evaluation, Campbell et al. (2013) assessed the actual and perceived role of the clinic, goal clarity and expectations among stakeholders. They conducted individual and group semi-structured interviews with students, staff, faculty, potential clients, and stakeholders from collaborating organizations. They identified three themes, benefits of the SRC, barriers and future directions. Benefits were reported as improving access to primary care services for the homeless, and empathetic care delivery. Identified barriers included infrastructure, personnel, care continuity, clinic location and lack of student knowledge and experience. Future directions for the clinic were identified as increased collaboration with other organizations serving the homeless, a focus on acute care, and expansion of the available services to include more clinic sites and specialty services. Information from this utilization evaluation was used in planning and implementing the SRC.

#### **2.3.6.4. Faculty / clinical preceptors outcomes**

A single study from the Netherlands (Dekker et al. 2015) used questionnaires and semi-structured interviews to examine faculty clinician satisfaction with participation in a medical SRC. They reported positive supervisor experiences and high levels of satisfaction. Problems with the clinic flow and limited time, especially for debriefing students were highlighted as concerns.

### **Section summary**

This section described the evolution of medical SRCs identifying their structure, function, and outcomes. The following section details how in the US these clinics are transforming into IP SRCs and presents the results of a review specifically addressing IP SRCs for which the literature is quite limited in volume and content.

## SECTION 2.4 Interprofessional student-run clinics

This section specifically addresses the literature pertaining to interprofessional student-run clinics (IP SRCs), describing the transformation of medical student-run clinics into IP SRCs, the specific form and function of IP SRCs, their theoretical underpinnings, and the evidence regarding their outcomes.

Following the search strategy identified in section 2.3.1, forty studies involving SRCs using the terms interdisciplinary, multi-professional, interprofessional or trans-professional were retrieved. The majority (25) involved SRCs in the US, however, since 2010 studies describing IP SRCs in Canada (8), Australia (3), Singapore (1), and more recently in the UK (1) and Denmark (1) have emerged. Appendix 3 identifies these papers by authors, year of publication and country in which the SRCs were operating. Thirty-five studies specifically described the clinic as an IP SRC however some authors used the term to refer to the presence of more than medical students in the clinic describing more of a multi-professional environment. When the retrieved articles were evaluated with regards to the definition of IPE only 11 studies (presented in Table 9), provided sufficient information on the interprofessional aspects of the clinic, to be clearly designated as such.

Year	Authors	Term*	Country
2006	Mosckowitz et al.	IP	US
2010	Khorasani et al.	IP	Canada
	Shrader et al.	IP	US
2011	Guirguis and Sidhu	IP	Canada
2012	Holmqvist et al.	IP	Canada
2014	Buckley et al.	IP	Australia
	Seif et al.	IP	US
	Sick et al.	IP	US
	Vander-Wielen et al.	IP	US
2015	Ambrose et al.	IP	Canada
	Schwartz et al.	IP	US

**Table 9:** Retrieved articles that clearly met the definition of IPE

### 2.4.1. Transformation of medical SRCs to interprofessional SRCs in the United States

While Canadian SRCs have originated as interprofessional clinics, US SRCs have been undergoing a transformation from medical SRCs to interprofessional SRCs. Terms such as interdisciplinary, multidisciplinary, and interprofessional began to appear in the US SRC literature from the mid-1990's (Yap and Thornton 1995) with the term interprofessional being more consistently used over the subsequent two decades. Although clinics claimed to be

interprofessional or even transprofessional it is clear that many were referring to the presence of more than just medical students in the clinic with few describing the interprofessional components of the clinic. Most of these clinics used a side-by-side service delivery model mirroring current primary care practice of consultation and referral to other professions rather than an interprofessional collaborative team approach to care.

Health professional education programmes have struggled to find clinical placement sites that can offer IP experiences for their students (Shrader et al. 2010). SRCs have been highlighted as potential alternative venues for clinical IPE (Swartz 2012). They have been suggested to provide innovative learning spaces for collaboration (Kent and Keating 2013), bringing students from different professions together with the shared purpose of meeting the needs of the underserved. Being student-run has been argued to increase student engagement and ownership, promoting IP collaboration (Dugani and McGuire 2011). SRCs are argued to provide IPE in an authentic clinical environment involving working together on patient evaluation and care planning, which is suggested to support students gaining knowledge and understanding of the roles of different professions within the context of real patient care (Sick et al, 2014). IP SRCs are proposed to provide students with mentorship from peers and senior students from their own and other professions, fostering respect (Holmqvist et al. 2012) and creating opportunities for role modelling of collaborative practice by clinical preceptors from multiple professions (Shrader et al. 2010). Students participating in IP SRCs are believed to experience team-based care in a supervised and supportive environment, developing their professional skills and knowledge alongside their collaborative competencies (Khorasani et al. 2010; Morello et al. 2010, Holmqvist et al. 2012). Clinic management roles within the SRC have also been suggested to allow students to collaborate together in unique roles providing opportunities to engage in collaborative systems-based learning (Meah et al. (2009).

#### 2.4.2. Theoretical underpinning of IP SRCs

No studies explicitly reported the use of theory in the design or delivery of the clinic. A single study (Sick et al. 2014) explicitly referenced theory, using contact theory to explain the findings from their US prospective observational cohort study addressing IP attitudes and skills (communication, teamwork, attitudes to IP learning, relationships and interactions - Kirkpatrick levels 2a and 2b) in students who participated in an IP SRC compared to those who applied to participate and were not accepted, and those who never applied. They reported a reduction in IP attitudes for students over time for all students with the decline being less for students who participated in the IP SRC. They suggested experience in the IP SRC may serve a protective effect against declining IP attitudes and skills suggesting the extended time students spend together in the clinic, working together in conditions that contact theory suggests foster positive group interactions (e.g. a cooperative environment,

common goals and positive expectations, and institutional support (Carpenter and Hewstone 1996) could assist participants to retain positive IP attitudes.

Across the remaining studies, the most commonly presented theoretical concepts were service learning (Shrader et al, 2010), contextual learning, and interprofessional learning (Reeves et al, 2005). The reference to these concepts was implicit and the application of such concepts to the design, delivery or evaluation of the clinic was not evident. For example with respect to a Canadian interprofessional SRC, Holmqvist et al. (2012) identified community service learning as the underlying approach in the clinic which they described as an educational approach combining community service with explicit learning objectives, preparation, and reflection, focused on developing social accountability. They also described using interprofessional learning to develop collegial relationships, understand complementary roles, practice collaborative competencies, and provide an increased range of services deepening impact on the community. However other than reporting on the inclusion of a debriefing session, they did not demonstrate how these concepts were applied in the clinic.

#### 2.4.3. Stated interprofessional aims and objectives of IP SRCs

Although several clinics identified a clinic mission, purpose and or objectives most did not include specific IP learning objectives or aims. Claims were more generally expressed, for example, Robinson et al. (2004) reported that their interdisciplinary model of diabetes care was intended to enhance future collaboration, providing cross-training and immediate onsite consultation. Moskowitz et al. (2006) suggested that the IP SRC allows students to gain insight into other professions, strengthening relationships and developing collaboration. Sheu et al. (2010) reported the aim of their clinic as shared learning and mutual respect. Seif et al. (2014) proposed involvement in the SRC would increase participant perceptions and attitudes for working in IP healthcare teams and enhance clinical reasoning skills. Sick et al. (2014) identified IP attitudes and skills, in particular, communication, teamwork, attitudes to IP learning, and relationships and interactions, while others referred to students developing the IPEC collaborative competencies (Shrader et al. 2010; Schwartz et al. 2015). Khorasani et al. (2010, p. 40) provided the following description that tied the learning methods to suggested outcomes within a Canadian IP SRC.

" By employing a range of teaching and learning strategies through small group learning, the clinic provides an ideal opportunity to engage in a clinical setting mediated by respect, mutual trust and enhanced understanding of each other's profession. It will also allow students to better recognize their own limitations while familiarizing them with the valuable resources offered by other healthcare professions to complement patient care while mitigating inaccurate attitudes and perceptions based on stereotypes and assumptions".



It could be argued that the student-run nature of SRCs limits the potential for developing an interprofessional experience founded on educational best practices. Dubouloz et al. (2010) describe an IP rehabilitation primary care clinic that was designed and managed by faculty, and as such was not student-run, they clearly articulated the clinic's interprofessional model, mission and theoretical framework, identified specific cognitive and affective IP learning objectives and their approach to outcomes evaluation. This is a stark contrast to the student-run clinics, which unsurprisingly lack a sound pedagogical foundation.

#### 2.4.4. Interprofessional activities occurring within IP SRCs

Several clinics described orientations, courses, electives, or workshops that students and or mentors were required to take before working in the clinic. (Shrader et al. 2010; Westra et al. 2011; Ambrose et al. 2015). Westra et al. (2011) described the need for such orientation to be robust covering safety issues and clinic policies and procedures. No clinic reported providing specific training on IP collaborative practice or IPE for the supervising clinicians.

The most common interprofessional activity identified within the literature was the use of student pairs (Ellett et al. 2010; Sheu et al. 2010; Wang and Bhakta 2013; Danhausen et al. 2015), or teams of 3 or 4 students from different professions working together to assess patients (Moskowitz et al. 2006, Shrader et al. 2010; Westra et al 2011). Senior students, most often from medicine, are added to these student teams as peer mentors and may assist the team in conducting a physical examination. The teams typically present their findings to a clinical supervisor or supervisors. They may present to a single professional supervisor, most commonly a physician (Steinbach 2001; Ellett et al. 2010) although three clinics reported nurse practitioners and physician assistants also serving in this role (Danhauser et al. 2015; Lawrence et al. 2015, Schwartz et al. 2015). Several clinics described student teams presenting to a multi-professional or interprofessional team of clinical supervisors (Dugani and McGuire 2010; Shrader et al. 2010; Westra et al 2011; Danhausen et al. 2015). A plan of care was developed with the assistance and oversight of supervising clinicians and the students and a supervisor, usually a physician then returned to see the patient together. The physician or supervisor may perform an examination, including any further tests identified during the discussion with the student team, and the plan of care is discussed with the patient. Westra et al. (2011) reported the entire IP team of students and supervisors within their SRC saw the patient together at this point.

Several SRCs reported a post clinic reflection component was included in the clinic experience (Clark et al. 2003; Beck 2005; Shrader et al. 2010; Westra et al 2011; Seif et al. 2014). Clark et al. (2003) described a reflection facilitated by a clinical psychologist, and Beck (2005) described a learning circle where each participant reflected on their learning experience (Beck 2005). Weekly written reflections were included as part of the combined didactic and SRC IP elective described by Shrader et al. (2010) and Seif et al. (2014).

#### 2.4.5. Clinic roles within IP SRCs

Buckley et al. (2014) was the only study to explicitly describe the unique management roles within their Australian IP SRC, including a shift supervisor (a senior student who triages the patient and selects the IP team), student clinicians (senior students who conduct an IP consultation), and a client liaison (a junior student who serves as a client advocate). Junior students also served as reception staff greeting clients and arranging follow-up appointments and referrals. Several clinics reported the use of patient advocates, student caseworkers, or case coordinators (Steinbach et al. 2001; Beck 2005; Westra 2011; Wang and Bhakta 2013) who meet with the patient on their arrival at the clinic and accompany them throughout their visit. At the end of the visit, they may assist them with making follow up appointments and referrals to other services. Students from pre-health programmes are often involved as clinic staff e.g. receptionists, which was argued to provide an opportunity for them to see an IP team at work (Steinbach et al. 2001; Beck 2005).

#### 2.4.6. Clinic management in IP SRCs

Interprofessional SRCs are managed in a very similar manner to medical SRCs with a student executive board but composed of students from different professions who were elected by their peers. The boards typically operate through sub-committees with responsibility for specific clinic functions (Holmqvist et al. 2012), and faculty advisors or advisory panels may provide institutional support to these boards (Clark et al. 2003; Dugani and McGuire 2011; Westra et al. 2011).

Scott and Swartz (2015) surveyed medical, nursing, and public health students regarding their experience on an IP SRC leadership board (at the Haven clinic, Yale University). They postulated that IP learning and practice experiences on the board would increase participant knowledge regarding other professions, improve their ability to work collaboratively, and encourage them to pursue leadership roles. High levels of satisfaction with the experience were self-reported by students along with improvements in their attitudes towards IP collaboration.

#### 2.4.7. Commonly identified problems and issues for interprofessional SRCs

The literature identifies common issues and problems in the operation of IP SRCs, which are listed below.

- Difficulty obtaining student volunteers from different professions (Moskowitz et al. 2006)
- Problems with the availability of sufficient faculty/clinician supervisors (Schwartz et al. 2015) specifically interprofessionally trained supervisors (Khorasani et al. 2010)
- Varied levels of commitment of the faculty to IPE (Khorasani et al. 2010)
- High student turnover as they move into their careers (Dugani and McGuire 2011)

- Problems with patient flow through the clinic (Holmqvist et al. 2012; Ambrose et al. 2015)
- Clinic sustainability (Holmqvist et al. 2012) with integration into the curriculum suggested to achieve sustainability (Khorasani et al. 2010)
- Insufficient funding (Khorasani et al 2010; Holmqvist et al 2012)
- Providing care continuity (Khorasani et al. 2010; Holmqvist et al. 2012; Buckley et al 2013; Ambrose et al. 2015)
- Insufficient time or opportunities for students to engage with other professions (Morello et al. 2010)
- Insufficient time for student debriefing (Ambrose et al. 2015)
- Malpractice and liability concerns (Holmqvist et al 2012) and legal issues related to cross-professional supervision (Ambrose et al. 2015)
- Students who spend limited time in the clinic feel uncomfortable working with patients (Ambrose et al. 2015, these students only attend the clinic one time)

#### 2.4.8. A review of the evidence for outcomes of interprofessional SRCs

Only 13 studies of IP SRCs reported their outcomes. These studies have been grouped according to their study methods with outcomes classified using the modified Kirkpatrick typology (Barr et al 2000) (See Table 10). Outcomes included learner reactions (level 1), modification of attitudes and perceptions and acquisition of knowledge and skills (level 2), and results (level 4). No studies were found that addressed behaviour change (level 3).

##### 2.4.8.1. Questionnaires and surveys

In the US, Shrader et al. (2010) used a pre-post email survey to assess student participants in an elective interprofessional course that included service in an IP SRC. The survey was a self-developed 17-item tool addressing student attitudes to IP healthcare, professional roles, and teamwork (Level 2a). Eight questions from the Readiness for Interprofessional Learning Scale (RIPLS) were included and the remaining questions, developed by the evaluators, addressed student confidence in working in IP teams, the role of IP teamwork in the future, and understanding the roles of specific professions. The survey was not validated. They found no difference pre to post-intervention for any of the RIPLS items but significant differences were found in the investigator developed items regarding professional role understanding with significant changes in participant understanding of the role of the PA in the IP team (Level 2b). Also in the US Sheu et al. (2011) surveyed medical, nursing, and pharmacy students who participated in a Hepatitis screening IP SRC identifying student self-reported increases in role understanding, teamwork, and collaboration.

Outcome	Authors
<b>Kirkpatrick Level 1: Learners' reactions</b>	
<b>Student satisfaction</b>	Morello et al. (2010); Wee et al. (2010; 2011); Westra et al. (2011); Holmqvist et al. (2012); Ambrose et al. (2015)
<b>Kirkpatrick Level 2: 2a. Modification of attitudes /perceptions 2b. Acquisition of knowledge /skills</b>	
<b>Attitudes to working with the homeless</b>	Beck (2005)
<b>Sociocultural attitudes</b>	Sheu et al. (2012)
<b>Student confidence</b>	Morello et al. (2010); Westra et al. (2011)
<b>Professional skills and competencies</b>	Morello et al. (2010); Westra et al. (2011)
<b>Clinical reasoning</b>	Seif et al. (2014)
<b>Kirkpatrick Level 4: 4a. Change in organizational practice 4b. Benefits to patients/clients</b>	
<b>Patient Clinical Outcomes</b>	Hypertension - Wee et al. (2011); Sheu et al. (2010)
<b>Patient satisfaction</b>	Wee et al. (2011); Lawrence et al. (2015)
<b>System-based practice</b>	Sheu et al. (2013)
<b>Quality Improvement</b>	Ambrose et al. (2015)
<b>Cost</b>	Haines et al. (2014)
<b>Faculty / clinician satisfaction</b>	Ambrose et al. (2015); Guirguis and Sidhu (2011); Sheu et al. (2013)

**Table 10:** Outcomes for IP SRCs classified by the modified Kirkpatrick typology

Sheu et al. (2012) compared IP attitudes and sociocultural attitudes (Level 2a) in 1st year medical, nursing and pharmacy students who did, and did not, participate in an IP SRC. Using the RIPLS and the Sociocultural Attitudes in Medicine Inventory (SAMI) they found no changes in RIPLS or SAMI items for those who participated in an IP SRC. Initial student scores were high and it is worth noting that the ceiling effect of the RIPLS is well documented (Nørgaard et al. 2016). The authors suggest that the SRC experiences may not have been frequent enough to result in attitude change. Despite this finding over half of the students self-reported improved IP attitudes.

Two studies (Kent and Keating 2013; Lawrence et al. 2015) used questionnaires to examine patient satisfaction of care within an IP SRC. Kent and Keating (2013) reported on an IP SRC for older people following discharge from an acute care hospital in Australia. This involved student teams from nursing, medicine, occupational therapy, physical therapy and social work who used a standard screening tool to identify factors impacting patient independence and health. Patients reported the programme was well received and described the students as having provided them with useful self-management information.

Using a non-equivalent groups post-intervention only study design Lawrence et al. (2015) compared patient satisfaction in a US IP SRC to that in a traditional primary care (non-IP not student-run) clinic. Patients reported high levels of satisfaction with the care team with no

difference in satisfaction levels reported between the two clinics. However, IP SRC patients reported less satisfaction with their access to care and perceived the privacy of their protected health information as less secure in the IP SRC than in the more traditional clinic setting.

#### 2.4.8.2. Qualitative interview studies

Guirguis and Sidhu (2011) reported on a qualitative study addressing pharmacy student and preceptor experiences of a Canadian IP SRC. Interviews with students and preceptors identified three main themes, dynamic team roles, interprofessional role understanding and personal benefits. Dynamic team roles concerned varied levels of student participation in the team depending on the students knowledge and experience level and the degree of IP role modelling by the supervising physician, interprofessional role understanding was thought to develop through exposure to different professions, and personal benefits arose as the students learnt about their own professional role and gained new perspective on the population served by the clinic.

Wee et al. (2011) reported the outcomes of their IP SRC (Singapore, Neighbourhood Health Screening) focussed on chronic disease management. They conducted 355 patient interviews using a standardized list of yes / no response questions administered over a 3year period. Patient satisfaction with the service provided was high (83%). Over a one-year period, the percentage of individuals receiving treatment for hypertension rose from 63% – 93% and blood pressure (BP) control improved from 42%-79%. For those newly diagnosed with hypertension, 49% were reported as having their BP under control.

Sheu et al. (2013) used in-depth semi-structured interviews with students and faculty mentors to explore the types and context of systems based practice activities students experience when working in an SRC. They identified six major domains; interprofessional roles and collaboration, clinic organization, patient factors affecting access to care, awareness of the larger healthcare system and continuity of care, resource acquisition, and allocation, and systems improvement.

An interesting finding from Sheu et al. (2013) was how students who served as clinic coordinators, with responsibility for managing the clinic, showed better understanding regarding system-based practice issues than students who were only involved in providing patient care. They suggest that the IP SRC is a suitable environment for students to learn about systems-based practice.

#### 2.4.8.3. Cohort studies

In the US Seif et al.'s (2014) prospective cohort study, used experimental and control groups and a pre-post test design to compare students who participated in an IP course plus an IP SRC, to students who had only experienced the IP SRC, and those who had experienced neither. They hypothesised that students who participated in the IP course and

worked at the IP SRC would demonstrate significant increases in their perceptions and attitudes for working in IP healthcare teams (Level 2a) and clinical reasoning skills (Level 2b), compared to students who did not participate. They applied the following assessment tools Interdisciplinary Education Perception Scale (IEPS), RIPLS, and Self-assessment of Clinical Reflection and Reasoning (SACRR). Students who completed the course demonstrated improvements in IP perceptions and attitudes and perceptions of clinical reasoning skills compared to those in the control groups.

Sick et al. (2014) reported the results of a US prospective observational cohort study addressing IP attitudes and skills (communication, teamwork, attitudes to IP learning, relationships and interactions - Kirkpatrick levels 2a and 2b) in students who participated in an IP SRC compared to those who applied to participate and were not accepted, and those who never applied. They found decreased IP attitudes and skills for all groups after the first year. They suggest this decline is due to students confronting the reality of patients' complex issues, which seem outside the capabilities of the team to resolve. In the next 2 years, they reported higher IP attitudes for those who participated in the IP SRC compared to the other groups, with those who were not accepted becoming similar to those who never applied. As discussed previously, they suggest participation may have a protective effect against declining IP attitudes and skills and suggested contact theory as a potential explanation for the development of this effect. Specific items reported to be higher in IP SRC participants included increased comfort in presenting care plans to supervisors and senior students and working in a group, improved communication skills with patients, peers and other professionals, strengthened confidence and comfort in relationships with peers and other professions, and improved patient care.

#### 2.4.8.4. Mixed methods studies

Ambrose et al. (2015) conducted a quality improvement review of an IP SRC in Canada. Using retrospective data analysis and questionnaires addressing the questions of who participates and what do they learn. Although both students and faculty supervisors reported high levels of satisfaction with the experience, issues with student retention were highlighted with the majority of students reported as attending only one shift in the clinic, and with limited diversity in the professions represented in both the students and faculty.

#### 2.4.8.5. Cost analysis studies

Haines et al. (2014) compared the cost of the Australian IP clinical experience described by Kent and Keating (2013) to a traditional hospital clinical placement (Level 4a). They identified the IP SRC as the more expensive option but suggested that if better patient outcomes were indeed achieved through such IP collaboration (e.g. fewer readmissions) this might offset the additional cost.

## 2.5 Chapter summary

This chapter has reviewed the literature on interprofessional education, medical student-run clinics, and interprofessional student-run clinics. A large volume of literature is available with regards to IPE, however, its focus is predominantly on outcomes with limited attention on process or theory. Having identified many issues that arise when conducting systematic reviews of IPE this chapter identified the need for new approaches if we are to increase understanding of if, and how, interprofessional education works.

While literature spanning several decades is available with respect to medical SRCs, the research literature for interprofessional SRCs is limited in both volume and scope. There is little understanding of how the interprofessional aspects of these clinics work, with the majority of the literature lacking information regarding outcomes and the available literature tending towards the use of self-reported student outcomes. The literature fails to address the processes at work within these clinics and no papers were located that used theory in the design or delivery of their interprofessional SRC. This is a significant gap in the literature. Despite being promoted as locations providing valuable opportunities for clinical IPE there is very limited understanding of how interprofessional SRCs may work. This thesis adopts a new approach to developing programme theory, realist evaluation, to gain insight into how an interprofessional SRC works. Addressing the realist questions of what works, for whom, under which circumstances, in what respects, and why? The following chapter presents the methodology and methods that were adopted to address the following study research questions.

### 2.5.1 Research questions

For interprofessional education for healthcare professional students in a student-run interprofessional clinic:

#### **Implementation theory**

1. How did the programme designers expect it to work?
  - 1a. What are the expected outcomes for the clinic?

#### **Programme Theory**

2. How did the clinic play out in practice? What worked, for whom, in which circumstances, in what respects, and why?

2a. Explaining the pattern of outcomes (For whom? In what respects?)

What were the outcomes of the interprofessional student-run clinic?

What were the outcome patterns for its participants?

2b. Identifying the mechanisms of change (What is it that works and why?)

What are the underlying causal mechanisms at play within the clinic?

How are these mechanisms triggered to bring about change?

2c. Understanding the context (For whom? In which circumstances?)

How do pre-existing contextual conditions influence outcomes?

How do they enabling or disable the intended mechanisms of change?

2d. Developing context-mechanism-outcome configuration theories (What works, for whom, in what circumstances, in what respects, and why?)  
What are the context-mechanism-outcome configurations that seek to explain what happens to participants of an interprofessional student-run clinic?



# Chapter 3: Methodology and Methods

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## Introduction

This chapter outlines the theoretical approach adopted in addressing the research questions. It discusses the ontological, epistemological, and methodological stances that are foundational to this study, and describes the selected research methods and the rationale behind their selection. It also details strategies adopted to enhance the trustworthiness of the study and describes ethical considerations that arose and how these were addressed.

### 3.1. Ontological, epistemological, and methodological stance

In considering how best to fulfil the aims of this study it was essential to determine the philosophical paradigm upon which the study is founded. A paradigm is

“A set of interrelated assumptions about the social world which provides a philosophical and conceptual framework for the organized study of that world” (Filstead 1979, p.34).

An appropriate paradigm describes the underlying philosophical assumptions of the study and guides the selection of tools, instruments, participants, and methods (Denzin and Lincoln 2000). Paradigms are characterized by their ontology (what is reality?), epistemology (how do you know something?), and methodology (how do you go about finding out?). Together these provide a holistic view of how we view knowledge, how we see ourselves in relation to this knowledge, and the methodological strategies we use to uncover or discover it (Guba 1990).

#### 3.1.1. Ontological stance (what is reality?)

This study aims to uncover the programme theories for an IP SRC to add to our understanding of this growing, but poorly illuminated area of IPE. In chapter 2 it was suggested that a positivist ontological perspective with its view of a linear causation and reliance on randomized controlled trials and systematic reviews, has shown a limited capacity to address many core questions regarding IPE. Such approaches have struggled to tackle the complexity within IPE, which involves the social interaction of multiple players from different professions within a complex and adaptive context. It proposes the adoption of an alternative ontological perspective, empirical realism, arguing that realist ontology

opens potential new ways of knowing and discovering that embrace such complexity that can add to our knowledge and understanding of IPE and IP SRCs.

Realism is a logic of inquiry positioned midway between empiricism and constructivism (Whitbeck & Bhaskar 2008; Collier 1994; Pawson 2006) believing in the independent existence of both the natural and the social worlds (Bhaskar 2008; Archer 1995; Pawson and Tilley 1997). The social world is held to contain both natural and social objects and structures, determined to be 'real' with respect to the effects they produce. In realist thinking, causation is thought to be generative in nature. Social and natural objects are proposed to possess causal powers or 'mechanisms', capable of generating change (Archer 1995). An important feature of such causal mechanisms is the effects they produce are regarded as being contextually dependent (Westhorp 2008). To this end, aspects of context can impact programme outcomes, through their influence on generative causal mechanisms producing a varied pattern of programme outcomes. As with other post-positivist approaches it holds to the belief in an objective reality that is only imperfectly understood (Lincoln and Guba 2000).

Adoption of realist ontology to uncover the programme theory of an IP SRC necessitates the identification of these underlying causal mechanisms, the contextual factors impacting upon them and the consequent outcomes of such interactions. The assumption is that there are real identifiable mechanisms and contextual factors to uncover. It is also expected that the IP SRC will produce a varied pattern of outcomes.

### 3.1.2. Epistemology (how do you know something?)

#### **Critical realism and empirical realism**

Two branches of realist thought have emerged divided over the contentious issue of the 'open-system' nature of social explanation (Pawson 2013). Realists see social systems as highly complex, the product of endless components impacted by numerous forces (e.g. historical, political, institutional), and behavioural patterns that are prone to change through the volitions of individuals and the choices they make. As such, social life is complex and in constant flux, creating a significant predicament when trying to explain it. Critical realism presumes that in such an open system a myriad of explanatory possibilities exists, some true and some incorrect, the primary goal of social inquiry being to *critique* the thoughts and actions responsible for such false explanations (Archer 1995; Bhaskar 2008). The focus of critical realism, as articulated by Archer and Bhaskar, is therefore, theory falsification.

Other realists such as Pawson (1989) and Williams (2000) have adopted an alternative realist stance, this school of thought believes in the value of adjudicating *between* alternative explanations rather than eliminating false explanations, acknowledging the open

system nature of social inquiry, and recognizing that other possible explanations may exist. This branch of realist inquiry, referred to as scientific, empirical, emergent, middle-range, or analytical realism, adopts many of the components of empirical science. It is characterised by the development of hypotheses that articulate the relationships between generative causal mechanisms and contextual components, and the empirical testing of such hypothesis. It holds that our knowledge of the world can only ever be partial and is always contextual. It involves the construction of theory or theories of causal explanation that are framed around the notion of generative mechanisms that explain the connection between social programmes and their outcomes.

This approach embraces the innate complexity of social programmes and rather than attempting to exert control, examines programmes in situ, seeking out the pattern of outcomes that programmes produce, and identifying those elements of the context that interact to produce such a pattern of outcomes. As such its focus is on specificity rather than generalizability. Irregularities are embraced and prompt the search for contextual elements that morph the programme outcomes for individuals and groups. This approach is argued to be capable of providing an in-depth and theory-driven understanding of a programme such as this IP SRC. It is this realist perspective as articulated by Pawson and Tilley (1997), and hereto referred to as empirical realism, that has been adopted in this study.

### 3.1.3 Realist evaluation

Realist evaluation is a form of theory-based evaluation that acknowledges the inherent complexity of social interventions and focuses on identifying the underlying programme theory or theories which are subsequently evaluated in the reality of programme delivery (Chen 1994; Rodgers 2007). Such evaluations address the questions of what works, for whom, in what circumstances, in what respects, and why?

Theory-based evaluations are characterised by their use of an explicit “theory of change” to evaluate if and how an intervention may have contributed to the observed results. They can be distinguished from more traditional evaluative approaches by their explicit focus on the context of interventions and how such contextual factors influence outcomes, and by their mechanistic approach to determining causality. Theory-based evaluation has become mainstream over the last two decades, providing significant programme information including how programmes are designed, delivered, and how they impact the programme participants (Chen 1994). The strength of such an approach is that it recognizes and embraces programme complexity addressing many of the issues, that arise when using traditional experimental approaches to evaluate complex interventions (Treasury Board of Canada Secretariat 2012).

The subject or intervention of interest of a realist evaluation is a social programme or programmes, which are considered to consist of complex social interactions between individuals and organizations.

“Social interventions are complex systems thrust amidst complex systems. Attempts to measure ‘whether they work’ using the conventional armoury of the systematic reviewer will always end up with the homogenised answer ‘to some extent’ and ‘sometimes’ but this is of little use to policy makers or practitioners because it provides no clue as to why the interventions sometimes work and sometimes don’t, or in what circumstances or conditions they are more or less likely to work, or what can be done to maximize their chances of success and minimize the risk of failure” (Pawson et al. 2005, p.iv).

Reflecting on the issues the limited capacity of systematic reviews to add to our knowledge regarding the impact of IPE and IPCP (presented in chapter 2), the issues raised by Pawson et al. (2005) appear to mirror the difficulties encountered by systematic reviewers who attempt to examine the impact of IPE and IPCP. The traditional positivist approach has shown a limited capacity to increase understanding of if and how IPE works for pre-qualification healthcare professional students, with few studies meeting the systematic review inclusion criteria, and significant heterogeneity in study design and assessment. Due to their ontological and epistemological stance, such approaches struggle to accommodate the complexity of the social interactions that are innate to IPE.

#### 3.1.4. IPE as a complex social interaction

IPE programmes are by their nature complex involving a variety of health and social care professions each with their own unique professional identity and culture involving students at different stages in their professional development. As previously discussed programmes vary in purpose, teaching and learning methods, settings, competencies addressed, and outcomes of interest (Cooper et al. 2004). Clinical IPE programmes are typically developed by educational institutions but are delivered in clinical settings necessitating considerable collaboration between the health and educational systems, both of which are subject to frequent organizational and operational change (Baldwin 2007).

The complex nature of IPE has been discussed by many authors (D’Amour and Oandasan 2005; Reeves et al. 2011; Hammick et al. 2007; Barr et al. 2002) who call for new approaches to describing and evaluating IPE. This study proposes realist evaluation as such an approach, as it is particularly adept at examining complex programmes occurring in contexts that are subject to change. Realist evaluation embraces the complex nature of social interactions and the complexity of social reality and may provide a window through which to view and understand how IPE works. Table 11 presents the characteristics of

complex social interactions identified by Pawson and Tilley (1997) and how such characteristics are present in IPE programmes.

Characteristics of Interprofessional Education Programmes	Characteristics of a complex social interactions
<p>Interprofessional education programmes are shaped by an underlying programme theory or theories but such theories are rarely explicitly articulated.</p> <p>Interprofessional education programmes involve the social interactions of healthcare students and providers from a wide variety of professions, each with their own unique professional culture, coming together with patients and their family members. Understanding their intentions, motivations, and reasoning is essential to understanding the programme.</p> <p>Interprofessional education programmes consist of a chain of steps or processes. These chains or steps are often not linear and involve negotiation and feedback between students, faculty mentors, patients and family members.</p> <p>Interprofessional education programmes involve complex social interactions occurring within the complex social environment of health care delivery. The success of the programmes is shaped by this context.</p> <p>Interprofessional education programmes are prone to modification as they are implemented.</p> <p>Interprofessional education programmes change and adapt through learning as those who design and deliver them come to understand them.</p>	The intervention is a theory or theories (implicit and rarely stated rationale).
	The intervention involves the actions of people – so understanding human intentions and motivations, what stakeholders know and how they reason, is essential to understanding the intervention.
	The intervention consists of a chain of steps or processes
	These chains of steps or processes are often not linear and involve negotiation and feedback at each stage.
	Interventions are embedded in social systems and how they work is shaped by this context (the process of adaptation and local embedding is an inherent and necessary characteristic).
	Interventions are prone to modification as they are implemented
	Interventions are open systems and change through learning as stakeholders come to understand them.

**Table 11:** Characteristics of complex social Interactions and their representation in IPE

### 3.1.5. Realist evaluation and theory

Realists have a unique way of understanding the constituents of theory. Theories are framed in terms of propositions about how mechanisms are fired in contexts to produce outcomes.

"Programmes are broken down to identify what it is about the measure which might produce change, which individuals, subgroups, and locations might benefit most readily from the programme, and which social and cultural resources are necessary to sustain the changes" (Pawson & Tilley 1997, p.85).

Realists hold that programmes are theory incarnate and realist evaluation involves the processes of developing, refining, and testing such programme theory. It stresses three key linked concepts for explaining and understanding how programmes work, mechanisms, contexts, and outcome patterns, which are used to formulate context-mechanism-outcome (CMO) pattern configurations or CMO theories. This thesis argues that this approach may help articulate the underlying theory at play in an interprofessional SRC with the potential to provide insight into this area of practice, which to date has received little attention.

### 3.1.5.1. Mechanisms

“This realist concept tries to break the lazy linguistic habit of basing evaluation on the question of whether ‘programmes work’. In fact, it is not programmes that work but the resources they offer to enable their subjects to make them work. This process of how subjects interpret and act upon the intervention stratagem is known as the programme ‘mechanism’ and it is the pivot around which realist research revolves” (Pawson and Tilley 2004, p.6).

Mechanisms describe what it is about the programme that makes things happen. An IPE programme may work in very different ways by triggering different mechanisms, for example, a case based IPE activity where students from different professions come together to develop a plan of care for an individual may aid in the development of collaborative behaviours (outcome) by exposing students to the range of client needs (resources), leading them to reason that these needs cannot be met by a single profession (reasoning). Gaining knowledge of the unique contributions that other professions can bring to that individual's care (resource), might make a student realise that they need to ask others to contribute to care (reasoning), and may change their behaviour in seeking out and collaborating with other professions (outcome).

Mechanisms explain both a programme's successes and failures, for example, if the group structure and introductions are not carefully designed (context), exposure may act as an opportunity to reinforce professional stereotypes held by students (reasoning) and lead them to not engage with other professions or to have negative interactions with them (outcome). If students are not at similar points in their professional development and cannot equally articulate their own profession's role (context) it may confuse students as to the roles and responsibilities of other professions (reasoning) and lead to them not to seek the input of other professions (outcome). So mechanisms are the process through which programme resources and participant reasoning interact to produce change (outcomes). Mechanisms, therefore, relate to the reasoning or choices of programme participants (Dalkin et al 2015; Dalkin et al 2016). Mechanisms are understood as being a combination of the resources offered by an intervention (mechanism resource) and the reasoning this produces (mechanism reasoning) within a particular context (Dalkin et al. 2015). This alters the behaviour of participants leading to measurable or observable outcomes (Dalkin et al. 2016, p.691).

### 3.1.5.2. Contexts

Many mechanisms may be at play in a programme, being activated, or not depending on the context. Realist approaches suggest this interplay of mechanisms and contexts is the process by which programmes generate varied patterns of outcomes, for different participants, or when attempts are made to replicate a successful programme at a different setting, at the same setting at a different time, or with different groups of participants. It is assumed that mechanisms are only triggered if the conditions, or context is right. The contextual component allows for the investigation of ‘for whom’ a programme might work and ‘in what circumstances”, examining contexts that are supportive to or may hinder a programme in achieving the desired outcomes. Pawson and Tilley (1997) suggest that an understanding of context includes the characteristics of the individual players, their interrelationships, the institutional location and the surrounding infrastructure.

### 3.1.5.3. Outcomes

Empirical realists propose that if we are to identify causal connections in complex social programmes we must attempt to understand outcome patterns as opposed to searching for single outcomes (Pawson and Tilley 1997; Dalkin et al 2015; Dalkin et al 2016). One must be prepared to consider the variety of outcomes achieved by a programme including those that were expected and those that were not. Pawson (2006) argues that it is the total pattern of outcomes that are valuable to understanding what works, for whom, under what circumstances? A varied pattern of outcomes is thought to develop through the interaction of mechanisms and contextual elements. This study aims to identify programme theory by uncovering the pattern of outcomes for an IP SRC and identifying associated contexts and mechanisms that shape these outcomes for the various clinic participants.

### 3.1.5.4. Theory building in realist evaluation – CMO theories

The UK Medical Research Council (2000) recommends that in the development and evaluation of complex interventions, an essential first step is the development of a theoretical understanding of the likely processes of change. This involves the use of existing explicit theory, which may have been considered by those who commissioned the programme, or the programme designers, but may have been lost in translation or modified as the programme was put into practice. Therefore such theory is supplemented by primary research usually through interviews with those involved in the development and delivery of the programme and those individuals who are targeted by a programme, incorporating their implicit theory and practice theory. Pawson and Tilley (1997) describe this process as engaging in theory formation, through the development of CMO theories. As mechanisms are held to be real, repeated programme evaluation in differing contexts, may result in the development of middle-range theories concerning what works, for whom, in what circumstance and why?



As previously stated, a realist perspective suggests that the same programme can produce different outcomes by triggering different mechanisms in different participants and that the triggering of such causal mechanisms is contextually dependent (Pawson and Tilley 1997). In its most simplistic form this relationship is represented as:

$$\text{Outcome} = \text{Mechanisms} + \text{Contexts}.$$

Westthorp (2008) suggests that a particular contribution of the work of Pawson and Tilley (1997) is this generative explanation of the relationship of mechanisms to the reasoning of programme participants and thus outcomes. Programmes provide resources to participants that impact upon their reasoning and the choices they make. By articulating the interrelationships between resources and reasoning hypotheses can be generated about how programmes work (Pawson and Tilley 1997). This is how programme theory is developed. Such programme theory is articulated as context-mechanism-outcome configurations or CMO theories. A programme theory specifies the underlying assumptions about how an intervention is supposed to work. Dalkin et al. (2015) separated the two components of mechanisms, into mechanism resources and mechanism reasoning, and present CMO theories as:

$$\text{Mechanism Resource} + \text{Context} \rightarrow \text{Mechanism Reasoning} = \text{Outcome}$$

This formula has been used in developing and presenting the CMO theories within this study.

### 3.1.6. Methodology (how do you go about finding out?)

Guba and Lincoln (1994) describe methodology in terms of how the would-be knower can go about finding whatever it is that he or she thinks can be known. Realist evaluation is used as a theoretical framework for this study and as a methodological perspective. As such it has guided the development of the research questions, and the selection of methods. Whereas traditional approaches focus on the question: does it work, realist evaluation seeks to explain what works, for whom, in what circumstances, in which respects, and why? These questions are addressed through the identification of underlying causal mechanisms; contextual factors that impact upon such mechanisms, and the consequent outcomes of such context-mechanism interactions. The assumption is that there are real identifiable mechanisms and contextual factors to uncover.

This study aims to identify the theoretical underpinning of an IP SRC. The programme theory will be identified through the construction of realist context-mechanism-outcome configurations (hypotheses) that make sense of the ways in which actions taken in the context of the clinic, trigger various mechanisms and generate a pattern of outcomes for its various participants.

The research questions are realist in nature addressing what works, for whom, in what circumstances, in which respects, and why? To illuminate and articulate the programme



theory, the study questions are focussed on the identification of the context-mechanism-outcome configurations at play within the IP SRC.

## 3.2. Study methods

In considering the selection of an appropriate methodology and methods to answer the study questions, several key issues have been addressed. With regards to methodological choices, these issues relate to where, or with whom the desired knowledge resides, and with regards to methods, how that information can be appropriately sourced, collected, and analysed.

This study aims to uncover the programme theory for an IP SRC. Pawson and Tilley (1997) describe programmes as theory incarnate and suggest that the implementation of such programmes follows a theoretical implementation chain. They posit, that programmes begin in the minds of those individuals who originate the idea, who start with an initial theory of what the programme is intended to achieve, and how the programme might operate to produce such change. However, as the programme passes from the hands of those who conceived it, to those who deliver it, those who further develop it, and those who experience it, programmes evolve and change, as does the programme theory or theories. As such programmes undergo significant adaptation during their implementation, and therefore in evaluating how a programme works it is important to ascertain both how it was intended to work, and how it actually played out in practice.

With regards to the IP SRC being examined in this study, it is argued that knowledge of the implementation chain and the underlying theory or theories at work, may be held in the minds of those who designed the clinic who may have knowledge of how it was intended to work. Those who delivered, developed, or experienced the clinic may hold valuable knowledge of how it works in practice. There may also be artefacts, in the form of documents that may describe the design, development, and implementation. To access such knowledge, a qualitative approach was selected for this study.

### 3.2.1. Rationale for a qualitative approach

The role of qualitative methods in seeking and providing an explanation for complex phenomenon has been well established, and an evaluative qualitative approach has played an important role in the generation of explanatory hypotheses, (Lofland and Lofland 1995; Miles and Huberman 1994). Qualitative methods are particularly adept at looking at how things operate and can help to identify the processes and consequences that lead to different outcomes (Ritchie and Lewis 2003). Snape and Spencer, (in Ritchie & Lewis, 2003) suggested this approach is particularly useful when one is attempting to:

“Identify the factors that contribute to the success or unsuccessful delivery of a programme, service or intervention; when one wishes to identify the effects of taking part in a programme or initiative on participants, and how they occur; when examining the nature of the requirements of different groups within the target population; when exploring a range of organizational aspects surrounding the delivery of a programme, service or intervention; and when exploring the contexts in which interventions are received and their impact on effectiveness “(Snape and Spencer 2003, p.17).

These closely resemble the intents of this study and would suggest that this is an appropriate approach to addressing the study questions.

One of the central features of the qualitative approach is the focus on how individuals in a particular context "understand and interpret their social reality" (Bryman 1988, p.8). The focus is on making sense of or interpreting phenomena in terms of the meanings that people bring to them. Hammersley (1992) suggests that the social world exists independent of an individual's subjective understanding, however, in trying to gain an understanding of that social world, the only route open to us is through the various interpretations that individuals bring. Their different vantage points yield different types of understanding. Hammersley highlights the diverse and multifaceted nature of external reality and suggests that diversity brings richness to understanding the various ways in which reality is experienced. The aim of a qualitative approach is, therefore, to produce as full a picture as possible of the nature of the programme.

Qualitative research involves the study of phenomenon within their natural setting, and as such, this approach is contextually grounded. As context is a critical feature of a realist evaluation approach to uncovering programme theory, appreciation of the natural setting is therefore vitally important to this study. Creswell (1998) suggests that qualitative enquiry is amicably suited to the exploration of a phenomenon in its naturalistic setting and offers the potential for an in-depth enquiry. Both of these strengths of a qualitative approach are integral to addressing the study research questions.

### 3.2.2. Rationale for a single case design

An explanatory single case study design was adopted for this study. Yin (2003) proposes that such an approach is particularly useful when the research questions seek to explain causal links in real-life interventions that are too complex for survey or experimental approaches. This approach attempts to explain the linkage or linkages between the programme intervention and its outcomes. A qualitative case study examines a phenomenon within its real-life context (Yin, 1994) and can be a suitable approach for studying complex social phenomena.

The use of a single case design afforded the opportunity for in-depth exploration of the clinic and the generation of diverse accounts from those who designed, developed, delivered, and participated in it. Such an approach allowed for thorough exploration of the IP SRC and explanation of the factors that shaped its outcomes across different participants and under the influence of different contexts. Using varied data sources and addressing the many players involved in the programme helped ensure the clinic was explored through multiple lenses and assisted in uncovering the many and varied facets of the clinic, a key feature of case study research.

### 3.3. Design of the inquiry

#### 3.3.1. Case site selection

Criterion sampling was used to identify universities in the US that operate IP SRCs from conference proceedings and abstracts from two major IP conferences. These conferences were selected, as they are the major locations for the dissemination of IPE activity and research in the US. Three potential sites were identified that met the inclusion and exclusion criteria outlined in Table 12. At one site the clinic was undergoing a refurbishment and therefore the SRC was not currently functioning, one did not respond, and one confirmed they were willing and able to participate. This clinic was situated almost 2,000 miles from the university where the researcher was based and was not affiliated with that university.

Inclusion Criterion	Exclusion Criteria
The clinic is an SRC clinic	The clinic, not an SRC
The clinic is an IP SRC The programme meets the definition of IPE: * It involves students from 2 or more healthcare professions. * Students engage in active learning and are provided with the opportunity to learn from, about and with each other.	The clinic is not an IP SRC and does not meet the definition of IPE: *Involves a single profession *Multiple professions engaged in side by side learning activities (multi-professional)
The target audience is pre-qualification health professional students.	The targeted audience is post-professional registered/licensed healthcare professionals

**Table 12:** Site inclusion and exclusion criteria

#### 3.3.2. Data collection

Data collection involved semi-structured interviews with 25 key stakeholders within the IP SRC and collection of programme documentation identified and retrieved prior to the first site visit and throughout the data collection phase. The study data sources are presented in Table 13.

Data	Type of Data	Source
Primary Data	In-depth semi-structured Interviews. <ul style="list-style-type: none"> <li>• Interview transcripts</li> <li>• Researcher interview notes</li> </ul>	25 participants: <ul style="list-style-type: none"> <li>• 10 Faculty clinicians (involved in the design or delivery of the SRC)</li> <li>• 10 Student leaders (involved in the design or delivery of or participating as volunteers in the SRC)</li> <li>• 5 Student volunteers (participants)</li> </ul>
Secondary Data	Programme documentation.	<ul style="list-style-type: none"> <li>• Minutes of 44 Executive Board meetings covering the time from the clinic's inception in 2013 through to the period of the study data collection</li> <li>• Documentation in the form of PDF copies of PowerPoint slides from 8 student leadership presentations about the clinic</li> <li>• A copy of the Clinic Mandatory Student Training Materials.</li> <li>• All issues of the Interprofessional Student-run Clinic Quarterly Newsletters (3 issues)</li> <li>• Specialty Clinic policy documents (4 documents from the Physical Therapy Clinic)</li> <li>• 3 University fliers that describing the interprofessional activities at the university including the interprofessional student-run clinic.</li> </ul>

**Table 13:** Study data sources

### 3.3.2.1. Interview participant recruitment and selection

Coles and Grants (1985) describe an educational curriculum as having three personas, the curriculum on paper, curriculum in action and the curriculum as experienced by students. This description aligns with the previously described realist notion of the implementation chain.

The curriculum on paper concerns what is written about the programme in the documentation, (syllabi, course descriptors, course developer notes etc.), and what is said about the programme by people regarding its purpose, aims, goals, and intentions of those involved. It could be argued that the implementation theory may be articulated in the curriculum on paper. The curriculum in action represents how the intentions of the curriculum come to life in the reality of practice, which is influenced by the perceptions of those who deliver it. The students' experience of the curriculum involves what students do, how they engage with the programme, what they believe they should be doing, the learning that occurs, and its outcomes.

In attempting to develop the programme theory for the IP SRC it was imperative to include the perspectives of individuals engaged throughout the implementation chain who's actions shaped the clinic. Purposive sampling was used to select participants who were both

knowledgeable about the clinic, and could provide a range of different perspectives (Rubin and Rubin 1995) including students and faculty clinicians who designed, delivered, and participated in the clinic who were thought to provide unique insights into the clinic.

The site gatekeeper disseminated an email to the clinic designers, deliverers and participants (faculty and students) regarding the study purpose and requesting volunteers. Interested parties responded to the researcher who contacted each potential subject by phone and /or e-mail depending on the subjects' preference. Subjects were provided with a study information sheet and informed consent for review (Appendix 4). If they choose to participate the information sheet and informed consent were reviewed and signed immediately prior to conducting the interview. This process allowed potential participants appropriate time (1-week minimum) to review the purpose of the study and the exact nature of their participation prior to giving informed consent. Twenty-five individuals were selected and provided consent including ten faculty clinicians, ten student leaders, and five student volunteers. As the programme was IP in nature attempts were made to ensure representation of each of the professions within the clinic.

#### 3.3.2.2. Document retrieval

The site gatekeeper and all study participants were requested to identify any documents that may help address the study questions. They were asked about documents that might describe the IP student-run clinic, its origins, structure, and development or any materials that may contain descriptions of what the IP clinic was, or is, expected to achieve, its outcomes or impact, its theoretical underpinning, problems that may have impacted its success, and any strategies that were adopted to address these problems. The documents elicited from this request are presented in table 13.

#### 3.3.2.3. Developing and conducting realist semi-structured Interviews

Qualitative interviewing has been identified as the most commonly used data collection method within realist evaluations (Marchal et al. 2012; Manzano 2016). While many authors have debated how qualitative interviews should be conducted (Guba 1990; Denzin and Lincoln 2000) few have addressed the specific approaches and strategies that may be appropriate for realist qualitative interviews. A review of the data collection methods employed in realist evaluations of health-related programmes (Manzano 2016) found most authors used traditional semi-structured interview approaches and few provided descriptions of how realism was infused into the design and conduct of the interviews or within the data analysis process and failed to sufficiently demonstrate how the data was collected with a specific focus on incorporating realist ontology. Realist qualitative interviews are used for causal and explanatory purposes to identify, explore, and refine propositions or theories about how programmes work (Pawson and Tilley 1997; Manzano 2016). The data from realist interviews are considered to be “evidence of real phenomena and processes” (Maxwell 2012, p.103) rather than constructions. Pawson and Tilly (1997) suggest realist

ontology necessitates the adoption of different approaches to interviewing than for constructivist interviews. The following sections identify how realist philosophy and principles were applied in planning and conducting the interviews and in data analysis. It identifies how the application of this philosophical stance has shaped the conduct of data retrieval providing a description of how realist philosophy was used in the selection of participants, development, and design of the study interview guides, and conduct of the interviews and how realist principles shaped the approach to data analysis.

#### *3.3.2.3.1. Interview process*

Interviewees participated in a semi-structured interview during which they were asked to answer questions about their experience in the IP SRC. Semi-structured interviews were selected as this approach provided consistency in topics addressed across participants while permitting latitude for probing additional emergent topic areas (Berg 2001; Doody and Noonan 2013). May (1993) suggests such probing allows for clarification and elaboration of the participant's responses and can lead to greater depth of exploration of the topic. The interviews were approximately 45 minutes in duration and were audio recorded. To protect the confidentiality and anonymity of study participants all audio files were saved using pseudonyms at the time of audio recording. Transcripts were produced using only the pseudonym. Audio and transcript files were password protected and stored on a password-protected computer with hard copies stored in a locked file cabinet.

The social context for the interviews was an important consideration as this may impact the relationship between the researcher and the interviewee (Doody and Noonan 2013). Holloway and Wheeler (2010) suggest efforts should be taken to secure a time and place convenient to the participant, in a neutral, comfortable, safe location with limited potential for interruptions. The interviews with students were conducted in an office at the study site that was loaned to the researcher for the duration of the study. This office was located in an IP area away from the students' programme areas. The majority of interviews occurred in the late afternoon or evening to accommodate the students' class schedule and faculty interviews were conducted during regular working hours in this location or in their office, depending upon their preference.

#### *3.3.2.3.2. Interview guide*

An interview guide was developed to create a sense of order and ensure all participants were asked questions addressing similar topic areas (David and Sutton 2004; Holloway and Wheeler 2010). The interview guide is presented in Appendix 5. Care was taken in the construction of the interview guide to ensure the research questions were adequately addressed, and the interview process maximized the opportunity for the development of rapport between the researcher and the interviewee. Such rapport involves trusting and respecting the interviewee and the information they share and can help create a supportive environment in which the interviewee can share their thoughts and experiences. A cadre of authors identified stages of rapport building including apprehension, exploration,

cooperation, and participation (Spradley 1979; Briggs 1986; Miller and Crabtree 1999; Rubin and Rubin 2005). The interview guide was constructed to allow for the natural and connected progression through the research questions whilst simultaneously incorporating interview strategies that support the building of rapport (DiCicco-Bloom and Crabtree 2006; Moser and Kalton 1979). The apprehension phase included the preparation of the interviewee and the initial questions. The time taken in discussing and obtaining informed consent and preparing the interviewee was used to develop rapport and give time to accommodate to being recorded. Careful attention was given to the phrasing of the initial question, which was focussed, open-ended and addressed a non-sensitive topic that the interviewee was very familiar with, describing the clinic and their part in it. During the exploration phase the outcomes and purpose of the clinic were explored using open-ended questions and probing as the interviewee became increasingly engaged and the conversation more in-depth. As their comfort level increased through the co-operation phase the more complex topics were introduced, and through the participatory phase, the interviewee was asked to guide the interviewer through their ideas on how the clinic worked for different participants.

When framing realist questions Westhorpe (2008) suggests some general strategies to assist in identifying contexts mechanisms and outcomes. Contexts may be identified by narrative questions that ask participants to recount stories or examples of when they have seen the programme be particularly effective or ineffective and for whom that may have been the case. Prompting for more detail in the stories and using feedback by reframing the participant's explanations and providing them back to them for comment was also suggested to assist participants to engage in reflection on their comments and aid in refining theoretical propositions that developed throughout the interviews. These strategies were used throughout the interviews.

#### *3.3.2.3.3. Researcher stance in conducting the interviews*

The stance adopted by the researcher in this study was that of the teacher-learner. This is a somewhat different stance than that of the naïve actor advocated in other approaches. Pawson and Tilley (1997) described the relationship within a realist interview as the teacher-learner cycle, with the roles interchanging between the interviewer and interviewee. At times, particularly in the early stages of theory development, the interviewer learns from the interviewee as they describe the programme and their experiences. The interviewee learns from the interviewer as the interviewer conducts the on-going analysis and presents potential propositions and ideas to the interviewee. These roles are suggested to change throughout the interview process.

#### *3.3.2.3.4. Pilot interviews*

Three pilot interviews were conducted with the purpose of testing the interview guide and the data collection and analysis processes. Piloting also allowed the interviewer to prepare

and practice question delivery and probing, promoting a more natural conversational style with participants. It is argued that such preparation can lead the researcher to be more able to focus on active engagement in the interview, active listening, and responding to the interviewee's comments with appropriate probes (Smith et al. 2009).

In the pilot, interviews rapport was developed early and it was easy to get participants talking by asking them to describe the clinic and their part in it. There was a need for the significant use of probing to help interviewees go deeper. It appeared that it was easy for the interviewees to identify outcomes, both expected and unexpected, but it was necessary to this follow up with probing questions to elicit the contexts and mechanism, e.g. what they thought might be producing or causing these outcomes (mechanisms), and which contextual aspects might result in different outcomes (context)? This was necessary for uncovering the connections between contexts, mechanisms, and outcomes.

### 3.3.3. Theory development interviews

Three interview stages were employed for data collection (summarized in Table 14).

Manzano (2016) describes realist interviews as involving three phases of theory development, cautioning that these are not to be considered as distinct sequential phases but reflect a different emphasis in the interviews at different times. These are theory gleaning, theory refinement, and theory consolidation. In programmes where theory has been well developed and articulated, theory refinement and consolidation may be the starting point while in programmes lacking a clear articulation of their underlying theory or theoretical assumptions, and as discussed in Chapter 2 this is argued to be the situation for IP SRCs, theory development must begin with theory gleaning.

In conducting the realist interviews careful consideration was given to how different players in the IP SRC were able to provide different kinds of information regarding contexts, mechanisms, and outcomes (Pawson and Tilley 1997, Manzano 2016). The first set of interviews was aimed at student clinic designers, student clinic leaders and faculty clinicians who had been involved with the clinic during the design and/or early implementation phases. These individuals were thought to hold important insight to address the first study research question of how the clinic was expected to work (implementation theory). Having been with the clinic for some time this group of participants was also thought to have specific knowledge of how the clinic worked in practice (programme theory). The student leaders were tasked with problem-solving clinic issues and as such were considered to have useful insight into the impact of contexts on expected and actual outcomes. Faculty clinicians, having supported various students in the clinic, were thought to have specific knowledge regarding outcomes of different students and the contexts and mechanisms that may shape such outcomes.



	Interview Series 1	Interview Series 2	Interview Series 3
<b>Sampling</b>	Purposive	Purposive	Purposive
<b>Focus of theory development</b>	Theory gleaning	Theory gleaning and refinement	Theory refinement and consolidation
<b>Research Questions</b>	Question 1 - How did those who designed the clinic expect it to work? Question 2 - How did the clinic play out in the reality of practice?	Research Question 1 + 2	Research Question 2.
<b>Focus</b>	Uncovering the initial programme theory. Mechanisms, contexts, outcomes.	Uncovering and refining the initial programme theories	Refinement of CMO configurations.
<b>Participants</b>	Student leaders and faculty clinicians who designed and deliver the clinic.	Frontline implementers Student leaders, faculty clinicians, and student volunteers	Student leaders, faculty clinicians, and student volunteers
<b>Questions</b>	Interview guides for each type of participant.	Modified interview guide with added questions regarding evolving programme theories	Modified interview guide with added questions regarding evolving programme theories
<b>Document retrieval and analysis</b>	Pre-interview analysis of publicly available documents. Additional documents retrieved and analysed post-interview	Additional documents retrieved and content analysis performed post-interview.	Deductive coding using modified framework
<b>Process of data analysis</b>	Iterative Inductive open coding of interview transcripts and documents. Deductive - Codes categorized as contexts, outcomes, mechanism resources or mechanism reasoning.	Iterative Inductive open coding of interview transcripts and documents. Deductive - Codes categorized as contexts, mechanisms, and outcomes	Iterative Inductive open coding of interview transcripts and documents. Deductive - Codes categorized as contexts, mechanisms, and outcomes
<b>Framework development</b>	Contexts, mechanisms, and outcomes start to take shape. Ready to be presented and refined in future interviews with other stakeholders Initial Framework developed	CMOs presented throughout interview for refutation, confirmation or refinement. Framework refined based on new data	CMOs presented throughout interview for refutation, confirmation or refinement. Framework applied.

**Table 14:** Three interview stages of data collection and analysis

This first set of interviews focussed on theory gleaning which are used when little is known about the underlying theoretical components of the programme being studied and involve the interviewer learning from the interviewees, who helps the interviewer understand the programme, explore how the programme works, for whom, in what circumstances, and to begin to articulate first-order theories (Manzano 2016). The questions in this first interview set were informed by the literature review and preliminary analysis of publicly available clinic documents. The questions were exploratory in nature and started by asking the interviewees to describe the clinic including its structure and purpose. They were asked about their roles and experiences in the clinic and to tell stories about specific experiences of how the clinic worked, whom it might work for, and in what circumstances. Analysis of these interviews helped build tentative explanations that could be carried forward to the next round of interviews and document analysis.

The second interview set focussed on theory gleaning and theory refinement, which involved incorporating insights gained from the initial interviews into the interviewers thinking (Manzano 2016). At the end of each interview the fledgling theories, which were developed from analysis of the first interview set, were shared with interviewees. They were provided with the opportunity to consider, confirm, refute, or modify them, supporting the refinement of the programme theories. The third interview set also focused on theory refinement but additionally attempted to address theory consolidation through fine-tuning of the emergent programme theories (Manzano 2016).

### 3.3.4. Data analysis

The following section outlines the data analysis approach adopted in this study, summarised in table 13. For the purpose of clarity, this is presented as a separate section, however, the process of data analysis was intertwined with data collection as the researcher integrated findings of early data analysis into later data collection.

The data analysis process involved open coding of interview transcripts and documents, codes were then reviewed and similar conceptual codes were combined to form categories e.g. the codes of, on the same level, equal footing, and a level playing field were combined to form the category of equal status. These categories were then examined within the original text and were classified as representing mechanism resources, outcomes, contexts or mechanism reasoning. Framework analysis was used to support this deductive categorisation phase.

The search for connections between outcomes, contexts, and mechanisms commenced with examining the identified outcomes. The process involved returning to the outcome within the original transcript or document and searching for connected mechanisms and contexts. This search for connected threads resulted in the articulated context-mechanism,

outcome configurations. A final stage of abstraction occurred as the concepts within these CMO theories were analysed to identify key themes.

#### 3.3.4.1. Framework analysis

Originating in the work of Ritchie and Lewis (2003) framework analysis is a form of thematic analysis widely used in the analysis of semi-structured interview data and in document analysis (Gale et al. 2013). As is common with such thematic approaches it seeks to identify that which is common and that which is unique in the data. It then explores potential connections between different parts of the data and in so doing assists the researcher in forming possible descriptive and/ or explanatory accounts (Gale et al 2003; Ritchie et al. 2003). It uses thematic frameworks and a series of systematic interconnected stages to classify and organize data according to identified themes, concepts and emergent categories (Ritchie and Lewis 2003). It proceeds through the following stages: transcription, familiarization, coding, development of the analytical framework, framework application, charting the data into the framework, and data interpretation.

#### 3.3.4.2. A justification for using framework analysis

When selecting an approach to data analysis it is important to consider the nature of the research questions, the type and volume of the collected data, along with issues such as trustworthiness (Lincoln and Guba 1985). The intent is to select an approach that is truly fit for purpose. Framework analysis was selected for this study as it was thought to address the following study needs. The study produced a large body of data including 25 transcripts and numerous documents, therefore, it was important to select an analysis approach that could support a large data set and would produce an output from the analysis that was both manageable and comprehensive. It was also important to select an approach that could both reduce the data but also maintain the connection to the whole data set. This is particularly important as this study adopts a realist approach in which the researcher explores the data to uncover context mechanism outcome configurations. Contexts, mechanisms, and outcomes are not seen as isolated components but rather as interconnected threads. An approach was needed that searches for connections, for how participants discuss how contexts impact the firing of mechanisms and in so doing shape the programme outcomes. The development of explanatory accounts was of particular importance to this study and framework analysis provided a systematic and transparent process to generate CMOC hypotheses, examining the data for ways in which subjects connected mechanisms, contexts, and outcomes. Such analysis required an approach that could facilitate in-depth data analysis and a data reduction process capable of retaining links to the original data.

This study involved interviews with different participants, student leaders, faculty, and student volunteers who may also have served as designers, deliverers, or participants of the IP SRC. It was therefore important for the analysis approach to provide the ability to

examine data within each participant, between participants, and across relevant participant groups. The approach also needed to be capable of facilitating the process of abstraction through the identification and classification of coded contexts mechanisms and outcomes and creation of CMO theories that articulate their connections. The matrix design of the coding framework permitted data reduction to the level of individual interviews, sample groups, or the entire data set and allowed for both a case and theme-based approach to analysis.

Lack of transparency is a commonly cited criticism of qualitative studies (Maggs-Rapport 2001). Framework analysis provided a systematic and transparent process of data analysis that is argued to enhance the rigor and credibility of the study findings (Smith and Firth 2011; Mays and Pope 2000; Ritchie and Lewis 2003) and provides an effective audit trail (Smith and Firth 2011). During data management, raw data were reviewed, labelled, sorted and synthesized. Descriptive accounts were then generated through detection, categorization, and classification of the data. This involved identifying substantive content and dimensions within the data, refining the initial categories and, examining associations between categories to identify key dimensions, and developing classifications or typologies. The final level of the hierarchy involves pattern detection and the development of linkages between sets of phenomena to generate explanatory accounts. In the case of this study, such patterns are represented as CMO theories. Unlike approaches such as grounded theory, framework analysis is not aligned with a particular discipline, epistemological, philosophical, or theoretical approach. As such, it is a flexible tool that can be used for many qualitative approaches and arguably a good fit with the rather pragmatic stance of the empirical realist.

#### 3.3.4.2. Data analysis process

The following section describes the data analysis process highlighting how framework analysis was applied within this study. Figure 3 outlines the stages of this process.

##### **Transcription**

The interview audio recordings were transcribed using a combination of Nuance Dragon Dictation Software, and Transcription for Mac. In using Dragon Dictation, a voice profile was created from a sample section of the interviewee's voice taken from the interview recording. This was used to train the software to each unique individuals voice. The researcher transcribed three interviews using Transcription for Mac, as Dragon Dictation was unable to effectively train to his or her voice. Interview transcripts and retrieved documents were entered into NVIVO 11 for windows.

### **Familiarization**

The interviews were conducted over a series of three visits to the site. At the end of each site visit, the researcher listened to the audio recordings and read through their interview notes. All interview transcripts were created by the researcher, which involved listening to, reading and rereading individual segments of interview recordings as well as the entirety of the interview. The necessary editing to ensure an accurate representation of the participant's words was captured through the use of Dragon Dictation also required repeated listening and reading of the audio files and transcripts. This allowed a significant opportunity for familiarization with the full interview data set. Programme documents were read and re-read before being entered into NVIVO for coding.

### **Coding**

Inductive open coding was performed on all interview transcripts and documents using hard copies and electronic copies in NVIVO. The researcher initially attempted to code only in NVIVO but combining paper copies and NVIVO proved to be a more thoughtful and productive approach. The researcher found that when using only NVIVO coding tended to become a more process driven activity and felt a more thoughtful approach was achieved by assigning codes on hard copies then entering the codes in NVIVO. The use of annotations of analytical notes, thoughts, and ideas, was also found to be a more focussed process using paper copies.

### **Development of the analytical framework**

The initial analytical framework was developed following analysis of the transcripts from interview series 1 and the documents retrieved after the first site visit. All transcripts and documents were subjected to inductive open coding. The generated codes were reviewed and consolidated into meaningful categories. These categories were then classified according to the pre-determined classifications of outcomes, mechanism resource, mechanism reasoning, and context. This deductive classification process allowed items to be represented in more than one class. This is an important feature of this step of the process as realist thinking argues that a particular component of a programme may function at times as a mechanism, and at other times as a contextual element, and it may also be present as an outcome. The use of exclusive classifications would, therefore, be artificial and would lose the interplay of these components. Therefore items were categorised according to how they were articulated by the participant in the coded text. This required a continuous process of going back to the original data and viewing it in its original context.

Initial codes were classified and given a 'yes' if it was a clear fit and a 'maybe' if unsure of the fit to the category. The review process of revisiting coded sections of text in their original context was important for making the decision on confirming or not confirming categorizations.

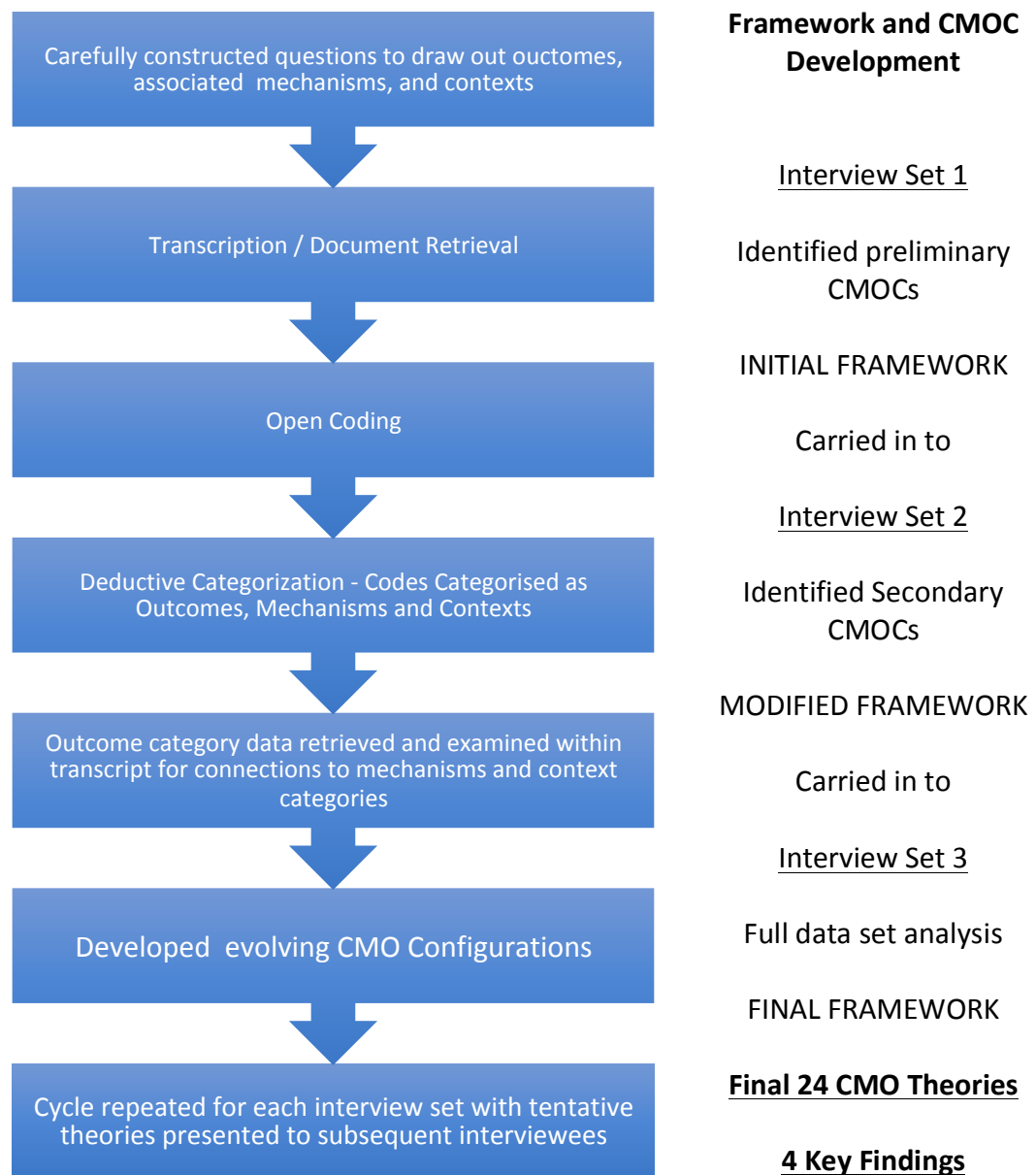
Visiting and revisiting the coded sections of text proved to be a very laborious but very productive endeavour. It is hoped that this additional attention to the classification process and development of the analytical framework has enhanced the trustworthiness and particularly the credibility of the findings. Additional categories were developed based upon the codes elicited from the open coding that represented items such as questions asked by the researcher, and the researcher introductory and close out statements. These data were categorized to allow for their use in the process of reflexivity. The framework tool within NVIVO was used to create a matrix and the data were charted into the matrix.

### **Interpreting the data: A search for connected threads**

This involved a complex process involving the search for connections between outcomes, mechanisms, and contexts within the data. The search for connected threads began with outcomes, as the sequence of interview questions began by asking participants to identify outcomes. Participants were then asked what they thought might be producing such outcomes (mechanisms), and in which contexts these outcomes might occur.

For each identified outcome the coded text was reviewed within the original transcript or document from which it was derived, with the purpose of locating associated mechanisms and contexts. This examination of outcomes and their connected mechanisms and contexts, through analysis of the data elements in-situ, was an important step in ensuring the context, mechanism and outcomes were derived from the data, and the resultant CMO theories were based upon the connectedness of these elements within the original data. Contexts and mechanisms were designated as associated with the outcome if they were located within the follow-up context and mechanism questions (proximity within the text), or were connected by the interviewee by referring to, referring back to, or directly associating one with the other. In addition, using what Westhorp (2008), refers to as “linguistic joiners” such as ‘because’, ‘and’, ‘like’ or ‘but’, to tie the components together was also regarded as a connection. Framework analysis provided an effective and efficient approach to accumulating, comparing and contrasting these connected threads across participants, and documents.

For each identified outcome, all of the data within this category e.g. team formation was re-examined within the original text to identify connections to mechanisms. The outcome–mechanism pairings, were then examined within the data for connected contexts, leading to the development of the context, mechanism, outcome configurations (CMO theories). This was a very lengthy and intensive process of data analysis, which was repeated after each site visit amending and modifying the framework and emerging CMO theories as the analysis progressed (See Figure 3). A further stage of abstraction involved analysis across all of the of the CMO theories to identify key themes across the data. This process resulted in the formation of 4 key study findings.



**Figure 3:** Showing the data analysis and framework development process

### 3.4. Addressing trustworthiness in the study

Trustworthiness is an important concept in establishing the quality and worth of a qualitative research study. Lincoln and Guba (1985) highlighted the importance of the following four items in establishing the trustworthiness in qualitative research, credibility, transferability, dependability, and confirmability. The following section describes the strategies utilized to address these important issues throughout this study.

#### 3.4.1. Credibility (internal validity)

Credibility is concerned with the degree of confidence in the 'truth' of the study findings (Holloway and Wheeler 2002; Macnee and McCabe 2008). It addresses how plausible the research findings are in representing the perspectives of the participants (Graneheim and Lundman 2004; Lincoln and Guba 1985) and as such addresses issues of rigor in the research process and the accuracy of presenting what was done (Gasson 2004). Polit and Hungler (1999) suggest that issues of credibility start with the study focus and on how well the design, conduct, and analysis address this intended focus.

##### *3.4.1.1. Prolonged engagement and persistent observation*

Prolonged engagement was an important strategy used to ensure a rich and thick description of the case study site could be elicited. Prolonged engagement involves the researcher spending sufficient time at the study site to gain appropriate insight into the phenomenon under study.

This can involve time observing, meeting and developing relationships and rapport with individuals at the site. Such rapport can be important in facilitating the co-construction of meaning that occurs when a researcher and participant engage in the interview process. An important aspect of prolonged engagement is that it opens the researcher to the multiple perspectives, participants, and contextual factors at play within the site.

The researcher attended the study site repeatedly throughout the year. The duration of site visits ranging from 3-7 days. The initial visits involved meetings with the site gatekeeper, university personnel, clinic personnel, and included a tour of the facilities at the student-run clinic. The purpose of this visit was to develop trust, discuss the study and address any questions. Three visits, spread over a six-month period, involved data collection in the form of interviews with key stakeholders and document retrieval. The final visit involved feedback to the study site.

##### *3.4.1.2. Triangulation*

Triangulation involves the use of multiple data sources to enhance understanding of the phenomenon of interest (Denzin 1978). The use of triangulation can assist in ensuring the researcher's account is both comprehensive and rich, developing both breadth and depth of understanding of the phenomenon.



Several types of triangulation have been identified including; triangulation of methods, sources, analyst, and theory/perspective (Denzin 1978; Patton 1999).

This study has used triangulation of methods and sources to assist with study credibility. Using both semi-structured interviews and document analysis provided opportunity to examine the consistency of findings generated by these different data collection methods. Faculty interviews were used for the purpose of triangulation of the student data. Choosing participants with varied experiences allowed the researcher to explore different aspects of the clinic, and different viewpoints and perspectives (Adler and Adler 1987) potentially adding a richer variation in the data (Graneheim and Lundman 2004). Triangulation of sources allowed the opportunity to examine the consistency of different data sources within the same data collection method (Patton 1999).

#### *3.4.1.3. Peer debriefing*

“A process of exposing oneself to a disinterested peer in a manner paralleling an analytical session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer’s mind” (Lincoln and Guba 1985, p.308). It is argued that this has been an on-going process throughout the planning and conduct of this study. The role of the de-briefer has been played by the research supervisors and has been conducted through research supervisory meetings. The research supervisors have challenged the researcher’s perspectives and assumptions, and afforded opportunities for testing and defending the process, justifications for, and product of the study design, data collection, and analysis. This has provided opportunity for the researcher to reflect upon their decisions throughout the research process and defend their stance on emergent concepts and ideas.

#### *3.4.1.4. Negative case analysis*

This involves searching for and discussing elements of the data that do not support or appear to contradict patterns or explanations that are emerging from the data. This is an interesting topic with regards to the empirical realist stance adopted in this study. Such an approach accepts the diversity of outcomes that can be generated by a programme and is innately focused on the search for that which is specific and that which may be generalizable. The unique and different experiences and outcomes of individuals triggered the search for explanation, involving an examination of the interaction of mechanisms and contexts that may produce diverse outcomes. As such the search for an explanation of deviant cases is an essential component of the realist approach adopted in this study.

The process of CMO theory development started with identification of programme outcomes. These were then traced back within the data to identify the mechanisms and contexts that produced these outcomes. This approach was thought to permit the identification of potentially different responses for participants to the same context or

mechanism resource. Holding to a realist approach, alternate responses were sought out and all identified responses were recorded through the analysis process.

### 3.4.2. Transferability (external validity)

Transferability addresses the degree to which the study findings are applicable to other times, settings, situations, groups, or people (Polit and Hungler 1999). Gasson (2004) suggests that it pertains to the extent to which a researcher can claim that his/her findings may be generally applicable. To address this issue it is imperative that the researcher provides a clear and detailed description of the study including the setting, participants, data collection, and analysis process (Lincoln and Guba 1985).

#### 3.4.2.1. *Thick description*

In this study the issue of transferability was addressed through the strategy of thick description. Originating in the work of Ryle (1949) the term thick description is used to describe the rich and detailed account provided by the researcher. Such an account details the study and the phenomenon in such a manner that it allows others to evaluate the degree to which the study findings may be transferable.

### 3.4.3. Dependability (reliability)

Dependability asks if the findings are shown to be consistent and repeatable (Lincoln and Guba 1985). It involves careful documentation of the research process. Detailing the emerging design, research activities, and paying careful attention to consistency in the data collection and analysis (Gasson 2004) and requires an explicit description of how the study findings were attained. In discussing the issue of trustworthiness in qualitative content analysis Graneheim and Lundman (2004) highlight the potential risk involved in the data reduction and abstraction process and the need for the researcher to be clear in describing the process used to examine the data. The use of framework analysis in this study provided a comprehensive, systematic, and auditable approach to detailing the data analysis process.

Dependability was also addressed through the provision of a thick description of the research process. As discussed earlier, this involves the presentation of a detailed and comprehensive description of the research process and justifications for the decisions made. The external audit of the process and product of the research study provided by the research supervisors also assisted in addressing the issue of dependability.

### 3.4.4. Confirmability (objectivity)

Confirmability addresses the degree to which the study findings are shaped by participants and not by the researcher. It is concerned with neutrality and the degree to which the study findings represent the phenomenon being studied rather than the interests or biases of the researcher (Lincoln and Guba 1985; Gasson 2004). Triangulation and external audit can

assist in addressing confirmability and were used in this study. In addition, reflexivity was an important strategy adopted in the study.

#### *3.4.4.1. Reflexivity*

Reflexivity is described as an attitude of the researcher involving the systematic examination of the context in which knowledge construction is occurring and the impact of the researcher herself on the research process and product. Malterud (2001) suggests that innate characteristics, beliefs, values and experiences the researcher brings to any investigation will inevitably impact the study topic selection, approach, methods, conduct, interpretation, and representation. A reflexive diary was used throughout the entire research process. This diary contains records of decisions made and the reasoning for such decisions, information on the process of the study, reflections on how various stages of the study were progressing, assumptions that were uncovered, notes on the relationship between the researcher and the participants during data collection, questions that occurred to the researcher and possible answers to such questions, along with general thoughts, ideas, and annotations. This diary has been of immense value to the researcher in the writing of this thesis as it details the research journey from the inception of the original research idea to the completion of the thesis.

### **3.5. Ethical considerations**

The Bournemouth University Ethics Board, the Institutional Review Board (IRB) at the researcher's home institution in the US and the IRB at the case study site granted ethical approval for this study. The following section describes the emergent ethical issues within this study and describes how these issues were addressed. Particular attention has been paid to the unique issues that arise when using the specific approaches adopted in this study; qualitative research, case study design, semi-structured interviews, and document analysis.

Use of a single case site raises particular threats to confidentiality (Stake 2000). The rich and detailed description of the study site that is a key component of case study research exposes an innate risk of identifying the study site and in so doing risks the confidentiality of the study participants (Houghton et al. 2010). Careful attention has been directed towards ensuring that the name and location of the study site have not been disclosed. Throughout the transcription, document analysis, and writing process careful attention has been paid to protect the confidentiality of the university, the clinic, and participants. Pseudonyms were used to replace the names of people and institutions and organization.

The position of the gatekeeper in relation to potential participants can influence the selection of individuals by controlling access. There may also be a risk for coercing participants into

taking part in the study, and for the gatekeeper to influence the responses of participants. To ameliorate these risks the site gatekeeper was only used to identify a pool of potential participants.

The use of semi-structured interviews in this study carries potential ethical issues that relate specifically to autonomy, voluntariness, privacy, confidentiality, disclosure, capacity and informed consent. The right of participants to fully exercise their autonomy was addressed through the process of obtaining informed consent; ensuring all participants were aware that their participation was voluntary and they may withdraw from the study at any time without risk of penalty. Participants were informed about the study through a participant information sheet that identified the purpose and process of the study (disclosure). This information was written to ensure participants could both understand the information provided and form a reasonable judgment on the consequences of their decision to participate or not (capacity) and they were provided at least a week to review the information.

On commencement of the interview participants were assured that if there were any questions that they would prefer not to answer during the interview they should let the interviewer know and the interview would be stopped or would move on to the next question, dependant upon the preference of the participant (right to withdraw).

Potential ethical issues related to audio recording for the purpose of transcription and summarization relate primarily to the issue of privacy. Privacy concerns the right to not be identified and addresses both anonymity and confidentiality (Whiting 2008). Polit and Beck (2006, p.714) describe confidentiality as: 'Protection of study participants such that individual identities are not linked to information provided and are never publicly divulged'. To address these issues each participant was assigned a pseudonym to protect his or her identity and confidentiality this was used in all identifiers for both the recording and transcripts. Any documents with potential to link the participant's name to the pseudonym were kept in a locked filing cabinet in the researcher's office and on a password-protected computer and were only accessed by the researcher. All transcripts and recording were stored in a different password-protected computer in the researcher's office. As per the requirements of the researchers IRB, the audio recordings will be destroyed five years after the study has been completed.

While the methods employed in this study held no potential to physically endanger the participants, there was potential for psychological harm in the form of embarrassment or discomfort for participants. Participants were being asked to open up their work in the clinic, their reasoning processes and decision making to the researcher this holds potential for participants to feel that their work was being scrutinised or critiqued and could potentially lead to discomfort or embarrassment. The potential for such psychological harm was

addressed by ensuring all participants were fully informed regarding the intent of the study, maintaining their confidentiality, and protecting their identity in all data sources.

### 3.6. Chapter summary

This chapter has presented the ontological, epistemological and methodological stance of this study and has described and provided the rationale for the selection of the applied study methods. It has identified the aspects of the study design that were deliberately selected and applied to address the realist underpinning of this study. Including the approach to developing and conducting realist interviews and a unique approach to retaining the connected threads of contexts, mechanisms, and outcomes throughout the data analysis process.

The next chapter begins the presentation of the study findings by presenting the case, the interprofessional SRC, describing its structure and context along with key information regarding the study participants.

# Chapter 4: The Case

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## Introduction

This chapter presents a description of the case, the IP student-run clinic, which is the focus of this study and the location where data were gathered.

The aim of this chapter is to provide the reader with sufficient detail on the contextual setting of the study by providing a thick description of the case. It is hoped this will afford the opportunity for the reader to consider the applicability or relevance of the study findings to the current literature within the field, as presented in chapter 2, and to their own contextual setting. It provides information about the study participants and then describes the IP student-run clinic and the community setting within which it is situated.

### 4.1. Study participants

A total of 25 individuals participated in interviews including 10 volunteer faculty clinicians and 15 students. Table 15 provides information on the participants. To protect anonymity, labels (e.g. FC1) have been used to replace all participant names and only brief information (gender and profession) is provided for individual participants. All other data will be shared as group information.

#### 4.1.1. Faculty clinicians

The 10 faculty clinicians included 3 nurses, 2 physicians, 2 physician assistants (PA), a pharmacist, a physical therapist (PT), and a social worker. They represent one-third of the total faculty supporting the clinic and included five faculty clinicians who had been with the clinic from its inception and five who had joined after the first year when the clinic was established. The nursing faculty clinicians and students were recent additions as nursing was only added to the clinic that year. They were affiliated with a second university that had established a formal partnership with the SRC's host university. Social work was also a more recent addition and the social worker was recruited to participate by one of the nursing faculty clinicians. Social work is not a programme offered by the university that houses the SRC.

Five faculty clinicians including two physicians, a physical therapist, pharmacist, and one of the physician assistants, had been with the clinic from the beginning. This group provided valuable institutional memory regarding how the clinic was designed. The more recent faculty clinicians provided useful insight into how the clinic integrated two new professions.

Faculty Clinicians (FC)		Student Leaders (SL)		Student Volunteers (SV)	
<b>FC1</b>	Female Physician Assistant	<b>SL1</b>	Female Medicine	<b>SV1</b>	Female Physical Therapy
<b>FC2</b>	Female Nurse	<b>SL2</b>	Female Physical Therapy	<b>SV2</b>	Female Physical Therapy
<b>FC3</b>	Female Nurse	<b>SL3</b>	Female Medicine	<b>SV3</b>	Male Physical Therapy
<b>FC4</b>	Female Nurse	<b>SL4</b>	Male Podiatry	<b>SV4</b>	Female Physician Assistant
<b>FC5</b>	Female Physical Therapist	<b>SL5</b>	Male Pharmacy	<b>SV5</b>	Female Medicine
<b>FC6</b>	Female Physician	<b>SL6</b>	Female Psychology		
<b>FC7</b>	Male Physician Assistant	<b>SL7</b>	Female Physical Therapy		
<b>FC8</b>	Female Social Worker	<b>SL8</b>	Male Physical Therapy		
<b>FC9</b>	Male Pharmacist	<b>SL9</b>	Female Physical Therapy		
<b>FC10</b>	Female Physician	<b>SL10</b>	Female Medicine		

**Table 15:** Study participants

#### 4.1.2. Students

Of the student participants, 5 had served solely as clinic volunteers, and 10 had volunteered and served in student leadership positions. The student leaders included students from medicine (3), physical therapy (4), clinical psychology (1), podiatry (1), and pharmacy (1). All of these students had initially experienced the clinic as a volunteer and had then applied for a clinic leadership position. This group was relatively easy to recruit to the study and readily engaged in the discussion regarding the clinic.

The student volunteers represented physical therapy (3), physician assistant (1) and medicine (1). They were all in the first or second year of their programme. This was the most difficult group to recruit with those who participated describing some reticence in putting their names forward believing they had little to offer to the study as they had only volunteered in the clinic a few times, as exemplified on the following quotation from a student volunteer.

*“I wasn’t sure if I could be of help, I had only been in the clinic a couple of times, so I wasn’t sure if I would be able to help”. (Student Volunteer)*

A disproportionate number of student volunteers were from physical therapy (3/5). Only one of the PT volunteer students had served on an IP primary care team with the other two

having worked in the physical therapy specialty clinic. The researcher's professional background as a PT may have been influential. Although they were careful to not explicitly identify themselves by their professional affiliation, in the call for participants, communications via email and in the consent and information forms the researcher's credentials were listed including the designation PT (State licensed physical therapist). Presenting such designation is required by the physical therapy practice act of the state in which the researcher is licensed.

## 4.2. Context

The following section describes the contextual setting for the interprofessional SRC including both the community and institutional settings.

### 4.2.1. Community setting

The clinic is located in the outer suburbs of a large metropolitan city in the Midwest region of the United States. The town in which it is situated has a population of around 35,000 and covers a geographical area of approximately 8,000 square miles. Historically, the town has had a large population of eastern European migrants, African Americans, and more recently Latinos, especially from Mexico. The US 2010 census showed a racial mix of 36.3%, white (Non-Hispanic) 29.92% Black or African American, and 26.8% Hispanic or Latino (11.29% White Hispanic, 15.9% Hispanic or Latino other race) (US Census Data 2010).

Both students and faculty described the local population as economically diverse. This economic diversity is supported by the US Census Data for 2010, which identified the county in which the clinic is situated as one of the 30 richest counties in the US. The same census reported the town in which the clinic is located as having 15.1% of the population with an annual income below the US poverty threshold of \$11,770 for a single person under 65 and \$24,250 for a family of four (US Census Data 2010).

Students and faculty identified health disparities as one of the main reasons for establishing the clinic and describe the local community setting as follows.

*"We are kind of located right between, like, some pretty wealthy areas, and then some areas that have more financial challenges. So one of the reasons for the clinic is to address the growing health disparities in the area" (student leader).*

*"There was just a need in the area that our university is located in for people who do not have health insurance. And there is a very well economic area, with a pretty high health disparity population that is nearby. I mean like really wealthy on one side of the road and really poor on the other" (student leader).*

*"We are in such a wealthy area on the one hand, but we also have some very poor neighbours. They struggle to feed their families and don't have access to healthcare. We have a lot of working poor in the area who need the help the clinic offers" (faculty clinician).*



### 4.2.2. Institutional setting

A private not-for-profit graduate health sciences university is the academic home of the SRC which operates out of the university health clinics. There is clear institutional support for interprofessional education, which is the focus of both the university mission and vision statements. The university's commitment is evidenced through the creation of an institute to support IPE, the appointment of IPE leadership roles throughout the organization, including within the provost's office, and by requiring all first-year students take a semester-long IPE class which is included in the core curriculum for all health professional programmes.

## 4.3. The interprofessional student-run clinic

### 4.3.1. Origins of the clinic

A group of female medical students is credited with originating the idea for the clinic. These students met with faculty from the different professional programmes and administrators from both the university and the university health clinic to pitch their idea for an IP student-run clinic. The following exchange comes from an interview with one of the faculty clinicians present at these first meetings.

*"Their big goals were to have it student-run and also for it to be interprofessional. So they wanted to have the students in roles of responsibility, and they wanted to see patients, but they also wanted to have students from multiple disciplines in the clinic" (faculty clinician).*

**Researcher:** *"So what would you think they wanted to achieve by having those multiple disciplines there rather than just being a medical clinic?"*

*"I think they really did want to practise interprofessionalism, so they had heard about it, but they wanted to actually do it. And that's why they needed participation from other fields" (faculty clinician).*

The students led the development of the clinic with the faculty and administrators providing guidance regarding important issues that would need careful consideration. These included legal issues, supervision requirements of the different professions, mandatory training requirements, use of electronic health records, and patient safety. At the time the faculty reported having concerns regarding the feasibility of establishing the clinic and how the students could make it interprofessional.

*"I said so what does that look like in the clinic? What about when the patient comes in? How is it interprofessional? But the students had done a nice job of looking at some student-run clinics in different interprofessional clinics, I'm not a hundred per cent sure I am accurate on this, but they had come in with the plan about the point of when the patient first comes in. Who do they see? And how do we make that interprofessional? So they had some ideas about that" (faculty clinician).*

*“Um honestly after practicing the number of years I have, I was a little sceptical about how it looks once you're in the clinic. Because from a time perspective we can't all see the patient together. So um, we, they were really working on that, how that initial team helps to send the patient to the appropriate caregivers” (faculty clinician).*

Clinic operations began in 2013 and at the time of this study, the clinic was entering its third year.

#### 4.3.2. Clinic purpose

The mission of the clinic was described as to provide,

“ Accessible, quality healthcare for the underserved and underinsured of *the* County. Our mission is to foster a respectful environment in which students, health professionals, patients, and community members learn from one another by working together interprofessionally” (Executive Officer Board meeting minutes 5.11.2015).

When questioned about the purpose of the clinic students and faculty clinicians articulated three particular purposes.

- To meet the needs of the underserved or uninsured in the local community.
- To provide early clinical practice experiences for students
- To provide interprofessional education in a realistic clinical setting

#### 4.3.3. Clinic description

The clinic is located in the university health centre and operates one evening per week from 4-8pm. It provides free healthcare services to uninsured adults from the local community and community-based health promotion services.

The university health centre is a fully operational medical community clinic providing primary care services, podiatry, behavioural health, immunizations, and reproductive health to the university students and personnel, and to the local community, with payment through insurance coverage. The building is a former mansion house with clinical and office space located on the main and lower levels. The student-run clinic makes use of the facilities in the evenings after regular clinic hours. As such, they are well equipped with a reception, waiting area, exam rooms, lab area, conference room, and a dispensary. The reception desk, waiting area and exam rooms are located on the main level with physical therapy and psychology services located in the basement.

*“The evening hours of the clinic allow patients to see multiple, different providers in one visit, allowing for a more favourable time for those who lack paid time off from work, transportation, or childcare” (website/ documents).*

The SRC provides free primary care and specialty services including ophthalmology, physical therapy, podiatry, psychology, and women's health.

#### 4.3.3.1. Population served

A faculty member described the population served by the clinic as follows.

*“ So the clinic is set up to deliver care to the underserved in the community. Many of them take buses to get there, ride bikes, it takes them a long time to get to the clinic and that’s often after a hard days work in hard physical labour jobs. But it’s their only option for care, especially if they are undocumented”* (Faculty clinician).

Undocumented refers to those individuals who do not have a legal right to reside in the US, and as such, do not have access to healthcare insurance coverage. In the geographical area of the clinic, this population is primarily first-generation migrants from Mexico. For this reason, the clinic provides Spanish translation services with interpreters accompanying patients throughout their clinic visit as needed. The interpreters are students who receive training to become certified medical interpreters.

#### 4.3.3.2. Clinic volunteers

The clinic is completely staffed by volunteers. Volunteer faculty clinicians provide student supervision and also serve as care providers. Student volunteers man the reception area, manage all aspects of the clinic operations, evaluate and treat patients, perform lab tests, serve as medical translators, and senior students serve as peer mentors. There is greater representation of students from medicine and pharmacy, which are the largest programmes on campus.

#### 4.3.4. Theory used in the design of the clinic

Analysis of the full data set of documents and interview transcripts failed to identify any explicit reference to a theory or theories used in the design or development of the clinic. Several terms that may allude to underlying theoretical assumptions by the clinic designers were evident in the minutes of the student board meetings. These were service learning, interprofessionalism, and integrative primary care. Although these terms were used, their application to the clinic was not described. For example in a meeting where the amalgamation of an existing PA and a psychology clinic into the SRC was discussed, the minutes stated that they should consider *“Integrated primary care as a model”* (meeting minutes 28/3/13) but nothing further was reported regarding if or how this may have been addressed in design of the clinic.

With respect to the interprofessional aspects of the clinic the term interprofessionalism appeared in the minutes of the student board meetings to describe *“ how we make the leap from doctors at the top to working as a team”* (Minute meetings 8/3/13) and the same meeting minutes stated the clinic would *“have to be an equal status environment to be*

*interprofessionalism*". It was evident the student designers were interested in the interprofessional aspects of the clinic and were cognizant of the need for an equal status. They discussed proportional representation as an approach to ensuring equal opportunities for student from different professions to serve on the student leadership team. Considering class size, professional representation, and how to process applications for student leadership positions considering "*how many representatives we will need from each school*" (Board meeting minutes 14/4/13) and how to "*get students involved in the clinic through proportional representation*" (Board meeting minutes 28/3/13).

#### 4.3.5. Clinic model

Documentation from a student presentation identified several potential care delivery models evaluated by the student clinic designers. The students engaged in a dialogue together to evaluate the potential of each of these models to achieve their idea of what an interprofessional clinic should involve.

They considered a traditional primary care model where physicians or physician assistants would see patients and refer to specialty services as needed. They viewed this model as representing how most medical care is delivered in the US and believed scheduling would be simplified with certain days reserved for specific specialties or services and they also believed it would be easier to organise faculty scheduling and oversight. Despite these pros, this model was viewed as "*de-emphasizing interprofessional education and healthcare delivery*" and "*reinforcing existing medical hierarchies of care*". Judging this option as "*safe but not innovative*" (documents: student presentation 19/4/13), it was rejected.

They examined a second model where all patients would be seen by a complete interprofessional team. They saw several benefits to this model, patients could receive comprehensive screening for all their health needs and could access care for multiple needs on their first clinic visit. Students could work together in interprofessional teams and they believed this model would avoid prioritizing physicians over other health professionals. It was rejected as it was viewed to be "*interprofessional but not pragmatic*" (documents: student presentation 19/4/13), involving too many people in the exam room, requiring more faculty supervisors, and a "*scheduling nightmare*" (documents: student presentation 19/4/13). The designers were also concerned that this model would be boring for students.

The third was a group practice model with patients self-selecting from a menu of available services. The advantage of this model was suggested to be the capacity for patients to self-select and self-refer to services. This model was rejected as it was thought to require patients to make multiple trips on multiple days to access care for their health needs creating potential scheduling issues for the clinic. This model was described by the student

designers as, “*convenient but not thorough nor interprofessional*” (documents: student presentation 19/4/13).

The fourth model considered by the students was a role-switching model. Involving a comprehensive health promotion visit addressing stress, needs, diet, and exercise. In this model, the students would switch roles from session to session providing different aspects of the educational content. This model was described as fostering the development of understanding and empathy, but they did not identify the understanding of what, or empathy for whom? This model was rejected and no reasoning was given to support this decision in either the presentation or the meeting minutes.

The ways the students evaluated and balanced the pros and cons of these potential models provides some insight into how they expected the clinic to work. They clearly wanted the clinic to be innovative, interprofessional, and thorough. That it could address multiple needs for the patients in a convenient manner, provide some patient choice, and be practical for scheduling patients and faculty clinician supervisors.

The student clinic designers initially selected and developed a care delivery model, which they described as a screening team model (documents student presentation 15/5/13). This consisted of two teams, a patient advocate team, and a medical team. The patient advocate team of two to three student patient advocates would triage the patient and follow them through a series of assessment stations manned by a team of medical students. On completion of the visit, the advocates would present an integrated care plan to the patient and would debrief the faculty mentors on each patient at the end of the night. Although the students did initially develop this model they quickly adapted it as they saw the role of the patient advocates as being somewhat redundant. They also wished to provide a “*more comprehensive head-to-toe evaluation*” through the inclusion of more professions and to reduce the number of hand-offs (hand-overs) between professions (EOB meeting minutes – 8/14). The final clinic model merged the patient advocates and assessment teams to creating IP primary care teams. (Documentation: student presentation 03/14).

There was no evidence that faculty or university administrators brought options to the table, the documents suggest the students were the one's out seeking options and models, e.g. visiting other SRCs, and seeking advice from the Society of Student-Run Clinics (a student organization formed by students engaged in developing and delivering SRCs). The student clinic designers presented their ideas for the clinic to the faculty and university administrators, as evidenced in the minutes of the initial student leadership board meetings and slides from such student presentations. There is no evidence within the data that faculty or university administrators played a role in the design process. This finding should be taken with some careful consideration of the source of the analysed documents, which were the

property of the student leadership team; as such they may not reflect the faculty contributions to the clinic design.

#### 4.3.6 Expected student outcomes

While no student outcomes were identified in the documents, interviews with clinic designers revealed two expected outcomes for students who participated in the interprofessional primary care teams. Because the clinic is interprofessional, students were expected to gain an increased understanding of the roles and responsibilities of other professions, and recognise and value the importance of professions other than their own to the provision of quality patient care.

Volunteer students who were in the first year of their professional training were described as entering the interprofessional primary care teams possessing limited knowledge of the roles that their own, and other, professions play in providing quality patient care. The clinic designers believed real-life patient encounters would provide opportunities for contextualizing the roles of each profession in the care of a real patient. Assisting the students to realize how patient care is impacted by the combined contributions of different professions. That through such shared experiences they would come to recognise and value the importance of other professions to the delivery of quality patient care. The following example quotation comes from a student leader who was involved in the clinic design from the very beginning.

*“We hoped they would come to see ‘what I can offer, and what you can offer’ to this person. See how these contributions fit together in an overall care package for this actual person” (Student Leader).*

#### 4.3.7. Different interprofessional opportunities for students in the clinic

Although the designers intended the primary care teams to be the interprofessional student experience within the clinic, from the descriptions of the clinic in the documents and interview transcripts it is apparent that the clinic provides three very different interprofessional opportunities.

- The interprofessional primary care team
- The interprofessional leadership team
- The specialty clinics

##### 4.3.7.1. Interprofessional primary care team

The four-person interprofessional primary care teams consist of students from medicine, nursing, and pharmacy, plus a podiatry or occasionally a clinical psychology or physical therapy student. Each team included a student leader who served as a clinic manager with

responsibility for the electronic medical record (EMR). The teams are formed anew each week, consisting of different group members each time. Five of these interprofessional primary care teams worked each clinic night.

A faculty member who had been with the clinic since its inception talked about the students' ideas for the interprofessional teams,

*"It was their idea that it should be interprofessional and they came up with the initial plans of how that might work. That they would sort of be interviewed by an interprofessional team to determine what the patient's needs might be"* (Faculty Clinician).

The clinic manager assigns one of the patients to each of the interprofessional teams and if needed an interpreter is also assigned to the patient. Working out of a designated cubicle area the student team reviewed the patient's information and planned their evaluation. They met with the patient to take their history, record vitals, and complete the initial examination. A student clinic manager provided peer mentoring during this process. Following the assessment, the team worked together to prepare a presentation of their initial findings to an interprofessional team of faculty clinicians. The faculty team reformed each clinic evening, with membership and professional representation dependent upon the availability of faculty clinician volunteers. It included a combination of a physician, physician assistant, nurse, nurse practitioner, pharmacist, psychologist, physical therapist, or podiatrist. The student team presented to the faculty who asked questions and helped the students work through their clinical reasoning and decision-making process. The primary care provider (physician, nurse practitioner or physician assistant) then went back to see the patient with the student team. They completed the physical examination and with guidance from the faculty clinician developed and administered the treatment plan. One of the team members took the patient to get any necessary lab tests, pick up any prescribed medications, make their next appointment, or set up a referral to other services. The team then completed their documentation of the patient visit entering their notes into the electronic medical record. Visits tended to be long, and patient flow through the clinic was highlighted as a problem in many of the board minutes. As described in the literature review the interprofessional primary care team is the most common model used within interprofessional student-run clinics.

The students in the interprofessional primary care area share responsibility for the patient assessment and care planning, and work together at the beginning of the evening to determine their roles and tasks in the patient assessment process, however the short duration, with students working together for only 4 hours on a single occasion, provides little opportunity for members to integrate their work or to form a team.

#### 4.3.7.2. Interprofessional student leadership team

The clinic leadership team includes an Executive Officer Board and an Interprofessional Panel. The Executive Officer Board (EOB) consists of 13 student members elected to office by their peers. The designated roles for the EOB members are provided in Table 16.

President	University Relations Officer	Clinical Affairs – Chair of Interprofessional Panel	Archivist
Treasurer	Community Outreach	Clinical Affairs – Chair of Medical Informatics	Research
Fundraising	Resource & Educational Development Officer	Clinical Affairs – Chair of Operations	Multilingual Affairs

**Table 16:** Executive Officers Board roles

Two key functions of the EOB were identified; liaison and collaboration with the University and Health Centre administration to ensure the clinic remains compliant with legal and financial requirements, and decision-making regarding the structure and functioning of the clinic. The board meets weekly or fortnightly and their work involves considerable problem solving as demonstrated in the following quotations from student leaders.

*"At these meetings, they are long, but they are usually really good. Talking about all the issues that we've had from the previous week, or two weeks, and how we can address them. Working together to solve the problems that come up"* (student leader, EOB member).

*"A lot of its kind of, trying to address our mistakes, or how we can better, improve. And so if we're having a problem we usually take it to the EOB advisor for our various committees or bring it to the panel. And usually it's working, the EOB and panel working together to kind of resolve these issues"* (student leader, panel member).

The interprofessional panel consists of 60+ students organized into 19 subcommittees (see Table 17) with responsibility for specific aspects of the day-to-day operations of the clinic. Students who have served as volunteers in the clinic stand for election to the panel.

Women's Health Services	Research & Quality Assurance	Electronic Medical Records (EMR)	Patient Appointments
Front Desk	Fundraising	Labs & Supplies	Faculty Liaison
Patient Education	Pharmacy	Spanish Services	Podiatry
Student Training	Website	Ophthalmology	Referrals
Clinic Managers	Community Outreach	Student Scheduling	

**Table 17:** Panel committees (EOB minute meetings 11.5.15)

Clinic managers receive extra training allowing them to be a person of record for the EMR and to be the point person to answer questions from patients or faculty clinicians. The clinic managers have designated places on the interprofessional teams, with one manager per team each night. As the teams require a trained EMR user the clinic managers work more shifts at the clinic than other volunteers. With regards to the EMR, a student leader described the on-going commitment to the training of clinic managers.

*"They have to be comfortable with it, entering prescriptions, doing labs, that sort of thing, they have to come to panel meetings and keep up to date when we make changes to the system. This is just our second year and so we are trying to fix some*



*issues, make everything run a bit smoother, so we are making changes to the protocols every couple of weeks. So they have to come to the meetings to keep up to date, they are responsible for that” (student leader).*

The student leadership team represents prolonged participation on a stable interprofessional team with team members serving for at least a year. Participation involves collaborating on a regular basis through participation in weekly or bi-weekly team meetings, additional meetings with the university and clinic administration, regular volunteering in the clinic, and engaging in frequent in-person, telephone, and email communication with teammates.

#### 4.3.7.3. Specialty clinics

The SRC offers specialty services for podiatry, ophthalmology, women's health, physical therapy, and psychology. Referrals come from the interprofessional primary care teams and from outside agencies (e.g. other free clinics in the area). If the referral comes from the interprofessional primary care team the patient may be seen on the same evening if an open appointment is available, or they may make an appointment for a future visit. In the physical therapy and podiatry specialty clinic students from a single profession assess and treat patients under direct supervision of faculty clinicians from their own profession. As social work was added to the clinic a natural connection formed between psychology and social work around the psychosocial concerns of the patients presenting at the clinic. These professions reported frequently working closely together on patient care often forming a two-person team. Ophthalmology and women's health were more interprofessional in nature and accepted students from various professions e.g. PA, medicine, and nursing, with supervision provided by a physician, nurse or PA.

It is clear that the opportunities for interprofessional interaction and collaboration varied across the specialty areas. Some areas reported very limited opportunities (physical therapy) while others involved a regular partnership between professions (psychology and social work), or opportunities to learn with from and about each other (women's health and ophthalmology).

The specialty clinics represent a rather traditional care model of referral to, and consultation from, specialty services, with the students primarily working and learning with students from their own profession under the supervision of faculty clinicians from their own profession. There are limited opportunities for interprofessional collaboration. Available options include being shadowed by students from another profession, providing ad hoc consults to the primary care teams, or working in the women's health or ophthalmology specialty clinics. While the women's health and ophthalmology clinics do take students from different professions, participation is restricted through a selection process based on the perceived relevance of the experience to the student's profession. This usually resulted in students

from physical therapy and psychology being denied access to these opportunities. The specialty clinics do not provide the opportunity for students to engage with other professions on more than an ad hoc basis presenting no real opportunity for them to develop as interprofessional teams.

It is clear that the clinic is made up of two distinct services, the interprofessional primary care teams, and the specialty services. Although they are co-located in the same building it is apparent that they function in very different ways.

## Chapter summary

This chapter presented the case, the interprofessional student-run clinic, which is the focus of this study and the location where data was gathered. The aim was to present the study participants and provide the reader with a detailed understanding of the structure and functioning of the clinic. A lack of explicit theory used in the design of the clinic was highlighted and some implicit assumptions arising from the student designer's deliberations over the appropriate clinic model were presented.

The next section presents the programme CMO theories, which seek to explain what happened when the interprofessional SRC was implemented.

# Chapter 5 - Findings

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## Introduction

This chapter presents the programme context mechanism outcome (CMO) theories developed to address the second research question, which asked, what worked, for whom, in which circumstances, in what respects, and why? The findings are presented in four sections, the first three present programme theories that seek to explain what worked for students who participated in three interprofessional learning opportunities within the clinic: the interprofessional primary care team (5.1), the interprofessional student leadership team (5.2), and the specialty clinics (5.3). While the focus of this study was on students, data analysis revealed several programme theories, developed from the perspectives of faculty clinicians and students that address how they believe the clinic works for patients. These programme theories are presented in section (5.4) As the focus was on the student experience of IPE within an SRC, no faculty CMO theories were developed.

Careful attention has been given to ensure the study findings are presented in a manner consistent with the realist approach adopted in this study. The findings are not presented as codes, categories, and themes, but as CMO theories, presenting connected context, mechanism and outcome threads. Each section opens with a table presenting the compiled CMO theories for each experience e.g. the IP primary care team. The CMOs are then presented visually, using Dalkin et al.'s (2015) formula:

$$(M) \text{ Resource} + \text{Context (C)} \rightarrow (M) \text{ Reasoning} = \text{Outcome (O)}$$

As described in chapter 3 this formula was used in both developing and presenting the CMO theories. This is followed by a description of the connection between each component. The description commences with the mechanism resource and associated outcomes, as this is where the formulation of the CMO connections began within the analysis process, followed by the contexts and mechanism reasoning.

The data analysis process helped ensure that connections between contexts, mechanisms, and outcomes, and the resultant CMO theories, were generated directly from the data. Quotations from interview participants and document extracts have been used in presenting the findings with the intent of demonstrating this connectivity.

## Section 5.1 - Programme theories that seek to explain how the interprofessional primary care team works for students

Five CMO theories were developed (see Table 18) that seek to explain what worked for students in the interprofessional primary care teams, in what circumstances, in which respects? They address what happened to first-time volunteers (CMO1 and 2), and returning volunteers (CMO3, 4 and 5).

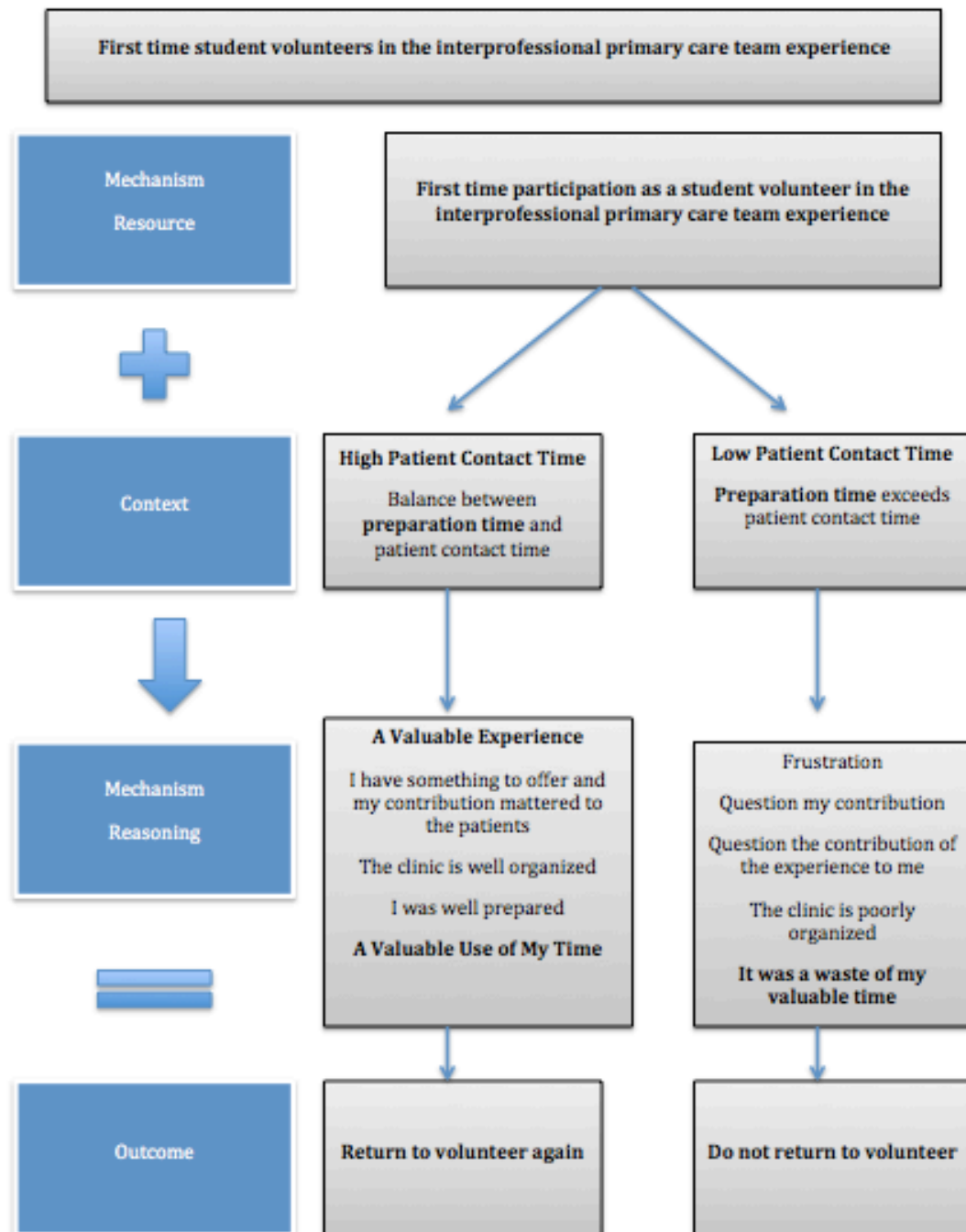
Students and faculty clinicians identified both positive and negative outcomes for students who participated in the interprofessional primary care teams. Interviews with senior student mentors and clinic managers, who were present in these teams on a regular basis, provided valuable insight beyond that of student volunteers and faculty clinicians whose presence was more sporadic.

### 5.1.1. IP Primary Care Team CMO Theories 1 & 2 – Which seek to explain how the first volunteer experience in the Interprofessional primary care team shapes student's decisions to return or not to return to volunteer again

It was evident that some students chose to return to volunteer repeatedly throughout the year (outcome 1) while for other students their experience in the interprofessional primary care team was very limited, volunteering on only one occasion and subsequently choosing not to return (outcome 2). Two connected CMO theories seek to explain how the same resource, volunteering for the first time in the interprofessional primary care team, resulted in different outcomes. They describe the action of two contexts, contact time with patients, and preparation time, which were thought to shape student outcomes via their impact on the student's reasoning. In particular, reasoning regarding the value of the experience and the value of their time (mechanism reasoning). These two connected CMO theories and the pathway to these different student outcomes are shown as a flow diagram in Figure 4.

**Table 18:** CMO Theories for the interprofessional primary care team

CMO	Resource	+	Context	→	Reasoning	=	Outcome
1	First time experience as a student volunteer on an IP primary care team		<ul style="list-style-type: none"> <li>• High patient contact time</li> <li>• A good balance between preparation time and patient contact time</li> </ul>		<b>A valuable experience</b> A valuable contribution to patients A valuable use of my time		Students return to volunteer
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
2	First time experience as a student volunteer on an IP primary care team		<ul style="list-style-type: none"> <li>• Low patient contact time</li> <li>• Time taken for preparation activities exceeds patient contact time</li> </ul>		<b>A waste of my valuable time</b> Questioning my contribution to patients		Do not to return to volunteer again
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
3	Repeated participation as a volunteer on an IP primary care team		<ul style="list-style-type: none"> <li>• A Shared novice status</li> <li>• Novice students lacking confidence and experiencing some fear and anxiety</li> <li>• Role modelling collaborative behaviour</li> </ul>		<b>Equal status</b>		Increased confidence in themselves and their abilities Reduced fear and anxiety
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
4	Repeated participation as a volunteer on an IP primary care team		<ul style="list-style-type: none"> <li>• Role modelling hierarchy and professional dominance</li> </ul>		<b>Unwanted and disrespected</b>		Reinforced negative stereotypes Reduced confidence Reluctance to speak up Reduced engagement with the dominant profession. May limit future engagement
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
5	Repeated participation as a volunteer on an IP primary care team		<ul style="list-style-type: none"> <li>• Equal Status</li> <li>• Confidence</li> </ul>		A safe place to speak up		Changes in collaborative and communication behaviours



**Figure 4:** Flow diagram showing CMO theories 1 and 2, which seek to explain how contexts and reasoning shape the outcomes for first-time student volunteers in the IP primary care team

### 5.1.1.1. IP primary care team CMO theory 1: Explaining why first-time volunteers on the Interprofessional primary care teams return to volunteer again

**Box 1: IP primary care team CMO theory 1**

Resource	+	Context	=>	Reasoning	=	Outcome
First time experience as a student volunteer on an IP primary care team		<b>Patient Contact Time</b> High levels of direct contact with patients <b>Preparation Activities</b> When students spend equal or less time in preparation for the clinic experience as in direct patient contact during the experience.		<b>A Valuable Experience</b> - I made a valuable contribution to the patients - This was a valuable use of my time. - I was well prepared - The clinic is well organized.		Students return to volunteer again.

For students who participate as volunteers in the interprofessional primary care teams (mechanism resource) interviewees identified the importance of the first volunteer experience in shaping student decisions to return to volunteer again (outcome 1). Two particular contexts were identified as impactful on this decision, the amount of time students spent in contact with patients during their first volunteer experience, and time spent in the required preparation activities.

#### **Context – High patient contact time**

Students who returned to volunteer in the clinic reported spending the majority of time during their first volunteer experience in direct patient contact.

*“Almost all of my time that first night was working with patients. My team saw three people that night. This was my first time working with actual patients, and it was great. I knew right away I wanted to come back”* (Student Volunteer).

A student manager recalling their first experience in the clinic stated:

*“We were so busy, we cared for three patients that night. So we didn’t stop all night. It was so cool. I left really wanting more. I could have stayed there all night”* (Student Manager).

#### **Context – Time spent in preparation activities**

Students were required to complete several hours of required training prior to their first volunteer experience in the clinic. This included necessary training to meet legal requirements including training on the Health Insurance Portability and Accountability Act of 1996 (HIPPA), US legislation addressing data privacy and security provisions for the safeguarding of patient medical information, and Occupational Safety and Health Administration (OSHA) required training. They also completed a clinic orientation covering how the clinic operates and outlining its policies and procedures.

Interviewees identified the time students spent in these preparation activities as an important contextual component. They suggested a balance was needed between the time spent in preparation and time spent in contact with patients during the student's first volunteer experience. This is described in the following statement from a faculty clinician.

*"I think it's important to have students spend as much time engaging with patients during their first night in the clinic. It needs to balance out all the time they spend preparing" (Faculty Clinician).*

And from a student volunteer.

*"There has to be more of a balance of what we have to do to prepare for the clinic and what we do when we are there. We need to be working with patients more to make it valuable, worth the time. Not all prep and no patients" (Student Volunteer).*

### **Mechanism reasoning – A valuable experience**

Students who experienced high levels of patient contact (context) during their first experience as an IP primary care team volunteer reasoned that it had been a valuable experience (mechanism- reasoning), one they desired to repeat. Two student value judgements were identified relating to the value of their contribution to patients, and the value of their time.

#### A valuable contribution to patients – My contribution matters

When students had high levels of patient contact during their first volunteer experience (context), they reasoned that their contribution mattered as they had contributed something valuable to the patients. This led students to perceive volunteering as a valuable experience (mechanism – reasoning) that was worth repeating. This reasoning is demonstrated in the following quotations from students talking about their first volunteer experience and their decision to return to volunteer again:

*"I came on that first night, and I wasn't sure what to expect. But wow! I worked on a team of four students from different professions, we saw three different patients that night. They had so many problems. Although I didn't know that much, because I was just starting my training, it felt really good to be able to help, even in small ways. I was hooked" (Student Clinic Manager).*

*"On my first night in the clinic, I helped with the assessment of three patients, it was a great experience. We worked together and we actually managed to help these people. That was so good to see, that we could make a difference, could contribute, even though we were just starting out. I had to come back" (Student Leader).*

#### A valuable use of my time

When students spent the majority of time during their first volunteer experience in contact with patients they also reported seeing value in the preparatory work required to volunteer in the clinic. They viewed it as important in preparing them for the experience and regarded themselves as well prepared and the clinic as being well organized. This is illustrated in the following comments about the preparation activities from students who chose to return to volunteer again.



*"It took time, all the prep, but it was worth it, I felt ready. It reassured me that it was organized, the clinic you know"* (Student Volunteer).

*"All the prep classes really helped, I felt prepared, ready"* (Student Clinic Manager)

*"I felt reassured that it was well organised and that I was ready to get started"*  
(Student Clinic Manager).

When students believed they were well prepared and the clinic well organised they reported the experience as being a valuable use of their time. Students described their time as a limited and valuable commodity. They described regularly making value judgements about how to spend their time, judging the value of time spent in any activity against potential study time. When students viewed the volunteer experience as valuable they were willing to commit time and effort to the clinic and chose to return to volunteer again (outcome 1). This is illustrated in the following statement from a student volunteer:

*"When you have so little spare time, you choose how to spend it very carefully. That first night in the clinic was so valuable for me. That feeling that I helped those patients, even if my contribution wasn't that big. I knew right away that I really wanted to come back"* (Student Volunteer).

#### 5.1.1.2 IP primary care team CMO theory 2: Explaining why first-time student volunteers in the Interprofessional primary care teams choose not to return to volunteer again

**Box 2: IP primary care team CMO theory 2**

Resource	+	Context	=>	Reasoning	=	Outcome
First time experience as a student volunteer on an IP primary care team		<b>Patient Contact Time</b> Low student contact with patients		<b>A Waste of My Time</b> Feeling Frustrated Question the value of the clinic to me.		They choose not to return to volunteer again
		<b>Preparation Activities</b> When the time taken to prepare for the clinic experience is greater than time spent in contact with patients.		Question my contribution to the patients and the clinic. The clinic is poorly organized. A waste of my valuable time.		

After their first experience as a volunteer on the interprofessional primary care team (mechanism – resource), some students chose not to return to volunteer again (outcome 2). Students who did not return described feeling frustrated by their first clinic experience. Their frustration was associated with limited contact time with patients and the time required for preparation activities.

### **Context – Limited contact time with patients**

Students who did not return to the clinic were reported as spending limited contact time with patients during their first volunteer experience (context). One student volunteer, who reported seeing only one patient during the four-hour clinic, summed this up as follows:

*“I was so frustrated, I waited a long time to get to volunteer in the clinic. I was so looking forward to getting to work with patients. Well, nope, it didn’t work out so well. I only saw one patient all night and all I did was take her vitals. It was so frustrating”.*  
(Student Volunteer)

The lack of patient contact time was reported to be a consequence of patients not attending their appointments as a result of difficulties providing adequate faculty clinicians supervisors. As a result, some students spent very limited time interacting with patients during their first clinic experience. A student clinic manager described this as follows:

*“Yeah, people get frustrated because sometimes you know, like in any clinic, you have people who cancel, people not come in. Or say your attending is stuck in surgery and, you know that type of stuff. They want to be working with the patients, but they end up just sitting around waiting, and that can be pretty frustrating, and they may not come back”* (Student Clinic Manager).

### **Context – Time spent in preparation for the clinic experience**

Greater levels of frustration were reported when students spent a disproportionately large amount of time in volunteer preparation activities compared to the time spent in contact with patients. One student volunteer expressed this situation as follows:

*“When you’ve gone through a couple of hours of different training, you’ve sat through the presentations, done your blood-borne pathogens training, your HIPPA, all that stuff. And you come to the clinic and your like, I saw like half a patient assessment essentially. And so for students like me, that come to volunteer and that’s all they get, that can be, that can be pretty frustrating, and so we don’t come back”* (Student Volunteer).

### **Mechanism reasoning – Wasted time**

Students who have limited patient contact during their first volunteer experience (context) questioned if the experience had been of benefit to them if it had been a productive use of their time. The value of their time was measured with respect to time spent in the clinic versus potential study time. As illustrated in the following comment from a student volunteer:

*“I took vitals, one time, that’s’ really not that beneficial to me. It might have been more beneficial to you know take that three or four hours to study”* (Student Volunteer).

### **Questioning my contribution to the patients**

Students also questioned the usefulness of their contribution to the patients as illustrated in the following comments:

*“I mean, how much help was I? I saw one person, I took their blood pressure and asked a few questions, but that’s all I could do. I didn’t really have anything to offer”* (Student Volunteer).

*“So we have had students who volunteer that one time. Maybe just one patient comes in for their appointment. So they don’t really get a chance to do much or see much. They have told me they feel like they did nothing for the patient they saw. That it’s a waste of time”* (Clinic Manager).

*"We do hear this a lot, that they had exams to study for but they came to the clinic. When they only saw one patient they feel they wasted study time and they didn't help at all" (Clinic Manager).*

When students questioned the impact of their contribution and saw their participation as making no difference to the patients, the experience left them feeling they had nothing valuable to contribute.

#### Time spent in preparatory work

When the time spent in preparatory work, considerably outweighed the time spent in contact with patients, the students described the clinic as poorly organized, and the experience as a waste of their time (Mechanism – Reasoning), time that was valuable and in short supply, time they could have been using to study.

*"I am so short on time. Like, between classes, studying, there's not much spare time. So I feel my time is precious. If I have any spare time I fill it studying. So when I took all that time to do the prep classes and all that for the clinic, then all I saw was one patient. Such a waste of my time". (Student Volunteer)*

*"A waste of time with all that prep, and then what did I do, what did I like add for that one patient. Not much. Wasted my time and theirs." (Student Volunteer)*

And a student leader speaking about comments they had received from volunteers who completed the preparatory work and then had limited patient contact during their first volunteer experience:

*"They tell us about how frustrated they are, that we need to get more organized. That it's too much time in the classes they have to take before they volunteer. Then so little time, well when only one patient turns up. They don't get to really experience the clinic, when they just see the one person and are just sitting around waiting" (Student Leader).*

Students who did not find value in the experience viewed it as a waste of their valuable time (mechanism reasoning) and chose not to return to volunteer again (outcome 2).

For students decisions to return or not to return to the clinic, no alternate responses to low or high contact were found beyond those presented in the primary care CMO 1 and 2.

### 5.1.2. IP Primary Care CMO Theories 3 & 4: Which attempt to explain outcome patterns 3 and 4 for returning student volunteers on the Interprofessional primary care teams

Two CMO theories (CMO 3 & 4) attempt to explain what happened to returning student volunteer on the IP primary care teams and how the action of two particular contexts, novice status, and role modelling may shape their outcomes. Two different patterns of outcomes

for returning volunteers were identified, increased confidence and reduced fear and anxiety (CMO 3) or reduced confidence, reinforced negative stereotypes, reluctance to speak up, and reduced engagement with other professions (CMO 4). These two CMO theories (CMO 3 & 4), and the pathways by which the same programme resource (repeated participation in an IP primary care team) can lead to different outcome patterns (Figure 5).

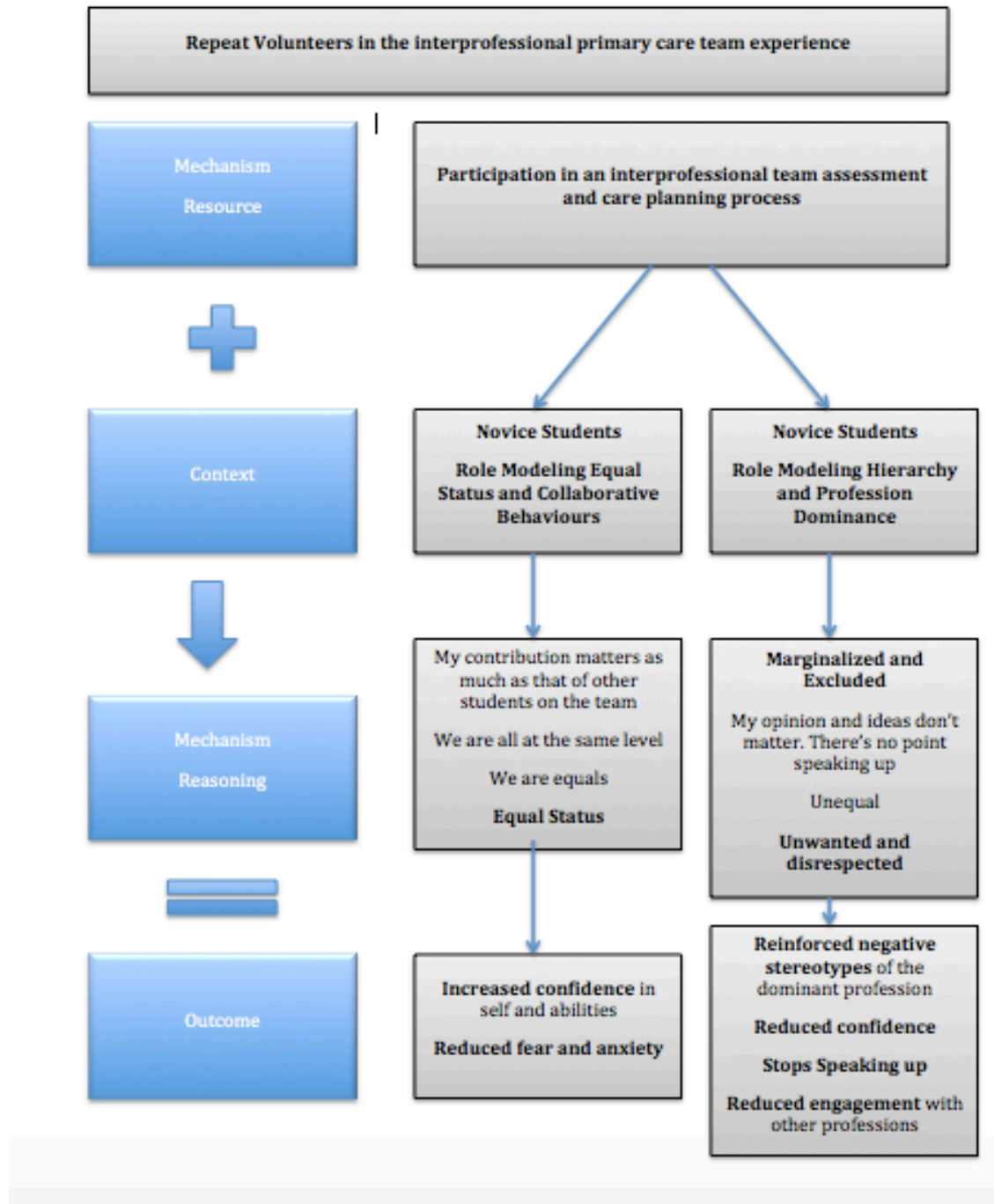
### 5.1.2.1. IP primary care team CMO theory 3: Which seeks to explain how returning student volunteers on the Interprofessional primary care teams develop increased confidence, and reduced fear and anxiety

**Box 3:** IP primary care team CMO theory 3

Resource	+	Context	=>	Reasoning	=	Outcome
Repeated participation as a student volunteer on an IP primary care team		<b>Novice students</b> Students in the early stages of training who lack confidence and enter the clinic with some fear and anxiety. <b>Role Modelling of</b> collaborative behaviours by faculty clinicians, senior students, and clinic managers		<b>Equal Status</b> - My contribution matters as much as other students on the team. - We are all at the same level - We are equals		Feeling equal to the other students in the team results in: Increased confidence in themselves and their abilities and reduced their fear and anxiety

On entering the clinic students in the early stages of their professional programme (novice students) were described as lacking confidence in themselves and their abilities on entering the clinic. For the majority of the students, the clinic represents their first clinical experience (the exception being students who worked with patients in a past career). They report being acutely aware of their limited knowledge and skills and question their ability to perform adequately in patient encounters. Due to their lack of experience students question their capacity to make a meaningful contribution to patients. They described feeling nervous about how they would appear to patients, as stated in the following quotation from a student leader speaking about their early volunteer experiences.

*"I was so nervous, afraid really because at first I was brand-new and I really didn't do any like, patient care type of deal. I didn't know anything about, well really anything because it was early on in the first year and we had just the basic science classes. I wanted to see patients but I was so nervous and thought I didn't have much to offer them"* (Student Leader).



**Figure 5:** Flow diagram showing CMO theory 3 and 4 which seek to explain the experiences of volunteers who repeatedly participate in the IP primary care teams and how elements of the context are theorised to shape their reasoning and resultant outcomes

The interprofessional nature of the clinic was described by students as increasing this fear and anxiety, as it required students to perform in front of, not only patients but also their peers and an interprofessional team of faculty clinicians. A clinic manager talking about their early experiences in the clinic stated:

*"I was so nervous, anxious to begin with. It was worse because there were other professions there, other students and faculty. I didn't want to embarrass myself"* (Clinic Manager).

Given their lack of experience in their profession, they also felt pressure associated with taking on the role of representing their profession.

*"I mean, I had only just started my training, and there I was representing PA on the team, it was nerve-racking"* (Clinic Manager).

*I was so nervous, being the voice from my profession on this team when I had so little experience"* (Student Volunteer).

Interviewees stated that repeated participation in patient assessment and care planning as part of an interprofessional primary care team (mechanism – resource) resulted in increased confidence in themselves and their abilities and reduced their fear and anxiety (outcome). The following quotations represent student responses to questions about how their repeated participation in the clinic may have changed them:

*"I think the big change for me was my confidence"* (Student Clinic Manager).

*"What changed? Well, my confidence in myself for sure in what I could bring to the assessment and care plan"* (Student Volunteer).

*"After a few times in the clinic, I just felt more confident more comfortable in playing my part"* (Student Leader).

*"The fear, the anxiousness about how I would do, especially in front of others, just started to well, leave"* (Student Volunteer).

Two contextual factors, the shared novice status of student participants, and the behaviours role modelled by senior students, clinic managers, and faculty clinicians, were identified as important in the development of increased confidence and reduced fear and anxiety.

### **Context – The shared novice status of student volunteers**

Students began volunteering in the clinic during the first year of their health professional programme, normally within the first, or just as they were beginning their second semester. All were taking anatomy and physiology classes and were being introduced to early profession-specific skills. Interviewees reported this shared novice status as an important context, as demonstrated in the following quotations:

*"I was nervous at the beginning, but then I got to talk to students from the other schools. I realised how similar we all are. We are taking pretty much the same classes, we know the same, well similar things"* (Student Leader).

*"Turns out we aren't that different and we are all in the same boat, all new to this"* (Clinic Manager).

### **Context – Role modelling collaborative behaviours by faculty clinicians, clinic managers, and senior students**

Volunteer students saw the faculty clinicians, senior students, and clinic managers as role models. The behaviours they role modelled within the IP primary care team were thought to be crucial to increasing student confidence and reducing fear and anxiety. Both students and faculty clinicians described the importance of role modelling in 'setting the tone' for the primary care team interactions and creating 'a level playing field' and sense of equality amongst the students.

*"In a truly interprofessional setting we are all on the same level, yeah, and I think it's important for the students to see that from us"* (Faculty Clinician).

*"We have faculty there who really help set the tone for the evening by showing how to work together, how to collaborate"* (Clinic Manager).

*"The more faculty we have from different professions who are actively involved and collaborate, the better it is for us. It feels more equal like it's OK for us to contribute "* (Faculty Clinician).

So which behaviours did they role model? Students and faculty clinicians identified two collaborative behaviours role modelled within the IP primary care teams, facilitating and encouraging student participation and responding to student input in a respectful manner.

#### Encouraging and facilitating student participation

Faculty clinicians, clinic managers, and senior students described a range of strategies they used to encourage and facilitate the participation of all members of the interprofessional primary care team during the patient assessment, discussion of the assessment findings, presentation to the faculty clinician team, and in care planning. They described working to balance the input of all students including efforts to ensure quieter students, those that tended to hang back, were drawn into the discussions. Balancing their input with that of more vocal, or more dominant students. Their main aim was ensuring all students, and all professions had equal opportunity to engage in the team assessments and discussions.

Speaking about the faculty clinicians a student leader stated the following:

*"When they are more interprofessional and collaborative in nature they actually encourage the students to participate, they make sure that everyone introduces themselves, everyone explains who their profession is, what their roles are for this encounter"* (Student Leader).

A faculty clinician speaking about role modelling by clinic managers stated:

*"They are inclusive of the different disciplines and different levels of some people, first years up to fourth years. That style they use can be very welcoming, very positive and respectful and interactive"* (Faculty Clinician).

#### Responding to student input in a respectful manner

When students felt they had something to contribute, the reaction to that input, how the senior students, clinic managers, and faculty clinicians received their input, was identified as

an important factor in achieving the outcomes of increased confidence and reduced fear and anxiety.

The following are example quotations from clinic managers describing when it was clear that the contributions students brought to the conversation were respected.

*“Just being respectful you know, like it seemed in that experience everyone was really respectful of everyone else’s programme, everyone else’s knowledge base, and what everyone had to bring to the table”* (Student Clinic Manager).

*“ You know cultivating a more even level kind of conversation where there wasn’t any you know, competition or anything like that, everyone’s input was respected”* (Student Clinic Manager).

Faculty clinicians were described as responding to the ideas put forward by student volunteers with respect, reinforcing their knowledge, engaging them in further questions, and helping them by working through a problem or a thought process together. When students’ ideas were not exactly accurate, how they were navigated through their thinking to come to new ideas was also thought to be important in increasing their confidence and reducing their fear and anxiety.

### **Mechanism reasoning - Equal status**

During the interprofessional primary care team assessment and care planning process, novice students are provided with the opportunity to work with students from other programmes who are at the same stage in their professional training (novice students). They come to recognize that they all share the same limited knowledge and experience, they are all at the same stage, they are all just starting out. When team members recognize they share this novice status it creates a level playing field and students come to view each other as equals with equal status (mechanism – resource). As voiced by students in the following transcript extracts:

*“It’s a sense that we are equal, equally important”* (Student Leader).

*“It creates a level playing field, we are equals”* (Clinic Manager).

*“We are all at the same level, equals really”* (Student Volunteer).

A student volunteer speaking about the primary care teams described it as follows:

*“And I think in a way, working in these groups, makes it feel like it’s an even playing field, that no profession is above the other. That we’re all kind of equal and we all can contribute something to the patient”* (Student Volunteer).

The students described how seeing one another as equals, as equally limited in their knowledge and experiences, raised their confidence in themselves and in their abilities. When the students saw the collaborative behaviours role modelled by clinic managers, senior students and faculty clinicians (context) and saw how these mentors recognized and demonstrated respect for suggestions and ideas from all participants they reasoned that their ideas were welcomed and their contributions, however small, mattered as much as that of any other student from any other profession. This boosted their confidence and reduced their fear and anxiety (outcome 3).



### 5.1.2.2. IP primary care CMO theory 4: Explaining how the role modelling of hierarchy and professional dominance reinforces negative stereotypes, reduces confidence, creates a reluctance to speak up to share ideas and opinions, and leads students to restrict their engagement with the dominant profession

**Box 4: IP primary care team CMO theory 4**

Resource	+	Context	=>	Reasoning	=	Outcome
Repeated participation as a volunteer on an IP primary care team		The role modelling of hierarchy and professional dominance by faculty clinicians, clinic managers and/or senior students.		Students from the non-dominant profession feel <b>marginalized and excluded</b> . They reason that their contribution and their profession is <b>unwanted and disrespected</b> . That all team members are not treated as equals and they feel lesser than, <b>unequal</b> to others. Development of a 'them and us' mentality		Reinforced negative stereotypes of the dominant profession. Reduced confidence Reluctance to speak up and share their ideas and opinions Reduced engagement with the dominant professions.

For some students repeated participation on an IP primary care team (mechanism – resource) did not result in positive outcomes with both students and faculty clinicians reporting the experience resulting in reinforced negative stereotypes, reduced confidence, increased reluctance to speak up to share their ideas and opinions, and students limiting their efforts to engage with the dominant profession (outcome). A single context, the role modelling of a hierarchical approach characterised by the dominance of a single profession, was identified as the catalyst for these negative student outcomes.

#### **Context – The role modelling of hierarchy and professional dominance by senior students, clinic managers and or faculty clinicians**

Interviewees described having observed or experienced the role modelling of a hierarchical approach and professional dominance by faculty clinicians, senior students or clinic managers during their IP primary care team experience. On the occasions when they had observed or experienced this they described both faculty clinicians and senior students from medicine as presenting the hierarchical or dominant role model.

*“There’s times when it’s very focussed on the hierarchy of medicine, and you speak to me, and you’re supposed to perform for me, and it’s not at all collaborative”*  
(Student Clinic Manager).

*When we don't have as many faculty there and/or we have a physician leader that is not as team-oriented they just quickly slip back into the medical model of this is how we do it and you all just happen to be here" (Faculty Clinician).*

*" It can get bossy sometimes with these third and fourth-year medical students telling everyone what to do" (Student Leader).*

*"Some of the senior students from the medical school seem to feel they have to perform to the hierarchy " (Student Leader).*

### **Mechanism reasoning – Unwanted and disrespected**

When faculty clinician and senior student mentors acted in a manner that reflects a hierarchical approach, or professional dominance (Context), the student volunteers from the non-dominant professions described feeling marginalized and excluded. They believed their capacity to contribute to the encounter had been unfairly limited by the dominant profession, their input, opinions, and ideas didn't matter and their contribution and their profession were unwanted and disrespected (mechanism – reasoning). Such encounters were reported to reinforce negative stereotypes student volunteers may hold of the dominant profession (medicine).

*"Well there's always been a hierarchy in medicine, the physician always thinks they are automatically head of the team, the leader" (Student Clinic Manager).*

*" There's still kind of a hierarchical thought process, with medical students thinking they are at the top and then everyone else below on some level" (Student Leader).*

*And a comment from a student leader about comments they overheard from students who experienced a hierarchical approach being role modelled during their work in the clinic:*

*"You know med students are so stuck up and the doctors are so stuck up. It's all about them. Our ideas don't matter" (Student Leader).*

Study participants described how such experiences reduced student confidence particularly in speaking up and sharing opinions and potentiated the development of a 'them and us' mentality. They believed this led students to limit their future engagement with the dominant profession in the clinic.

*"When it's too focussed on medicine, and it's a hierarchy thing, you have to fight to get in there to give your interprofessional opinion" (Student Volunteer).*

A student clinic manager talking about an experience when they observed students trying to speak up stated:

*"They just kept getting shot down. There was just one boss with different professions being worker bees for that one person. You could see everyone clam up, stop contributing" (Student Clinic Manager).*

And from another clinic manager:

*When you feel like you don't matter, that your ideas and your profession aren't important, aren't respected by them then why bother to try to work with them" (Student Clinic Manager).*

### 5.1.3. IP primary care CMO theory 5: That seeks to explain how repeated participation in the Interprofessional primary care teams leads to changes in student volunteers collaborative and communication behaviours

**Box 5: IP primary care team CMO theory 5**

Resource	+	Context	=>	Reasoning	=	Outcome
Repeated participation as a volunteer on an IP primary care team		<b>Equal Status</b> <b>Confidence</b>		This is a safe place to speak up and share my ideas		Changes in collaborative and communication behaviours

When students are provided with repeated opportunities to participate on an IP primary care team (mechanism resource) the interviewees reported associated changes in student collaborative and communication behaviours (outcome). Two contextual elements, equal status, and confidence, were identified as impacting the achievement of these outcomes.

#### **Context - Equal status**

Interviewees believed that students who continue to volunteer on the IP primary care teams throughout the year possess a sense of a shared equal status with their peers. Developed during their early volunteer experiences and facilitated by repeated exposure to positive collaborative role models (see CMO3) these volunteers were thought to bring this sense of equal status to their later volunteer experiences.

#### **Context - Confidence**

Interviewees also believed early experiences in the IP primary care teams resulted in these students developing confidence in themselves and in their abilities to contribute to patients and to the clinic (an outcome of CMO3), which they also brought into their later volunteer experiences.

#### **Mechanism reasoning – A safe place to speak up and share my ideas and opinions**

Study participants reported that when students had the opportunity to repeatedly volunteer (mechanism resource) they came to view the clinic as a safe place to speak up and share their ideas and opinions (mechanism reasoning). A sense of equal status with their peers (context), and confidence in themselves and their abilities (context) were reported to support changes in their collaborative and communication behaviours (outcomes).

#### **Changes in student's communication behaviours**

Speaking up to share opinions, voice concerns, and advocate for the patient

Both students and faculty clinicians stated that when volunteers see the clinic as a safe place to speak up, where their ideas and opinions are sought out, wanted, valued, and where their contributions matter, they increasingly do so, as demonstrated in the following quotes:

*"I was so comfortable sharing my ideas with the group"* (Student Volunteer).

*"My opinions were important to the discussion, to the team"* (Student Clinic Manager).

#### Advocating for the patient

Viewing the clinic as a safe place to speak up, they are comfortable raising issues, challenging ideas, and speaking up to advocate for what they think is important to the patients (outcome) as highlighted in the following extracts:

*"They're comfortable raising issues, maybe putting a different spin on things, you know? What they think might be the right thing for this patient. Challenging decisions they don't think are right for them"* (Student Clinic Manager).

*"I guess it's being comfortable challenging ideas you think won't be good for the patient. Speaking up for their best interest, the patients. Offering up other suggestions and ideas"* (Student Volunteer).

#### **Changes in student's collaborative behaviours**

##### Increased comfort in taking a leadership role in the team

Students were also reported to take on more of a leadership role in the team, for example, leading the presentation of the patient assessment to the faculty clinicians or leading team discussions. The following comment comes from a student clinic manager about their experience as a volunteer:

*"After some time in the clinic, I stepped up to lead more during the assessment and the presentation. I felt secure doing that, confident, because I knew everyone would be OK with it"* (Student Clinic Manager).

And from a faculty clinician speaking about their observations of regular volunteers in the IP primary care teams:

*"I have seen the students start to lead more, to be comfortable doing that. They come to feel safe doing that here"* (Faculty Clinician).

##### Actively seeking opportunities to collaborate with other professions

Students were also confident engaging with students and faculty clinicians from other professions, especially medicine, and sought out increased opportunities to collaborate with the other professions (outcome). A medical and pharmacy student described their volunteer experience as follows:

*"When I was on the team, the PA student knew way more than I did, the pharmacy student knew so much more about the medications than me. So I think, I learned, how much I need to use those resources to really seek out their knowledge and ideas"* (Student Leader).

*"I think I was intimidated by the medical students until I really got to work with them in the clinic. Now I am so comfortable working with them, I really seek them out now to talk to, get their ideas, and share mine with them"* (Student Clinic Manager).

## Section 5.2 – Programme theories that seek to explain how the interprofessional student leadership team works

### Introduction

This section presents the CMO theories that seek to explain how the interprofessional student leadership team works. Six CMO theories were developed that seek to explain what happened to students who participated in the interprofessional student leadership team (see Table 19).

The student leadership team involves serving on the IP panel or executive officers board (EOB) for a period of at least one year. Activities include attendance at weekly, bi-weekly, and or monthly board and panel meetings, volunteering in the clinic on a regular basis, additional meetings with university and clinic administrators, and time spent developing collaborative relationships with outside organizations including potential sponsors and donors. It involves a large workload and time commitment for student leaders and is the longest and most intensive interprofessional experience for students within the clinic. The findings for the structure and function of the executive board and panel were described in chapter 4.

### 5.2.1. IP student leadership CMO theory 1: Which seeks to explain how student clinic leaders commit to shared clinic goals

**Box 6:** Student leadership CMO theory 1

Resource	+	Context	=>	Reasoning	=	Outcome
Serving as a student leader on the IP panel or EOB		Valuing their experience as a clinic volunteer		The student leaders believe that they are engaged in important and valuable work		Student leaders commit to the shared goals of the clinic and contribute the necessary time and resources to work together to achieve these goals
		A shared philanthropic desire to help uninsured and underserved members of the local community				

Student and faculty interviewees reported students provided with the opportunity to serve as leaders on the panel or EOB (mechanism resource) committed to the shared goals of the clinic and to contributing the necessary time and resources to work together to achieve these goals (outcome). Two contexts were identified as contributing to the attainment of this

outcome, valuing their experience as a clinic volunteer, and a philanthropic desire to help uninsured and underserved members of the local community.

### **Context – Valuing their experiences as a clinic volunteer**

Interviewees identified their experience as a student volunteers as influential in motivating them to apply for clinic leadership positions. Positive volunteer experiences led them to believe their participation mattered and had made a difference to patients, and they viewed the clinic as a valuable experience. Valuing the experience led them to desire to do more and to apply for a leadership position as stated in the following statements from student leaders.

*“ When I was a volunteer, it made such an impression on me. I had to come back I wanted to do more for these patients” (Student Leader).*

*“I wanted to join the panel because I thought I could make more of a difference. I wanted to do more, make even more of a difference” (Student Leader).*

*“As a volunteer, I helped some patients, it felt great you know, to make a difference. I guess I just wanted to be able to do even more” (Student Leader).*

### **Context – A shared philanthropic desire**

Student leaders described being motivated by a strong desire to help the uninsured and underserved members of their local community who lack adequate access to healthcare. This philanthropic motivation led students to take clinic leadership roles believing they could help make the clinic work with the ultimate aim of ensuring clinic patients gained access to quality care. This shared philanthropic desire was identified as an important context in students committing to the clinic goals and to the necessary work to achieve them (outcomes).

*“ As clinic leaders, we are really working together trying to look at the underserved needs of this population we are serving” (Student Leader).*

*“ We are all here and we put the work in because we are all committed to serving this population, the underserved right here in this community, our community. I felt I could do more as a clinic leader to make that happen” (Student Leader).*

### **Mechanism reasoning - Important and valuable work**

Student leaders believed they were engaged in important and valuable work (mechanism reasoning) that directly impacts patients. Helping meet an important need for members of their local community who do not have access to affordable healthcare and for whom the clinic may be the only option. They wished to do more to ensure they had access to high-quality care and as a result, they committed to working together on the clinic's shared goals. The belief in the importance of the work motivated student leaders to commit the necessary time to the clinic and they viewed it as an important use of their time.

*“We serve a really important need for people in this community. This clinic is one of several, but not enough, free clinics for a very needy population” (Student Leader).*

**Table 19:** CMO Theories for the student leadership team

CMO	Resource	+	Context	→	Reasoning	=	Outcome
1	The opportunity to serve as a student leader on the IP panel or EOB		<ul style="list-style-type: none"> <li>Valuing their experience as a clinic volunteer</li> <li>A shared philanthropic desire to help uninsured and underserved members of the local community</li> </ul>		Important and valuable work		A commitment to achieving shared goals
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
2	The shared experience of the management and leadership of the interprofessional SRC		<ul style="list-style-type: none"> <li>A commitment to shared goals</li> </ul>		High stakes work		Team formation Team mentality
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
3	Engaged in shared problem solving and shared decision-making as a student clinic leadership team		<ul style="list-style-type: none"> <li>Shared goals and values</li> <li>Equal Status</li> </ul>		Trust and respect		The development of a shared team identity
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
4	Prolonged exposure to working in a stable IP student leadership team		<ul style="list-style-type: none"> <li>Equal status</li> <li>Trust</li> <li>A shared team identity</li> </ul>		Shared accountability, responsibility, and reliance		Team cohesion
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
5	Prolonged participation in a stable interprofessional team		<ul style="list-style-type: none"> <li>Confidence to approach other professions</li> </ul>		I have the attitude and skills to be effective		Actively seek out future opportunities for IP collaborative teamwork
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
6	Prolonged participation in a stable IP team		<ul style="list-style-type: none"> <li>Students from professions with less representation</li> </ul>		My work reflects on my profession		Increased understanding of the capabilities of and respect for underrepresented professions

*“We are sharing our knowledge and expertise with a community who can’t afford care, who don’t have any access other than the emergency room. It’s important and we work together for them to give them access to good care” (Student Leader).*

*“ We are all here for the right reasons, to help these patients in every way we can and give them the best care that we can” (Student Leader).*

### 5.2.2. IP student leadership CMO theory 2: Which seeks to explain how participation in the IP leadership experience results in team formation and a development of a team mentality

**Box 7: Student leadership CMO theory 2**

Resource	+	Context	=>	Reasoning	=	Outcome
The shared experience of the management and leadership of the interprofessional SRC.		A commitment to shared goals		This is high stakes work		Team formation and the adoption of a team mentality

Participation in the shared experience of the management and leadership of the IP SRC (mechanism resource) was reported to result in team formation and the adoption of a team mentality (outcomes).

*“ Leading the clinic really pulls us all together, you know? We are all aiming for the same thing, we are working together, as one, as a team to do the best we can for the patients coming here” (Student Leader).*

#### **Context – A Commitment to shared goals**

As illustrated in the last transcript extract, the student leaders have buy-in and are committed to the clinic’s shared goals and to working together to achieve them. This commitment was identified as an important context for team formation and development of a shared team mentality.

#### **Mechanism reasoning - High stakes work**

Student leaders, particularly those on the executive board, believed their work was high stakes (mechanism reasoning). That they were dealing with important issues that had significant implications for the ability of the clinic to function, for its success, its legal status, and the quality of patient care. Their work included the recruitment and preparation of volunteer faculty clinicians, ensuring they met the regulatory supervision requirements for the various professions in the clinic. They were also responsible for ensuring the scheduling of sufficient numbers of faculty clinicians for each clinic session, for ensuring the clinic adhered to important legal requirements e.g. OSHA and HIPPA and for securing the safety of both patients and volunteers.



The high stakes nature of this work was suggested to necessitate and motivate student leaders to work closely together supporting team formation and the development of a shared team mentality (outcome) as described in the following transcript extracts.

*“ This work is so important. Without this clinic, these patients don't have many options. So we need to get it right, the stakes are pretty high for us and for them”* (Student Leader).

*“ If we get it wrong, if we mess up it's going to have a big impact on these people, on our community who don't have insurance. So we have to work together, to get it right, for them. We have to be on the same page, to work as a team”* (Student Leader).

### 5.2.3. IP student leadership CMO theory 3: Which seeks to explain how engaging in shared problem solving and decision making as an interprofessional student leadership team builds trust and respect resulting in the development of a shared team identity

**Box 8:** Student leadership CMO theory 3

Resource	+	Context	=>	Reasoning	=	Outcome
Engaging as a team in shared problem solving and shared decision-making		Commitment to shared goals and values Equal Status		Trust and respect		Developing a shared team identity

It was evident from both the interview data and analysis of the minutes of the executive board and panel meetings, that the student leaders were frequently engaged in shared problem solving and shared decision-making (mechanism resource). Faculty clinicians and student leaders believed participation in these shared activities led to the development of a shared team identity (outcomes). They described student leaders moving from a focus on ‘what I bring to the experience’ to ‘what we bring’. From ‘what I can achieve’ to ‘what we can achieve together’.

*“ We get so much more done together when we work on problems together and try to resolve them together”* (Student Leader).

*“ I am so glad to be a part of the clinic leadership, it's a great team, it's all about what we can and do achieve together”* (Student Leader).

Student leaders described resolving clinic problems through the process of shared problem solving. This involved sharing the problem with the team, discussing ideas for resolutions and working together to come to a consensus through shared decision making. The analysis of the minutes from the executive board and panel meetings proved to be a rich source of examples of shared problem solving and shared decision making by the student leadership team. They tackled many issues together for example liability, financing the

clinic, the non-profit status of the clinic, patient transportation, access to and use of the electronic medical record system, securing pharmaceutical supplies, access to lab tests and x-rays, the recruitment of faculty clinicians, and patient safety as described in the following transcript extract.

*“ We had a patient come in and the patient was having a heart attack. We weren’t really prepared for that. How can we better prepare ourselves for the next time? So at our meetings, we talked about all the issues together, of how we could address them, making decisions together on how to move forward. Creating a shared policy for the clinic and a plan for how to put it in place” (Student Leader).*

Two particular contexts were identified as necessary the development of a shared team identity, shared goals and values and equal status.

### **Context - Shared goals and values**

Student leaders and faculty clinicians both stated that commitment to the shared goals of the team was necessary for the leadership team to engage in effective shared problem solving and decision making. Student leaders described the nature of their IP engagement on the board or panel in terms of a shared experience founded on the shared goal of making the clinic work for all involved (patients, students, faculty, and the university).

Requiring a commitment to actively working together to resolve problems.

*“The big thing is that we’re all committed to this, to the clinic. To what it stands for, what we’re trying to do. And so we all roll up our sleeves and work at it together” (Student Leader).*

### **Context – Equal status**

Student leaders believed the development of shared team identity was dependent on the belief that all members of the team have an important and equal part to play in the success of the clinic. That all team members make important contributions, that all of their contributions matter, and matter equally to the functioning and effectiveness of the team and of the clinic. Articulated by a student leader as follows.

*“ There’s no hierarchy in this, no-one’s better, no top dogs, it’s even. We all have a say, a voice. We all count” (Student Leader).*

### **Mechanism reasoning – Trust and respect**

By repeatedly engaging in shared problem solving and shared decision-making student leaders were reported to develop trust and respect for their fellow leaders from other professions (mechanism reasoning) as described in the following extracts.

*“I trust and respect my team members, and what they bring to the problems we are dealing with in the clinic” (Student Leader).*

*“We develop such trust and respect for each other” (Student Leader).*

*“I know my teammates seek out my input, my ideas, and I know they respect and trust me and what I can offer” (Student Leader).*

Interviewees described a shift in the language and thinking of student leaders from me, my contribution matters, to us, and our contribution matters:

*“When I was a volunteer I was always thinking about what I can bring, what I can do? But when I got involved in the leadership team for the clinic, it was about us, what we could do together to improve the clinic, make a better experience for the patients” (Student Leader).*

*“It works because we do it together, I guess it’s like that expression, it takes a village” (Student Leader).*

*“Working together really makes the difference. We trust each other. We get more done. We work better when we all pull together” (Student Leader).*

They feel respected and valued by their fellow leaders and respect them in return. They believe their team contribution matters and they achieve better results when they work together to resolve issues.

*“When someone brings a problem in the clinic to the board meeting, we all get a chance to talk it through. Thinking together about what caused it, how we might fix it” (Student Leader).*

*“I think we get to better answers because we work together. Sometimes people bring up ideas I would never have thought of. I trust their ideas and I think we are better, the clinic is better because we work to come to an answer together” (Clinic Manager).*

When student leaders respect and trust one another and feel they can rely on one other they begin to form a shared team identity as exemplified by a faculty clinician in the following extract.

*“You can really see the team forming, these student leaders coming together, collaborating, working together, solving some pretty difficult problems together” (Faculty Clinician).*

#### 5.2.4. IP student leadership CMO theory 4: Which seeks to explain how prolonged exposure to working in a stable Interprofessional student leadership team results in enhanced team working and team cohesion

**Box 9:** Student leadership CMO theory 4

Resource	+	Context	=>	Reasoning	=	Outcome
Prolonged exposure to working in a stable IP student leadership team		Equal status		Shared accountability, and responsibility		Enhanced team working
		Trust		Reliance and interdependence		Team cohesion
		A shared team identity				

As student leaders continue their participation in the panel or EOB they experience prolonged exposure (one year or more) to working in an IP team with stable membership (mechanism resource). The faculty clinicians and student leaders described this prolonged team experience as enhancing teamwork and generating team cohesion (outcomes).

*“ I get to work with this team of people for a whole year, so you really get to know each other, you gel together, rely on each other. We have to, to make the clinic work” (Student Leader).*

To achieve these outcomes the following contexts were thought to be required, student leaders perceive one another as equals, mutual trust, and a shared team identity.

### **Context – Equal status and trust**

When students share responsibility for leadership of the clinic and see each other as equals, as equally responsible for the required work to make the clinic function, for the success or failure of the clinic, they trust that others on the team will do what needs to be done and will meet their obligations.

### **Context – A shared team identity**

Student leaders needed to have developed a shared identity as the student leadership team rather than seeing themselves as individuals representing their profession. A student leader stated this as follows.

*“ We know we are all in this together, it takes the team to all pull together. That’s the only way it works” (Student Leader).*

### **Mechanism reasoning - Shared accountability, responsibility, reliance, and interdependence**

As equals, they trust that others on the team will do what needs to be done. Trust opens the door for students to feel comfortable relying on one another. They hold that their teammates will do what needs to be done, will meet their responsibilities because they are committed to the clinic’s goals and the patients it serves. Student leaders share the responsibility for the clinic, viewing one another as equally responsible for its successes and failures and taking on shared accountability for both. Student leaders developed a healthy reliance on one another and interdependence as they share the responsibility and accountability for the clinic. Strengthening the bond between team members and enhancing team cohesion (outcomes) as illustrated in the following interaction between the interviewer and a student leader.

Student Leader: *“ It’s on all of us in the team, the responsibility to make this a success, to tackle the problems we come across. Tackle them together. We’re all pretty tightly connected now, you know? We know each other as friends. There’s trust there. I guess the best way to say it is we’re a real team”.*

Researcher: *“A real team?”*

Student Leader: You know, not just people who work in the same place. A real team. You know connected, really connected”.

### 5.2.5. IP student leadership CMO theory 5: Which seeks to explain how the interprofessional student leadership experience leads students to actively seek out future opportunities for interprofessional collaborative teamwork

The student leadership experience represents prolonged engagement in a stable IP team (mechanism resource) leading student leaders to actively seek out opportunities to engage in collaborative team working during their clinical practice rotations and include the possible availability of such opportunities in their decision making regarding future employment options (outcome). This outcome was thought to be dependent upon the student's confidence in approaching and collaborating with other professions.

**Box 10:** Student leadership CMO theory 5

Resource	+	Context	=>	Reasoning	=	Outcome
Prolonged participation in a stable IP team		Confidence to share their ideas and to approach other professions		I have the attitude and skills to serve as an effective member of an IP team		Actively seek out future opportunities for IP collaborative teamwork

#### **Context – Confidence to approach other professions**

Having confidence in themselves and not be intimidated to share their ideas or seek the opinions of students or faculty from other professions was identified as an important context. Comparing their experience as a student to that of the student clinic leaders, faculty clinician from nursing stated:

*“I remember being so intimidated approaching the physicians but these students have been doing it in the clinic right from the beginning of their training. So they have so much more confidence making a call or approaching them”* (Faculty Clinician).

And from another faculty clinician:

*“ I think it matters that these students are so confident approaching the other professions, they get that experience here in the clinic. They aren't afraid to share their opinions or ask others for theirs”* (Faculty Clinician).

#### **Mechanism reasoning – I have the attitude and skills to be an effective member of an IP team**

Students who participated in the IP student leadership experience (mechanism resource) reasoned they had developed the necessary team orientation and team skills to function as effective members of an IP team (mechanism reasoning). The following quotations come from student leaders who had completed some, or all, of their programme specific clinical rotations. They described how the student leadership experience led them to actively seek out collaborative opportunities during their clinical rotations (outcome).

*“ It was such an advantage when I was on my clinicals. I was confident speaking to other professions, you know asking for their opinions, going to case conferences or doing rounds. I really looked out for the chances to do that” (Student Leader).*

*“ I took every opportunity I could to go work with other professions, to really collaborate on my placements and I felt confident to do that because I had the experience of being a leader in the clinic” (Student Leader)*

Faculty clinicians reported receiving feedback from clinical rotation supervisors regarding the collaborative team skills of student leaders and their active attempts to take advantage of IP collaborative opportunities during their clinical placements.

*“ We hear such good things about these students, you know the leaders that have really worked together to get the clinic up and running. We hear from their preceptors about how confident they are working with other professions. That they keep asking, what else can I do, can I talk to this person, can I go to that meeting?” (Faculty Clinician)*

Senior students who served on the panel and executive board during the early years of their professional programme reported the presence of a collaborative environment and the availability of opportunities for IP teamwork had become important criteria when judging options for their first clinical job (outcome).

*“It’s so important to me now, to have that opportunity to work in a team. I prefer to work this way and so I’m looking for it now, as I’m looking at my options for a job” (Student Panel Leader).*

*“It’s definitely up there on my list of things I’m looking for when I am thinking about my first job. It’s really important to me, the teamwork, working with other professions” (Student EOB Leader).*

#### 5.2.6. IP student leadership CMO theory 6: Which seeks to explain how the presence of students from underrepresented professions in the interprofessional student leadership team increases understanding of the capabilities of and respect for their profession

**Box 11:** Student leadership CMO theory 6

Resource	+	Context	=>	Reasoning	=	Outcome
Prolonged participation in a stable IP team		Students from professions with less representation on the panel and EOB		My work reflects on my profession The high quality of my work in the leadership of the clinic allows students from the other professions to see what my profession is capable of.		Increased respect for and understanding of the capabilities of their profession

Participation as members of the IP student leadership team (mechanism resource) for students from professions with less representation on the panel and EOB (context) was reported to result in increased respect and understanding of the capabilities of their profession (outcomes).

### **Context – Students from professions with less representation on the panel and EOB**

It was evident from analysis of the minutes of the EOB and panel meetings that although the student leadership had attempted to ensure proportional representation of the professions this goal had not been achieved. As a result, some professions had limited representation on the panel and EOB. Documenting their approach to forming the panel and board membership the minute's state:

*"We need to get student involvement in the clinic through proportional representation"* (Panel and EOB Meeting Minutes 2/28/13)

*"How many representatives will we need for each school to be representative?"* (Panel and EOB Meeting Minutes 4/14/13)

And from a student leader on the EOB:

*"Most of the reps, maybe half, come from medicine. So some professions have limited representation on the panel and on the board. We need to fix this, to make it more representative"* (Student Leader).

### **Mechanism reasoning – My work reflects on my profession**

Students from professions with less representation on the panel and board believed the quality of their work on the leadership team reflected the capabilities of not only themselves but also of their profession. They described how the experience provided an opportunity to showcase their profession by demonstrating the high quality of their work in the management and leadership of the clinic. Providing the opportunity for other professions to see both their individual value to the team and the value of their profession. Providing insight into the capabilities of their profession (mechanism reasoning). They believe demonstrating the quality of their work in clinic management and leadership (non-profession specific tasks) would allow students from other professions to see their profession as intelligent, capable, and equal, increasing the respect for both them and their profession (outcome).

*"They get to see what we are capable of, that we can do really good work on the leadership team. I think that makes them see our profession in a new light, more as equals"* (Physical Therapy Student Leader).

*"I think they have a limited view of who we are and what we do. Maybe they think of undergrad psych courses, not what I can do as a Doctor of Psychology. I think being in this leadership role lets them see me as highly capable, well educated, intelligent. Maybe this builds more respect for my profession"* (Psychology Student Leader).

## 5.3. Programme theories that seek to explain how the specialty clinics works

### Introduction

This section presents the findings for the specialty clinics, which included profession-specific clinics for physical therapy, psychology, and podiatry, and clinics offering opportunities for students from multiple professions in ophthalmology, diabetes education, and women's health. Five CMO theories were developed for the specialty clinics (see Table 20) addressing observation and shadowing, on-site consultation, the profession-specific clinics, and the clinics open to students from multiple professions.

The specialty clinics functioned on a referral basis with referrals coming from the IP primary care teams, another pro bono clinics in the area, and the county hospital system. Speaking about the specialty clinics, a faculty clinician from the primary care team area stated:

*"They have their separate area that they see patients in. We have sent patients from the clinic to them to follow up on, like another day, if it's a physical therapy issue. Psychology, we do refer patients over to psychology, also ophthalmology. So we refer patients over to those areas"* (Faculty Clinician).

The clinics were all located on the same floor of the building, with the exception of the physical therapy clinic, which operated out of the basement. The EOB minutes described how profession specific clinics were introduced on a uni-professional basis and once established attempts were then made to introduce IP opportunities. At the time of this study, the diabetes and women's health clinics were not operating due to a shortage of faculty clinicians.

Students who worked in the specialty clinics stated this environment provided little or no opportunity for them to engage in interprofessional collaboration. The available IP opportunities included observation or shadowing, and on-site consultation to the primary care teams.



**Table 20:** Specialty clinic CMO theories

CMO	Resource	+	Context	→	Reasoning	=	Outcome
1	Observation or shadowing in a profession specific specialty clinic		<ul style="list-style-type: none"> <li>Students who observe</li> <li>Observation of the assessment and treatment of multiple patients</li> </ul>		Knowing what they do, and how they do it		Challenged stereotypes An expanded view of care beyond the observers own profession
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
2	Observation and shadowing in a profession specific specialty clinic		<ul style="list-style-type: none"> <li>Students being observed</li> <li>Senior students leading the observation experience and taking responsibility for representing their profession</li> </ul>		See that my profession as knowledgeable, skilled, impactful, and professional Respect my profession		Elevates the status of the observed profession to an equal footing with the other in the IP SRC
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
3	On-site specialty consultations to the IP primary care teams		<ul style="list-style-type: none"> <li>Consultations provided by senior students or faculty clinicians</li> <li>Confidence representing the profession</li> </ul>		More of an expert		Increased respect for my profession
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
4	Volunteering in a specialty clinic within an IP SRC		<ul style="list-style-type: none"> <li>A lack of IP opportunities</li> <li>Unsuccessful efforts to engage in IP efforts</li> </ul>		Outsiders with a different set of unique skills		Increasingly uni-professionally focussed
	<b>Resource</b>	<b>+</b>	<b>Context</b>	<b>→</b>	<b>Reasoning</b>	<b>=</b>	<b>Outcome</b>
5	The opportunity to apply to participate in an IP specialty clinic		<ul style="list-style-type: none"> <li>Limited volunteer opportunities and high demand</li> <li>A selection process based upon the judgement of the value of the experience to the different professions</li> </ul>		Perceived inequity		Cessation of attempts to participate in interprofessional activities within the SRC

### 5.3.1. Specialty clinic CMO theory 1: Which seeks to explain how observing or shadowing in a profession-specific specialty clinic challenges stereotypes and expands the observers view of care beyond their own profession

**Box 12:** Specialty clinic CMO theory 1

Resource	+	Context	=>	Reasoning	=	Outcome
Observation or shadowing in a profession specific specialty clinic		Observation of the assessment and treatment of multiple patients		Increased knowledge of the observed profession by seeing what they do, and how they do it. Challenges preconception - it's not what I thought, it's more than I thought, I can see their perspective		Challenged stereotypes  An expanded view of care beyond the observers own profession

This experience involved students from the primary care teams observing students in the physical therapy clinic or shadowing a student in the psychology clinic (mechanism resource). It represents an additional IP opportunity for students from the primary care teams, and an opportunity for specialty clinic students to showcase their profession. Two outcomes challenged stereotypes and developing an expanded view of patient care beyond their own profession, were reported for students who observed or shadowed. The opportunity to observe the assessment and treatment of multiple patients who presented with a variety of conditions and problems was identified as an important context in achieving these outcomes.

#### **Context – Observation of the assessment and treatment of multiple patients**

This was thought to provide the opportunity to observe the application of a wider range of knowledge and skills providing a broader view of how the observed profession works.

*“ They need to see us with more patients, to see the variety involved in our work. To see the breadth involved in our work with people”* (Student Leader from Psychology).

*“ I think it only works when they get to see our work with different patients. They see how we work on different issues and problem, beyond what they expected to see”* (Student Volunteer from Physical Therapy).

#### **Mechanism reasoning - Knowing what they do, and how they do it**

Interviewees believed students who observed the treatment of a variety of patients see what the profession does; including how they conduct assessments, the assessment tools they use, their clinical reasoning process, the types of skills they apply and the various treatments involved in their professional care. Interviewees who experienced such

observation or shadowing reported this exposure as increasing their knowledge of the observed profession, of what they do, but also of how they approach their work, how they interact with patients. They reported gaining an understanding of the unique perspective of the observed profession (mechanism reasoning).

Medical students who observed in physical therapy stated:

*"It's so easy to write a referral and say, oh just go to physical therapy. But seeing those interactions, you know what's going on at those sessions, you see how a physical therapist approaches the problem and how they interact with patients"* (Medical Student Volunteer).

*"Seeing a physical therapist interact with patients, which is so different than for us in medicine. They really take time with the patients. They are very thorough, and they have a whole range of tests to help with differential diagnosis"* (Medical Student Volunteer).

A medical student who observed in psychology stated:

*"You get to see, not only what they actually do, but how they do it. They have different ways of working with patients. Like in an assessment, they ask different questions, do different tests, but it's also how they ask them"* (Medical Student Leader).

And from a PA student who observed in physical therapy:

*"They are coming from a different place, a different perspective, and you only get to see that when you see them working with patients. It was so eye-opening to me"* (PA Student Volunteer).

The students who had been observed believed many of the students from other professions knew little about their profession and held stereotypical preconceived notions about what their profession did and what was involved in their patient care. They believed demonstrating the knowledge and skills of their profession increased the observer's knowledge of their profession and challenged their preconceptions and stereotypes (outcome).

An observer stated the following about physical therapy:

*"I had such stereotypes about what they did. Boy was I wrong. It's so much bigger and better than I had thought. I had such a limited view of what they can do. I feel bad about it when I look back on it now. But now I can see how much they can do for patients"* (Student Leader).

The following extract presents an interaction between the researcher and a student leader from medicine that observed a patient's course of treatment in psychology.

Student Observer: *"Oh my, it was so different than I expected. I guess all I knew about psychology was from TV. I expected the patient to lie down on a couch and spill the beans about how they were feeling, and the psychologist would sit with a notebook, looking serious, and taking notes. I was so wrong."*

Researcher: *"So what did you see?"*

Student observer: *"All the work they put in to build, I guess you would call it rapport, a connection, so the person could trust them. How that opened the door for them to start to guide, yes guide them from there"* (Student Leader).

And from a physical therapy student who was observed:

*"They get to see that we are more than the stereotype, more than a gym where we just make people do exercises"* (Physical Therapy Student Volunteer).

Those who had the opportunity to observe in a specialty clinic also described how the experience expanded their view of what is involved in patient care (outcome). A student leader from medicine who had the opportunity to observe and shadow in the specialty clinics describe the impact as follows:

*"It was such a great learning opportunity. I was so focussed on medical school I'm only supposed to be in this realm, this little box. But you get to see the other side, a different side of healthcare. See that there's care beyond the doctor's office that has to take place, in physical therapy, or psychology. There's much more than me and what I do" (Student Leader).*

### 5.3.2. Specialty clinic CMO theory 2: Which seeks to explain how being observed or shadowed in a profession specific specialty clinic elevates the status of the profession being observed

**Box 13:** Specialty clinic CMO theory 2

Resource	+	Context	=>	Reasoning	=	Outcome
Being observation or shadowed in a profession specific specialty clinic		Senior students leading the observation experience who take responsibility for representing their profession		Students from other professions see that my profession is knowledgeable, skilled, impactful, and professional and they come to respect me and my profession		Elevates the status of the observed profession to an equal footing with other professions

The students and faculty clinicians who worked in the profession-specific specialty clinics (physical therapy and psychology) reported how being observed or shadowed by students from other professions (mechanism resource) had elevated the status of their profession (outcomes).

#### **Context – Senior students leading the observation experience who take responsibility for representing their profession**

From the perspective of the faculty clinicians and students', observation or shadowing required senior student participation as it involved taking responsibility for representing the profession as illustrated in the following transcript excerpts.

*" It needs senior students to take the lead in these observations. They know more as they have been out on their clinicals and can show the profession in a really good light. As seniors with more experience, they can show a lot more of what the profession can do" (Faculty Clinician).*

*" As a senior student, I can take on the role as a teacher, teach them what we do, about our approach to care, what we do for the patients" (Senior Physical Therapy Student).*

### **Mechanism reasoning – Seeing my profession as knowledgeable, skilled, impactful, and professional**

Faculty clinicians and students viewed observation and shadowing as important opportunities to showcase their professional knowledge and skills and to present their profession as knowledgeable, skilled, impactful and professional (mechanism reasoning). The following quotation from a physical therapy student who had been observed by medical students illustrates these issues.

*“ I think they come to see us as capable, professional. That what we do really does make a big difference to our patients”* (Physical Therapy Student leader).

And from a student leader in psychology:

*“ It’s a great opportunity for them to see what we actually do, that we are intelligent professionals. That our profession is just as good as theirs”* (Psychology Student Leader).

They believed observing their work elevates the view of both themselves and their profession in the eyes of students from other professions, develops respect for their professional knowledge and skills, and viewing them as important contributors to patient care. They believed this respect helped raise their profession to an equal footing, being seen as *‘just as good as’* the other clinic professions.

### **5.3.3. Specialty clinic CMO theory 3: Which seeks to explain how providing on-site specialty consultations to the IP primary care teams resulted in increased respect for the consulting profession**

**Box 14:** Specialty clinic CMO theory 3

Resource	+	Context	=>	Reasoning	=	Outcome
On-site specialty consultations to the IP primary care teams		Senior students or faculty clinicians Confident representing the profession		Senior students are more experienced and more expert		Increased respect for the consulting profession

A single CMO theory addressed the experience of senior students from the specialty clinics who provided on-site consultations to the IP primary care teams (mechanism resource). The onsite consultation involved students from the specialty clinics joining the primary care team on an as need basis. These encounters were ad-hoc in response to a need identified during the primary care team assessment. A medical faculty clinician speaking about the psychology clinic stated:

*“Sometimes we do have a patient that comes in and if it’s a psychiatric issue we will actually have the psychology attending or one of the senior psychology students come in when we see the patients, after the students present. So they will actually*

*come in with us and help coordinate the exam and care for the patient" (Faculty Clinician).*

And from a clinic manager speaking about psychology consults:

*"Sometimes we pull them into the visits with us if it's something where we know that they're going to have to see the patient. So they'll kind of give us an idea, should we have them follow up with them? Should we put them on medicine? You know, what should we do?" (Student Clinic Manager).*

Two influential contexts were identified, consultations needed to be provided by senior students with the confidence to represent their professions.

### **Context – Consultations provided by senior students**

Those seeking a consultation always stated they had a senior student provide the consultation as the primary care team was looking for advice and expertise; therefore, novice students were not involved in consulting.

*"It's always senior students or faculty that do the consults. That's important as it needs to be someone with the knowledge and experience to provide the advice we are looking for" (Clinic manager from the primary care team)*

### **Confidence in representing the profession**

Senior students who provided on-site consultations needed to be confident in their ability to represent their profession as highlighted in the following quotation.

*"You need to be confident, in what you know about the profession to do this, to properly represent our profession" (Psychology Student Leader)*

### **Mechanism reasoning – More of an expert**

Senior students from specialty clinics who felt confident representing their profession when providing a patient consultation to the IP primary care team reasoned that such consultations allowed students from other professions to see their professions contribution to patient care. These senior students have more knowledge and experience, including clinical experience than the novice students from the other professions represented in the interprofessional primary care teams. When novice students experience consultations with senior students from a different profession, who they view as more expert, they have an opportunity to see what that profession can add to the patient's care.

*"They are more advanced than us, know more, and they have been out on their clinicals. So we really do learn from them" (Student Volunteer on a primary care team).*

*"It's great when they share their expertise. Like when we have a patient and they come in from psychology to give us ideas about what we need to do for this patient. They are further in their training and have more to offer than the newer students on the teams" (Clinic Manager from a primary care team).*

These senior students reported feeling respected for the knowledge and skills they shared during the consultations and believed they had represented their profession in a positive manner. They held that such interactions helped build respect for their profession with the novice students in the IP primary care teams (outcome).

*“ You can see that they respect what we have to say, especially as we are a bit more senior. That they respect what I brought, what my profession added to the conversation, to the patient” (Psychology Student Leader).*

#### 5.3.4. Specialty clinic CMO theory 4: Which seeks to explain how a lack of IP opportunities in the specialty clinics leads them to become increasingly uni-professionally focussed

**Box 15:** Specialty clinic CMO theory 4

Resource	+	Context	=>	Reasoning	=	Outcome
Volunteering in a specialty clinic within an IP SRC		A lack of IP opportunities  Unsuccessful efforts to engage in IP efforts		Students feel marginalised, excluded, and different.		The students and the speciality clinic become increasingly uni-professionally focussed

Students who volunteered within the interprofessional SRC (mechanism resource) yet had no opportunities to work with students or faculty clinicians from other professions (context) described how this experience led them to view the speciality clinic as a place to develop their profession-specific knowledge and skills. As a profession specific clinic, that happens to be located within an SRC. This led the students and the speciality clinic to become increasingly uni-professionally focussed (outcome).

##### **Context - Lack of interprofessional opportunities**

An important context in achieving this outcome was identified as the lack of opportunities for students in profession-specific speciality clinics to work with students and faculty from other professions. This was despite the SRC having been promoted to them as an interprofessional clinic as voiced in the following statement from a physical therapy volunteer.

*“I had been told that I was signing up to join an interprofessional clinic. It may be for some people if you're from medicine, or PA maybe, but it's just not for us” (Physical Therapy Student volunteer).*

##### **Context - Unsuccessful efforts to engage interprofessionally**

Students and faculty clinicians identified unsuccessful efforts by students within the speciality clinics to engage on a more IP basis as an important context in leading students to become increasingly focussed on their own profession.

*“ Well we tried, I have been trying for over a year to get some interprofessional experience in the clinic. I have tried approaching the primary care teams, offering suggestions about how we can work together. It hasn't gone anywhere. Nothing has*

*changed. So we just do our own thing now"* (Clinic Manager in a specialty clinic area).

### **Mechanism reasoning – Outsiders with a different set of unique skills**

When students in the profession-specific specialty clinics were not provided with opportunities to engage in IP activities within the clinic (mechanism resource), they reported feeling marginalized and excluded, on the periphery of the clinic, that they were outsiders.

*"We aren't really a part of the clinic, they are all upstairs. I mean we are in the basement, that says it all"* (Physical Therapy Student Volunteer).

They describe feeling different, not equal to other students, and believed the other professions were disinterested in them or viewed them as being of lesser value to the clinic. Students from the speciality clinics described how they believe students on the primary care teams feel about them and their profession as follows:

*"I don't want to say not as good as, but kind of that idea"* (Student Specialty Clinic Volunteer).

*"They think we don't have as much to offer"* (Specialty Clinic Manager).

*"They just send their patients to us, but I don't think they even know what we do, or really care what we do. It's not that important to them"* (Specialty Clinic Student Leader).

The students in the specialty clinics came to regard their skill set as somehow too different, too unique, to integrate with the other professions and focus on developing their profession-specific skills with the support and mentorship of senior students and faculty clinicians from their own profession. As articulated in the following example quotes.

*"We are a bit separate just because we have a different skill set that it's not necessarily conducive to interprofessional, to the primary care teams and such"* (Student Specialty Clinic Leader).

*"Because the med students, podiatry students, don't have the skills that we have, they don't do a lot of hands-on treatment, so we are different"* (Student Physical Therapy Clinic Manager).

As a consequence, the speciality clinics became increasingly focussed on developing profession-specific knowledge and skills rather than developing interprofessional knowledge and skills.

When the students from the specialty clinic areas made efforts to engage on a more interprofessional basis and these efforts did not prove fruitful, this was reported as exacerbating the feeling of marginalization and difference. Students in the profession-specific specialty clinics disengaged with their efforts to join the IP teams and the specialty clinics became increasingly uni-professionally focused.

*"So I have been trying for nearly two years now, I have been really working on trying to bridge the gap between PT and the medical team upstairs. Just to get clinic managers up there. I have gotten, well nowhere really. So I put my efforts into my own area into the PT clinic"* (Physical Therapy Student Leader).



*"I have been trying to get them to understand, you know, what we do, that we even exist in the building" (Psychology Student Leader)*

*"When you keep on trying and you get nowhere, you give up. You start to focus on your own clinic, put your efforts into that, into your own profession" (Specialty Clinic Manager).*

### 5.3.5. Speciality clinic CMO theory 5: Which seeks to explain how not being selected to participate in an interprofessional specialty clinic team leads to perceptions of inequality and the cessation of attempts to participate in interprofessional activities within the clinic

**Box 16:** Specialty clinic CMO theory 5

Resource	+	Context	=>	Reasoning	=	Outcome
The opportunity to participate in an IP specialty clinic		High demand for limited spaces on the teams		Perceived inequity		Cessation of attempts to participate in interprofessional activities within the SRC
		A selection process based upon a judgement of the value of the experience to the different professions		Students who were not assigned to the team believed their IP opportunities were unfairly limited in preference for another profession.		

Several specialty clinics, ophthalmology, women's health, and the diabetes clinic, were described as being IP rather than profession-specific as they were open to students from different professions (mechanism resource). These clinics are not always operating, for example during the period of data collection for this study the women's health clinic and the diabetes clinic were not operating due to a lack of supervising faculty clinicians, and the ophthalmology clinic was operating on only one evening per month. While these clinics have limited openings for student volunteers the demand from students is high.

When students apply for a volunteer position within these clinics and are not selected, both students and faculty clinicians reported students ceasing their attempts to participate in IP activities within the clinic (outcome). The following quote comes from a faculty clinician.

*"I have seen students who didn't get into the specialty clinics, stop trying, stop trying to find or make chances to work with the other professions in the clinic" (Faculty Clinician).*

Two contextual elements were thought to shape this outcome, high demand and limited opportunities, and the use of a selection process based upon a judgement of the value of the experience to students from different professions.

### **Context – High demand and limited volunteer opportunities**

When there are a limited number of volunteer spots available for these IP specialty clinics yet the demand to participate is high, this created logistical problems for the student clinic managers, whose role is to allocate students to these teams, and presents challenges to their efforts to be interprofessional.

### **Context – A selection process based upon a judgement of the value of the experience to the different professions**

From the analysis of the interview transcripts and minutes from the EOB and panel meetings, it was evident the student leaders had discussed how to address the high demand for these limited opportunities. They developed a process by which the clinic managers made these decisions based upon the perceived relevance of the experience to students from different professions. The following excerpt from the EOB minutes and a quotation from a clinic manager speaking about the women's health clinic, illustrate the issues.

*"Ophthalmology volunteers. Limited volunteer opportunities. A delicate balance between creating IP opportunities and taking spots from students who might work in that area in the future. Clinic managers to judge on relevance to the profession"*  
(panel and EOB minutes 5/17/15).

*"It's always so challenging when we give those spots to a PA or medicine. People feel like those spots are taken away from them, which can sometimes upset people"*  
(Student Clinic Manager)

As a result of such judgments, students from some professions were excluded from the experience, while others were given priority.

### **Mechanism reasoning – Perceived inequity**

Priority was given to medicine, nursing, and physician assistants, as the experiences were thought to be more relevant for these professions, which also happened to be the professions in the IP primary care teams. Students from physical therapy, pharmacy, podiatry, and psychology, who had more limited IP opportunities within the clinic, were more regularly denied a volunteer spot as a result of these judgments on the relevance of the experience to their profession. These students perceived their IP opportunities as being unfairly limited in preference for other professions. They saw inequity in the decision-making process and reasoned that their profession was unfairly treated (mechanism reasoning). Such experiences were reported to lead students to cease efforts to engage interprofessionally within the clinic and become focussed on their own profession. The following transcript excerpt comes from an interview with a student who had attempted to acquire a volunteer spot in the women's health clinic:

Student Volunteer: *I tried to get into the women's health area. I thought it would be a great experience, a chance to work with other professions. But they umm, they didn't take me. They took medicine and PA students, but not me".*

Researcher: *"Do you have any thoughts on why they didn't take you?"*

Student Volunteer: *They said they had limited spots, and umm, that it wasn't as relevant for my profession".*

Researcher: *"What did that make you think?"*

Student Volunteer: *"Umm, that I wasn't as important. And, umm, they thought the other professions would do a better job, like better than me, than my profession. I don't know how they decided that when they don't even know what I could offer, what my profession could offer. We actually do a lot of work in women's health. I don't think it's fair. Ask me what I could bring first then decide. At least let me have a say. I won't be trying that again. I'm still going to go, but only to my own clinic"*  
(Student Volunteer).

## 5.4. Faculty clinician and student programme

### theories seeking to explain how the IP SRC works for patients?

Analysis of the clinic documents and transcripts revealed three categories used by the faculty clinicians and students who designed, delivered and experienced the clinic to describe how the clinic worked for patients. They believed patients received better quality care, more holistic care, and as a result, have better outcomes in the IP SRC than in a traditional care setting. Table 21 presents the outcomes identified within each of these categories.

**Table 21:** Categories and outcomes identified for patients by faculty clinicians and students

Outcome Category	Better Outcomes for Health and Well-Being	More Holistic Care	Better Quality Care
<b>Patient Outcomes</b>	<ul style="list-style-type: none"> <li>Increased satisfaction with the care experience</li> <li>Enhanced self-esteem</li> <li>Increased ability to engage in self-care leading to improved clinical outcomes</li> </ul>	<ul style="list-style-type: none"> <li>More needs identified</li> <li>More needs addressed</li> </ul>	<ul style="list-style-type: none"> <li>Increased access to care</li> <li>Better care coordination</li> <li>Enhanced patient safety</li> </ul>

Within the category of better patient outcomes for health and wellbeing, faculty clinicians and students attributed three outcomes to the IP nature of the clinic. These were, increased satisfaction with the care experience, enhanced self-esteem, and increased ability to engage in self-care leading to improved clinical outcomes. Within the category of holistic care, two interconnected outcomes were identified, patients were thought to have more of their needs identified during an IP team assessment and to have more of these needs addressed in the IP SRC. With respect to better care quality, the identified outcomes were increased access to care, better care coordination and enhanced patient safety. Eight CMO theories were developed from the perspective of faculty clinicians and students that seek to explain how the clinic works for patients (see Table 22). These are presented within each of the identified outcome categories.

**Table 22: Faculty Clinician and Student CMO Theories Relating to Patients**

CMO	Resource	+	Context	→	Reasoning	=	Outcome
1	IP team assessment		<ul style="list-style-type: none"> <li>• More time face-to-face with care providers</li> <li>• Communication quality</li> <li>• Language of the interaction</li> <li>• Genuine interest of novice students</li> </ul>		Interested in me		Increased satisfaction with the care experience
2	The opportunity for patients to play a role in the education of health professional students in an IP SRC		<ul style="list-style-type: none"> <li>• Patients from marginalized populations</li> <li>• Students engaging with and receptive to learning from patients</li> <li>• Role modelling patient engagement and participation</li> <li>• Language of the interaction</li> </ul>		I have value		Increased self-esteem
3	Health education from an IP team of students		<ul style="list-style-type: none"> <li>• Longer face-to-face interaction</li> <li>• Individualised health education</li> <li>• Students with sufficient knowledge of the patient's health condition</li> </ul>		Empowered and capable		Increased Engagement in self-care ↓ Improved clinical outcomes
4	An IP team assessment		<ul style="list-style-type: none"> <li>• Different professional perspectives</li> </ul>		Interested in me		More needs identified
5	More needs identified through an IP team assessment		<ul style="list-style-type: none"> <li>• Co-located services</li> <li>• Access to convenient, affordable, specialty care services and expert faculty</li> </ul>		Reducing the burden		More needs addressed
6	Shared IP team assessment and care planning		<ul style="list-style-type: none"> <li>• Co-location of services and providers</li> <li>• In-person hand-offs and transfers</li> <li>• Simultaneous first-hand information sharing</li> </ul>		More effective, more humanistic communication		Better care coordination (Reduced number and better quality hand-offs and transfers)
7	IP team assessment and care planning involving shared problem solving		<ul style="list-style-type: none"> <li>• A comfortable environment to raise safety concerns</li> </ul>		Multiple checkpoints		Improved patient safety through reduced errors
8	Safety concerns are raised in an IP team assessment and care planning		<ul style="list-style-type: none"> <li>• Co-location of multiple services and clinicians from different professions</li> </ul>		Immediate on-site response to issues		Improved patients safety Mitigated errors

### 5.4.1 Faculty clinician and student CMO theories addressing the better outcomes for health and well-being category

Three CMO theories were developed that seek to explain the outcomes within the better outcomes for health and well-being category. These address increased patient satisfaction, enhanced self-esteem, and increased ability to engage in self-care (outcomes).

#### 5.4.1.1. Patient CMO theory 1: Which seeks to explain how an assessment by an IP team may positively impact patient satisfaction with care in the IP SRC

**Box 17: Patient CMO theory 1**

Resource	+	Context	→	Reasoning	=	Outcome
Assessment by an IP team		<ul style="list-style-type: none"> <li>• More time face-to-face</li> <li>• Communication quality - a 2-way conversation</li> <li>• A shared language for the interaction</li> <li>• Novice students genuine interest in the patients</li> </ul>		They are genuinely interested in me and have my best interest at heart		Increased satisfaction with the care experience

Faculty clinicians and students believed assessment and care planning by an IP team (mechanism resource) resulted in patients being more satisfied with their care in the IP SRC (outcome) than in a traditional primary care clinic. Several contexts were identified that were believed to influence patient satisfaction, all but one were concerned with the quantity, quality, and nature of the interactions between patients and their care providers (students and faculty clinicians) and all related to communication. In particular, the time patients spend in face-to-face contact with their team of care providers, the quality of communication in those interactions, and the language in which they are conducted. The genuine interest of novice students' in the patients and what they have to say was also identified as an important contextual element.

#### **Context - More face-to-face time with care providers**

The interviewees associated increased patient satisfaction with the care experience with the opportunity the clinic provides for longer interactions between patients and their care providers. They believed patients in the clinic spend more time with their care providers than in a traditional primary care clinic appointment. Extended time spent in face-to-face interactions between patients and their care providers was thought to contribute to improved patient satisfaction as illustrated in the following transcript extract.

*"Because it's an interprofessional clinic, and we are seeing the patients as a team, they are in the clinic a long time. We get to spend much longer with them than in a regular doctors appointment. At least from my experience, that is. We spend more*

*time in the room with them, talking with them, getting to know and understand them”*  
(Student Leader).

### **Context - Communication quality**

The quality of the interaction between patients and their care providers was also identified as an important contextual factor in increasing patient satisfaction. When prompted to describe what was meant by better quality communication, a two-way conversation between patients and their care providers was identified as the underlying contextual element at play. The following interaction presents how a student leader in the clinic described this.

Student Leader: *“ We don’t just throw a set of questions at them, we really talk, you know, talk with them. We try to listen, to um, really listen to what they have to say. After all, it’s about them, not us. So we really try, try to have a proper conversation, not one sided where we just throw questions at them”.*

Researcher: *“And what might that make them think? ”*

Student Leader: *“That we really care about them. We want to hear what they have to say. I hope they would feel they can share whatever they need with us. That we’re open to that, we’re listening to what they have to say”.*

### **Context – The language of the interaction**

The language in which the conversations between patients and care providers takes place was identified as the linchpin in achieving good quality interactions and communication with patients. A student leader put it as follows:

*“We have translators in the clinic, and people who speak Spanish. We really need them, we do. Cause most of the patients speak Spanish, the ones that come to the clinic. It means we can actually speak with them. Talk, talk together. Not spend all the time trying to guess what they’re saying”* (Student Leader).

When patients and care providers communicate in the patient's primary language, or when patients have access to appropriate medical translation services, longer face-to-face interactions and better quality communication involving a two-way conversation become possible. Without this, optimal communication between patients and providers was not thought to be possible, with an expected negative impact on patient satisfaction with the encounter. A student volunteer speaking about the importance of language and the patient experience stated the following:

*“ I don’t know how we would do a good assessment or provide good care if we couldn’t speak the same language, or communicate through the translators. We would be guessing so much, probably missing a lot too. That just can’t be, can’t be a good experience for them”* (Student Volunteer).

### **Context - The genuine interest of novice students**

The presence of novice students on the team was considered to provide a unique contextual element. This experience is the first direct patient contact for students since joining their health professional programme. These novice students were thought to enter the clinic eager to engage with patients. They were considered to be genuinely interested in the patients, and eager to interact with them and hear what they had to say.

*“I’m interested in so much. What’s going on with the person, you know? It doesn’t necessarily have to just be the disorder but.... I don’t know. It’s easy to feel like*

*when I go into the doctor you know that it's just kinda like, I go in and I go out. But I think as students we're just like, really interested in them" (Student Volunteer).*

A faculty clinician contrasted this to the attitudes they sometimes see in colleagues who have been working for a long time, who may be experiencing some burn-out, and seem to just go through the motions.

*"I think its refreshing for the patients... that enthusiasm. The students are eager, involved, even excited by the patients. Sad to say, that might not be the case with some people that have been in practice a good long time. People can get burnt-out, and not necessarily show that enthusiasm. So it can be really refreshing, yes refreshing is, is what I would say, for the patients" (Faculty Clinician).*

This enthusiasm to engage with patients, their genuine interest in them and in what they have to say, was proposed as an important contextual element in increasing patient satisfaction.

### **Mechanism Reasoning - 'Interested In me'**

Assessment and care planning by an IP team of students and faculty clinicians (mechanism resource) under such contexts, was described by faculty clinicians and students as leading patients to reason that their care providers are genuinely interested in them and have their best interests at heart (mechanism reasoning) resulting in increased patient satisfaction (outcome). A student leader represented the connections within this CMO as follows:

*"I think the patients can really sense it, our enthusiasm and interest in them, it leaves them feeling that we... the team, are truly interested in them, as a person. That we have their best interest at the front of our minds, and in what we do. I, I think that really makes a difference to them, to how they feel about the clinic, to like, to their satisfaction with it all" (Student leader).*

### **5.4.1.2. Patient CMO Theory 2: Which seeks to explain how the opportunity for patients to play a role in the education of health professional students within an interprofessional SRC may enhance patient self-esteem**

**Box 18: Patient CMO theory 2**

Resource	+	Context	→	Reasoning	=	Outcome
The opportunity for patients to play a role in the education of health professional students in an IP SRC	•	<ul style="list-style-type: none"> <li>Patients from a marginalized population</li> <li>Students who are receptive to learning from patients</li> <li>Role modelling of patient engagement and participation</li> <li>A shared language</li> </ul>		<ul style="list-style-type: none"> <li>I have value</li> <li>I have a valuable contribution to make</li> </ul>		Increased self-esteem

The IP assessment and care planning process was thought to provide patients with the opportunity to play a unique and important role in the student's education (mechanism – resource) by being actively engaged with students in sharing their history and knowledge of their condition. Patients who are provided with such opportunities were thought to experience an increase in their self-esteem (outcome). A student volunteer, talking about learning from patients stated:

*"One comment that I got from a patient really stands out to me. The last time I was there a patient came in, and sometimes, in a pro bono clinic, these patients are embarrassed that they have to come into this type of clinic because they can't pay themselves, they don't have insurance. But he said, 'I feel when I come in, I'm comfortable'. You guys don't treat me any differently'. And he actually felt like he was giving back to us because we're students. We're able to learn from him and he's getting the services in return. So that was a really nice experience to have that conversation with the patient"* (Student volunteer).

Several contexts were identified as important in supporting the achievement of this outcome. These included patients coming from a marginalized population, students who receptive to learning from patients, the role modelling of patient engagement and participation by faculty clinicians, clinic managers, and senior students, and the language in which the interaction is conducted.

### **Context – Patients from a marginalized population**

The interviewees described the patients attending the clinic, as representing a commonly disenfranchised, marginalized and ignored population. The patients' status as undocumented immigrants, as non-English speakers, or as people experiencing poverty, was thought to limit the opportunities available to them, to be asked for, or to share their knowledge and opinions. This was thought to have a negative impact on their sense of self-worth and self-esteem.

### **Context – Students who engage and are receptive to learning from patients**

When students respect and value the knowledge the patients' bring to the encounter, their knowledge of their own condition and life situation, they engage patients in conversation and questioning to uncover that knowledge and the patients play an active role in educating the students, as experts in their own condition. The capacity for patients to play such a role was thought to be dependent upon the students being receptive to learning from patients.

As one faculty clinician stated:

*"I think it only works if the students are ready and willing to learn from patients. It's not usually a problem. They are so captivated by them, by what they have to say"* (Faculty Clinician).

A comment from a student volunteer:

*"It's a cool opportunity for them (the patients) to see the spark in our eyes, of something that we've never seen before, and they get to be like the cornerstone of that kind of building, of like, that learning for us"* (Student Volunteer).



### **Context – Role modelling patient engagement and participation**

The faculty, clinic managers, and senior students were described as playing an important role in creating an environment that fosters such receptive student attitudes. Through the role modelling of an approach to care that engages patients as members of the care team, ensuring they are provided with the opportunity to be active participants in their care, and that care planning is done with them, not to them. Such role modelling of patient engagement and participation was thought to support the students in developing appropriate behaviours and using appropriate patient engagement strategies. The following statement from a faculty clinician describes how they attempted to facilitate such patient engagement within the student IP primary care teams:

*“I usually encourage them that the best thing to do is to talk about the options with the patient. I will try to get them to do some education when we're in the room, so we will clarify ahead of time what the options are. In the room, I will probably be like, remember how we talked about what the options were for this, and this, why don't you go ahead and discuss that with the patient. So they will go through the options like we can do this, or we can do that, what are your feelings about that? And I believe that is good for them to practice, giving instructions to patients, good for them practicing talking about options with the patient, umm, instead of just saying this is what we are doing” (Faculty Clinician).*

When another faculty member talking about role modelling patient engagement was asked about what she saw as the most important aspects of this role modelling, responded as follows:

*“Um, that you have to be available, you have to be present. And so if you're, if you're going to make time purposefully to dedicate to something, put the cell phone away, look people in the eye, and listen to what it is that they're telling you. And so much of what is happening in an interaction with the patient is nonverbal. And so you're missing the cues if you're just thinking of the next question, and you're not really listening, and observing, and watching, and, and trying to figure out what's really happening with that patient. So if I, if I could role model that for a student at any level and any profession I, I will be happy with that” (Faculty clinician).*

A clinic manager, asked about patient engagement strategies they role modelled to students shared the following:

*“I think, I think we try to role model patient engagement...um. By making sure we actually have conversations with the patients. Maybe ask them, ask them about what they want to get out of this. I guess their goals. But also what's most valuable to them. And, and giving some choices, yes choices, rather than telling them what to do” (Clinic Manager).*

### **Context - The language of the interaction**

As with the previously articulated CMO theories, the student-patient interaction being conducted in the patient's primary language or with the support of a trained medical translator was reported to be an important contextual factor in the attainment of enhanced self-esteem for patients who participate in the education of students within the clinic.

### Mechanism reasoning – I have value

During their assessment and care planning by an IP team (mechanism - resource), patients from population groups that are usually marginalised and have limited opportunities to share their knowledge, are provided with the opportunity to play an active part in the education of health professional students. Under the previously identified contexts, the interviewees reported that such patients come to see themselves as playing a valuable and important role in the student's education. This leads them to perceive their information and knowledge has value and they have a valuable contribution to make to the students, boosting their sense of self-worth, and value (mechanism - reasoning) resulting in a positive impact on their self-esteem (outcome). A student manager voiced this as follows:

*“ I think the patients, they, well, they feel good about themselves, because they are helping us, helping us learn. I think it's a chance for them to realise the value they bring to us, and, and to our learning. We need them, to share their experiences with us. I think that boosts their confidence, you know, in themselves, in what they have to offer. I guess it's, maybe, maybe you could call it self-worth or self-esteem or something like that? Yes, a boost to their self-esteem, to feel valued and valuable to us” (Student Manager).*

### 5.4.1.3. Patient CMO Theory 3: Explaining how individualized health education from an IP team of students leads to improved clinical outcomes for patients

**Box 19: Patient Programme CMO Theory 3**

Resource	+	Context	→	Reasoning	=	Outcome
Health education from an IP team of students		<ul style="list-style-type: none"><li>Longer face-to-face interaction</li><li>Individualised health education</li><li>Sufficient knowledge</li></ul>		The patient feels “I have the knowledge to help myself. I feel empowered and capable”		Increased engagement in self-care Leading to improved clinical outcomes

When patients attend the clinic, their appointments regularly last 1 to 2 hours. The increased time patients spend in the clinic was thought to open opportunities for students to provide them with health education (mechanism – resource). Novice students, in the early stages of their professional programme, are not able to perform as many tests and measures as senior students and are limited in their ability to provide care services. The key roles for novice students were described as taking a health history and vitals and providing health education information to patients during their appointment. This information was described as primarily addressing diabetes management, blood pressure monitoring and control, and depression. It was suggested that health education and information on self-care options provided by an IP team of novice students (mechanism – resource) would result in increased patient engagement in self-care strategies (intermediary outcome) and such engagement would lead to measured improvement in clinical outcomes. Several contexts were identified as important in achieving these outcomes.

#### Context – Longer face-to-face interaction

When patients received health education information related to their problems and issues, from an IP group of students in a longer face-to-face interaction (than in a traditional primary care appointment) during which they have time to ask questions and have them addressed, they gain valuable knowledge regarding their health condition and options for self-management. The face-to-face nature of the education was suggested to encourage patients to feel more comfortable asking questions about their condition and about what they can do to manage it.

*“The patients are with us a good long time. So we have a great, a great opportunity I guess, that most people don’t get to talk with them face-to-face about their condition. We can do some health education with them, right there and then. We have the time, to walk them through some info about their diabetes, or their hypertension or such” (Student Volunteer).*

Another volunteer student talking about providing health education to patients stated the following:

*“We get to do a lot of patient education, like health education and self-care ideas with them. I am always surprised when they tell us they have never had that before, or have never heard that before. They ask us a lot of questions. It’s, it’s obvious they haven’t really had someone sit down with them before and really talk things over, like how to control their blood sugar, or like their blood pressure” (Student Volunteer).*

#### Context – Individualized health education

Conducting the health education on an individual basis rather than in a group setting was thought to be an important contextual factor in achieving the outcome of increased engagement in self-care. It was suggested that individualized health education provides an opportunity for the education to be specifically tailored to the unique needs, resources, and capacities of individual patients. When talking with the researcher about the students providing health education to the patients in the clinic, a faculty clinician stated the following:

Faculty Clinician: *“It’s difficult for them (the patients), they don’t have a lot of access to care, and when they do it tends to be answer questions, do tests. So the health education piece gives them a chance to really ask questions. To talk about things they can do that will be possible within their own capabilities and resources. To find the things that might work for them. It’s individualised, which makes a big difference”.*

Researcher: *“A big difference? In...”*

Faculty Clinician: *“Yes, a big difference in, in finding the things that might work for them. Not just general advice, but, well, they have a chance to talk about the possible options, what might work for them, what might not, why. Like how do you eat healthy when you only have a few dollars a day to feed your family, if that? So general ideas about nutrition are often not that helpful. But how to realistically cut back on sodium. How to get vegetables in the area at low cost, which food banks tend to carry more fresh food, things like that”.*

#### Context – Students with sufficient knowledge of the patient’s health condition

Interviewees suggested the students providing the health education needed to have sufficient knowledge regarding the particular health conditions and concerns of interest to the patient. This was necessary for the students to be capable of providing individualized

health education and to appropriately answer the patient's questions. The health education delivered by students addressed the most common patient presentations in the clinic: diabetes management, blood pressure monitoring and control, and managing depression. This limited the required knowledge base for the students to a common set of conditions that impact a large number of the patients attending the clinic. The following quote comes from clinic manager who talked about health education within the clinic:

*" We cover the common problems that patients in the clinic present with, so diabetes, hypertension, depression. It's not a big list, but it covers a lot, maybe most of our patients. It helps to be a short list, means we can target it to what the new students know and what most of our patients need" (Clinic Manager).*

### **Mechanism reasoning - Empowered and capable**

Patients who receive individualised health education, including self-care strategies related to their specific problems and issues, from an IP group of novice students (mechanism – resource) under the contexts discussed above, were thought to gain valuable knowledge regarding their health condition and realistic options for their self-management. Study interviewees stated that such knowledge leads patients to believe they have increased capacity to help themselves and to feel empowered and capable to do so (mechanism – reasoning). This, in turn, leads them to engage in increased levels of self-care (intermediate outcome) and engaging in such self-care was believed to result in improvement in clinical measures associated with their condition, such as blood pressure, and blood sugar regulation (Outcome). A faculty clinician described the connections within this CMO theory as follows:

*" So the new students, the first years, they don't have a lot of clinical skills yet, but they do have knowledge they can share with the patients about their condition. So they do patient education with them. A few students in a team helping the patient understand their condition and what they might be able to do themselves to help. Like how to monitor their blood pressure or some information about, about diet, like sodium intake. Things they can do to help themselves. I think it empowers them. Yes, empowers them to take care of themselves, and I think we can measure that, that impact on their hypertension, on their BP and such" (Faculty Clinician).*

### **5.4.2. Faculty clinician and student CMO theories that seek to explain how patients in the IP SRC receive more holistic care**

Two connected CMO theories (see Table 22) were developed explaining how faculty clinicians and students believed patients received more holistic care in the IP SRC. Holistic care was described in terms of patients having more of their needs identified and more of their needs addressed.

#### 5.4.2.1. Patient CMO theory 4: Which seeks to explain how an IP team assessment results in the identification of more patient needs

**Box 20: Patient CMO theory 4**

Resource	+	Context	→	Reasoning	=	Outcome
Assessment by an IP team		Different professional perspectives - asking different types of questions		They are interested in me, in more than my physical health. Comfortable to disclose my needs		The identification of an increased number and variety of patient needs

CMO4 attempts to explain how an IP team assessment (mechanism – resource) might result in the identification of an increased number and variety of patient needs (outcome). Analysis revealed a single context linked with the attainment of this outcome.

##### Context - Different professional perspectives

The faculty and students who designed delivered, and experienced the clinic believed the different professions involved in the IP team assessment, bring different professional perspectives, or lenses, to the patient assessment. These differing perspectives lead them to ask different types of questions covering a more varied range of topics and issues than would occur in an assessment by a single profession (context). A faculty clinician talking about the different professions approaches to patient assessment stated the following:

*“We all look at it slightly differently, we have similarities, but each of our professions also has a unique perspective. We look at things in a certain way, that’s shaped by our profession. So we ask different questions, focus on different things, their physical signs and symptoms, their home life, their stress, their work. When it all comes together, we get a more, a more complete picture of what’s going on. A more holistic view, I’d say”* (Faculty Clinician).

The combined questions asked by members of the different professions in the team addressing physical health, emotional well-being, life at home, at work, the quality of relationships, etc., were reported to result in a more holistic patient assessment. A student leader described it as follows:

*“I do think that they’re just going to get more well-rounded care. And even though maybe they’re just coming in for a flu shot, we often ask them so many questions, that we find other things that might be bothering them. And we can address those things”* (Student Leader).

##### **Mechanism reasoning - Interested in me**

A more holistic assessment involving questions about different aspects of the patient’s life, health, and wellbeing was believed to encourage patients to reveal more of their issues and concerns. Asking patients a wider range of questions about different aspects of their life was thought to make patients perceive the healthcare team as being truly interested in them, in more than their physical health, in more than the problem that brought them to the clinic (mechanism – reasoning). Leading them to feel more comfortable disclosing a wider range

of their physical, emotional, and social concerns to the team (outcome). A student volunteer translator provided the following example of a patient revealing more of their needs:

*“And so the lady came because of a problem with her shoulder and she ended up saying that she had like, I can’t remember exactly, but she had nystagmus, and she also had... she had cervical cancer or something. She had some type of reproductive issue but she hadn’t been in to see a doctor for women’s health in a while. And also her eyes were not good”* (Student Volunteer).

#### 5.4.2.2. Patient CMO theory 5: Which seeks to explain how more patient needs are addressed in an interprofessional SRC

**Box 21: Patient CMO Theory 5**

Resource	+	Context	→	Reasoning	=	Outcome
More needs identified through an IP team assessment		Co-located services affording easy access to convenient, affordable, specialty care services and expert faculty clinicians		Reducing the patient burden of cost, travel, transportation, and time off work		More patient needs are addressed

The second CMO theory proposed by interviewees to explain the provision of more holistic care addresses what happens when patients reveal more of their needs during their IP team assessment (mechanism - resource) and how this results in more of their needs being addressed (outcome). The context associated with this outcome was the co-location of services within the clinic and the resultant easy, convenient, affordable access to specialty care services this provided.

##### Context – When services are co-located

When patients feel comfortable to disclose a wider range of their physical, emotional, and social concerns to their care providers in a clinic where they have access to a wide range of health professions and to specialty services, co-located within the same building (context) patients are afforded easy referral to on-site specialty services and consultations.

The student volunteer translator who raised the issues about the woman who came to the clinic with a shoulder problem but the assessment revealed she had problems with her vision and reproductive health, illustrated this well in her continued statement as follows:

*“And so when I went with her to book her next appointment, not only did we schedule a PT appointment, we scheduled her an ophthalmology like consult so she could get a vision screening, so then she could go see the ophthalmologist. But I also scheduled her for a women’s health appointment”* (Student Volunteer Translator).

The operation of multiple services within the same clinic building, managed by the same clinic management team of students, made it convenient for patients to be referred to and attend an extended array of specialty services and have access to expert faculty clinicians. As a free clinic, the patients have access to a wide range of specialty care services at no cost.

*" So I think the clinic gives the patients really good access to care, not just for primary care, but for specialty services too. Everything is right here for them, and they don't have to worry about, well about if they can pay for it, or if they can take more time off work to come for an appointment. It's all right here in the same place. They get to see specialty providers and our faculty who are experts in their profession. So they are seeing the best people" (Student Leader).*

A clinic manager also highlighted the convenient and affordable access to specialty care that is provided by the services all being within the same free clinic:

*" It makes it so much more convenient for the patients because we have all the services right here in the same clinic. We don't have to refer them off to another facility. We just walk them over to a specialty clinic. We might see someone with a problem that could be helped by physical therapy. If we think, oh this person is a great candidate for physical therapy. Instead of making another appointment for the following week we might just bring them down into our physical therapy section and they can have an evaluation right there and then" (Clinic Manager).*

### **Mechanism reasoning – Reducing the burden**

Those interviewed believed the clinic provides patients with convenient on-site access to a wide range of care services to address multiple identified needs. Such care is available at the same location and may even be possible within the same clinic visit. This was thought to 'reduce the burden' of cost, travel, transportation, and time off work for patients (mechanism – reasoning). In these conditions, patients were thought to be more likely to get and attend appointments with specialty providers and as a result, have a wider range of their needs addressed (outcome).

## **5.4.3 – Faculty clinician and student theories to explain how patients received better quality care in an IP SRC**

Three CMO theories (see Table 22) were developed to explain how faculty clinicians and students thought patients receive better quality care in the IP SRC. They addressed care coordination and patient safety.

### **5.4.3.1 Patient CMO theory 6: Explaining how assessment and care planning by an interprofessional team results in better care coordination**

**Box 22: Patient CMO theory 6**

Resource	+	Context	→	Reasoning	=	Outcome
Shared IP team assessment and care planning		<ul style="list-style-type: none"> <li>- Co-location of services and providers</li> <li>- In-person hand-offs and transfers</li> </ul>		<ul style="list-style-type: none"> <li>- Simultaneous first-hand information sharing reduces the number of hand-offs and transfers.</li> <li>- Face-to-face interaction result in better quality, more effective hand-offs and transfers</li> </ul>		Better care coordination

The faculty clinicians and students who designed, developed and experienced the clinic believe when an interprofessional team is responsible for patient assessment and care delivery (mechanism - resource), patients experience better quality handoffs (or hand-overs) and transfers, and there is a reduced need for multiple hand-offs between care providers and transfers between facilities resulting in better care coordination (outcome). A clinic manager stated the following with regards to hand-offs:

*"I think that if you could work towards that, where you're like, more closely connected and you know, you're doing the assessment together. Like maybe you have the same exact chart, it's not going to a different facility. And so I guess working better together to make sure like the patient's getting the best care possible. Rather than having more handoffs, or more, like transfers from one place to another. Like people who always, like, consistently know what's happening. It's not like, 'oh I have to call Dr so-and-so, and then we had to call you know, X, Y, Z, and then it's a bunch of phone tag'" (Student Clinic Manager).*

Two contextual factors were identified that were thought to influence the attainment of this outcome. These were the co-location of services and providers within the clinic, and the use of in-person hand-offs and transfers.

#### Context – Co-location of services and providers

The co-location of specialty services and providers within the same IP clinic (context) was thought to reduce the number and increase the timeliness of hand-offs and transfers.

*"We can go straight to one of the specialty clinics and hand-off the patient right there and then. It's just so great to be in the same building. We can talk to each other about a possible referral and make it happen. Yeah, like I said, right there and then" (Clinic Manager).*

#### Context – In-person hand-offs and transfers

Hand-offs and transfers in the clinic occur in- person through face-to-face communication, followed by documentation and referrals within the electronic record. This was thought to be an important feature in achieving the outcome of better care coordination.

### **Mechanism reasoning – Simultaneous information sharing and more effective humanistic communication**

The simultaneous, first-hand information sharing that occurs during an IP patient assessment was suggested to reduce the need for multiple patient hand-offs and transfers. During an interprofessional team assessment, multiple professions are simultaneously hearing the same information. Information is communicated to the different professional care providers at the same time within the same patient encounter. Interviewees reasoned this reduces the need for multiple hand-offs and transfers. A student leader explained it as follows:

*" So we all hear the same story revealed at the same time. We don't have to pass it from one person to another. We hear it in real time, right from the patient. It doesn't get, well... I guess you could say, it doesn't get messed up or lost in translation. We don't need to hand-off to each other, we all get the same information at the same time" (Student Leader).*



Interviewees also reasoned that the in-person nature of the handoffs and transfers increased their quality by providing a more effective form of communication between care providers and introducing a more humanistic approach (mechanism - reasoning). In-person patient transfers provide an opportunity to introduce the patient to their new care providers. The introduction of the patient by one provider to another, rather than them being transferred as information on a page of notes, was thought to improve the quality of hand-offs and transfers by introducing a more human touch to the process (mechanism reasoning). Such care delivery by an IP team was thought to result in better care coordination, by reducing the number and increasing the quality of hand-offs and transfers between care providers. A student volunteer, who had worked in patient care before joining their current health professional education programme, described the importance of hand-offs and referrals occurring in person:

*"It's important because I've worked in places where you got a referral from a physician and you treat the patient but all you send back is the written update, the written progress note and there is no conversation at all. There's no phone call, there's no face-to-face interaction really talking about this patient. So that's when, kind of, information's lost. So you're kind of just stats on a piece of paper and that's what determines improvement or not. So it's important to have that communication, and in-person" (Student Volunteer).*

A student leader described how patient referrals and hand-offs occur in the clinic as follows:

*"We get the in-house referral from the doctor or the physician assistant, and yeah, they, and then we treat them and you know we say okay you're going to go back to the doctor, see what they say.... they talk with each other. You know this patient is progressing this way, I am concerned about this, can you take a look, give us your ideas, that kind of thing. So being in the same building, having that ability to talk with each other is really helpful" (Student Leader).*

And from another student:

*"Yeah, because you know in a regular outpatient facility they'd refer to PT and what they might get back is a discharge note or something like that. So like, that conversation piece is the additional thing that happens in the clinic. It's better. Better for the patients too, we get to take them to meet the other people who will care for them. They actually meet them. We get to hand them over in person, introduce them as a real person" (Student Clinic Manager).*

#### 5.4.3.2. Patient CMO theory 7: Which seeks to explain how assessment, care planning and shared problem-solving by an IP team improves patient safety through error reduction

**Box 23: Patient CMO theory 7**

Resource	+	Context	→	Reasoning	=	Outcome
Interprofessional team assessment and care planning involving shared problem solving		A comfortable environment to raise safety concerns		Multiple checkpoints Feel they have more opportunities and are more comfortable raising concerns and catch potential errors		Improved patient safety through reduced errors

The interprofessional team assessment and treatment planning process shared problem solving (mechanism resource) was thought to enhance patient safety by reducing errors (outcome). Interviewees associated a single contextual factor as influential in the attainment of this outcome, the presence of a comfortable environment to raise safety concerns.

#### Context – A comfortable environment to raise safety concerns

A faculty member described the importance of creating an environment where everyone on the team feels they can raise safety concerns stated the following:

*"You want everyone to feel like they are important, and they can contribute to the care of the patient. So if they see that something might have been missed or might not be right, that person has to feel comfortable saying something. And not be worried that the physician is going to be yelling at me if I make some comment or something went wrong. For patient safety sake for one thing, for the most important thing probably is patient safety. That everyone has to feel comfortable discussing any possible problems, you know with someone who traditionally would have been higher in the hierarchy" (Faculty Clinician).*

A nursing faculty member describing an example they use with the students to highlight the need to speak up regarding safety issues:

*"And one of the things that I was explaining to them is, I give them this example. If you've got a two-month-old baby and you're looking at an order and you are thinking, that is not the right dose, and you calculated it out, and that is definitely not the right dose for that weight. And you know, it is not uncommon for the novice nurse to be afraid at 2 AM to wake the physician to say, are you sure you meant to write this dose because I don't think that's right. And, and yeah in the interprofessional clinic there is such camaraderie and understanding of each other, that I think the novice nurse might be less intimidated to make that phone call, and I think the physician may be thankful for receiving the phone call instead of being bothered that they were woken up. So I think it just kind of helps perspectives a little bit. Makes things safer too, when they can speak up" (Faculty Clinician).*

#### **Mechanism reasoning – Multiple checkpoints**

An IP team assessment and treatment planning process (mechanism – resource) involves multiple people and professions evaluating and problem-solving together. Interviewees reasoned that the various stages of this process provided multiple safety checkpoints that created opportunities to catch potential errors and raise safety concerns within the team (mechanism - reasoning). For example, when the students assess the patient together with a senior student or clinic manager, when students prepare for their presentation to the faculty clinicians, when students present to and received feedback from the interprofessional team of faculty clinicians, when they complete their documentation together, and when the documentation is checked by the provider. This process ensures multiple opportunities are presented to check for errors.

#### 5.4.3.3. Patient CMO Theory 8: Which seeks to explain how raising safety concerns during assessment and care planning by an interprofessional team mitigates errors

**Box 24: Patient CMO theory 8**

Resource	+	Context	→	Reasoning	=	Outcome
Safety concerns are raised in an IP team assessment and care planning		• Co-location of multiple services		Immediate on-site response to issues		Improved safety through mitigated errors

When safety concerns were raised during the interprofessional team assessment and care-planning process (mechanism resource) the clinic structure was thought to increase responsiveness to safety concerns and mitigate potential errors (outcome).

Context – The co-location of multiple services with the presence of clinicians from different professions within the clinic

The co-location of multiple services and clinicians from different professions within the same clinic was reported to be an important contextual factor in mitigating errors and improving patient safety.

#### **Mechanism reasoning – Immediate consultation in response to safety concerns**

When safety concerns were identified during the IP team assessment and care planning process, the co-location of multiple professions and specialty services within the same clinic was reported to result in immediate action through obtaining a rapid on-site consultation with the relevant profession (mechanism - reasoning), increasing the responsiveness to safety concerns and mitigating potential errors (outcome). Several students provided examples of issues that had been raised in the clinic. One example involved concerns about a patient's medication that were raised to the primary care team and the pharmacy by a student in a specialty clinic:

*"We had this one person that was having all these strange symptoms. And you know, they don't really tell us much about their, you know, we asked them about, are they taking any medications. We knew that they were taking gabapentin, but when we actually talked to the primary care team and pharmacy about them, it turned out that they had actually just bumped up their prescription. But they were taking the same amount of pills per day at the higher dosage. And here we had to talk to them, and they lowered the dosage. So that was another case. Where after that they didn't have any kind of these nerve-related symptoms after that. And all of that was just basic communication between people, pretty much, because they were right here in the building with us" (Student Volunteer).*

A student volunteer from the physical therapy clinic provided the following example:

*"So if there's somebody that's like, they've got kind of high blood pressure, and are experiencing, maybe some symptoms, that you think are worrying. Maybe you just*

*send them right back up the stairs, it's always good to be cautious...Yes to a certain degree it makes you more comfortable in some of those things too. That things you are concerned about can be looked at right away, so you stop those possible errors" (Student Volunteer).*

## 5.4. Key study findings

The application of a realist approach to theory development resulted in the programme theories articulated within this chapter. These identified what happened to students who participated in three different interprofessional learning opportunities within the interprofessional student-run clinic and what students and faculty clinicians believed happened to patients who received care in the clinic. While each programme theory describes the unique connections between specific contexts, mechanisms, and outcomes, further analysis across the full data set and programme theories revealed four key findings which are suggested to shape interprofessional outcomes for students and patients across the various experiences. The following section presents these key study findings.

### 5.4.1. Exposure to different forms and durations of interprofessional work within both stable and flexible teams was found to result in a diverse pattern of positive and negative interprofessional student outcomes

When the clinic was originated the designers established interprofessional primary care teams as the interprofessional educational component for students in the clinic. However, this study identified additional interprofessional opportunities within the clinic, the student leadership team, and the specialty clinics. These three experiences presented students with opportunities to engage in very different forms of interprofessional work producing very different patterns of interprofessional outcomes (see Table 23).

The primary care team involved short-term exposure to working on a flexible interprofessional team generating a pattern of outcomes that focused on the individual. They included both positive and negative changes in confidence, collaborative and communication behaviours, and participation in interprofessional activities. The work within the primary care team appears to be representative of interprofessional collaboration as members of the team shared some accountability and interdependence for the tasks involved in patient assessment and care planning, there was some clarity to the roles they played in the assessment process, and the tasks they undertook were predictable and non-urgent. The short duration of this experience provided limited opportunity for interprofessional team development.

**Table 23:** The identified outcomes for the interprofessional student-run clinic, classified according to the Modified Kirkpatrick typology

Kirkpatrick Level	Positive Outcomes	Negative Outcome
Level 1: Learner's reactions	A valuable experience	Frustration Wasted time
Level 2a: Modification of attitudes/perceptions	Increased confidence Reduced fear and anxiety Challenged stereotypes Commitment to team goals A share team identity Respect for the contribution of other professions to patient care Trust Perceive equal status	Reduced confidence Perceive inequality
Level 2b: Acquisition of knowledge/skills	Knowledge and skills for interprofessional teamwork Knowledge and understanding of the skills of other professions	
Level 3: Changes in behaviour	Continued participation in the clinic Speaking up to share ideas Seeking additional interprofessional opportunities. Advocating for patients Taking a leadership role	Not returning to the clinic Reluctance to speak up Reduced engagement with other professions Increasingly focussed on their own profession
Level 4a: Changes in organisational practice	More holistic care delivery Better care coordination – improved hand-offs and transfers Improved patient safety Reduced errors	
Level 4b: Benefits to patients/clients	Increased satisfaction Increased self-esteem Increased engagement in self-care Improved outcomes for health and wellness More needs addressed	

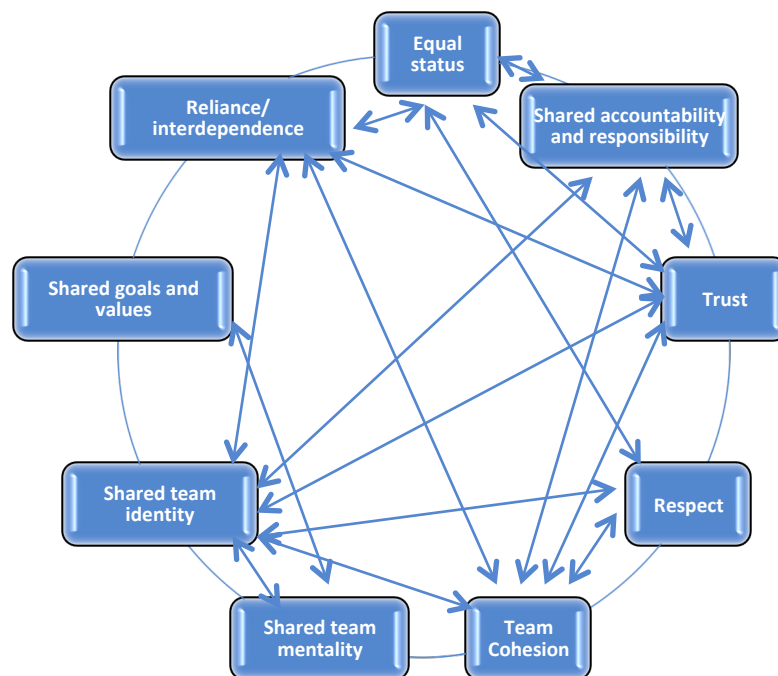
The specialty clinics exposed students to working on stable uni-professional teams, but interprofessional opportunities were brief and ad hoc, generating a mixed pattern of outcomes. For those who engage in the limited interprofessional opportunities available within the specialty clinics, this experience did foster interprofessional collaboration e.g. increasing knowledge of other professions, fostered attitudes for collaboration, challenged stereotypes, increased confidence, and developing interprofessional communication and collaborative behaviours. For those who did not experience interprofessional engagement, the experience led them to become increasingly focused on their own profession, enhancing negative stereotypes of other professions, and leading them to withdraw from further interprofessional engagement. The ad hoc nature of the interprofessional opportunities within the specialty clinics would suggest that this experience involves interprofessional networking. The work did not rely on the interdependence of students from different professions working together to complete tasks, and there was limited integration between the specialty clinics and the other clinic areas. Although connected by their colocation within the same clinic, there was limited interaction between the specialty clinics and the primary care teams.

Unlike the specialty clinics or the primary care teams, where groups form and reform every evening, the student leadership experience exposed students to prolonged engagement in a stable interprofessional team, resulting in a pattern of outcomes focused on the team, and the knowledge, skills, attitudes, and behaviours for interprofessional teamwork.

Student leaders serve for a full year and the experience involves collaborating on a regular basis through participation in weekly or bi-weekly team meetings, additional meetings with the university and clinic administration, regular volunteering in the clinic, and engaging in frequent in-person, telephone, and email communication with teammates. Student leaders described the experience as a '*shared team experience*' and the work of the student leadership team is clearly interprofessional teamwork. The duration of this experience allowed for clarity with respect to team roles, tasks and goals, high levels of interdependence and team integration, shared accountability and responsibility, and the development of a shared team identity. The student leaders viewed their work as important and valuable, and as having high stakes, and the team tasks were complex and often urgent. They believed their teamwork had a direct impact on the success of the clinic and the care of its patients. This led them to take on shared responsibility and accountability for the success of the clinic. They described developing trust and respect for one another and came to rely upon one another with high levels of integration and interdependence within the team. These highly interconnected team components identified in the student leadership CMO theories are presented in Figure 6.

These descriptions from the student leadership team and the programme CMO theories, present this experience as a potent opportunity for interprofessional team training through prolonged exposure to working on a stable interprofessional team. It was clearly the most intensive interprofessional experience within the clinic, involving a longer duration, and engaging students in more complex interprofessional tasks.

**Figure 6:** Showing the highly interconnected team components identified in the student leadership CMO theories



The students and faculty clinicians also believed that student clinic leaders developed the necessary skills and attitudes to serve as effective members of an interprofessional team. Student leaders described how the experience left them feeling well equipped for such work and led them to actively seek out opportunities to engage in interprofessional collaborative teamwork during their profession-specific clinical rotations. They also described how they came to value the availability of interprofessional opportunities when considering their future job options.

So these three student experiences within the clinic can be seen to provide exposure to very different forms of interprofessional work resulting in very different patterns of outcomes for students.



#### 5.4.2. Developing a sense of equal status between students, facilitated by psychological safety and the shared identity as a novice, was found to lead to positive interprofessional outcomes for students, while perceived inequality was associated with negative interprofessional outcomes

The importance of establishing a sense of equal status amongst the students is a key finding of this study. Equal status was represented as both a mechanism and context shaping the student outcomes within all three interprofessional learning opportunities. For novice students who repeatedly volunteered in the interprofessional primary care teams, equal status was presented as a mechanism leading the students to develop increased confidence and reducing their fear and anxiety (primary care CMO 3). This sense of equal status helped establish psychological safety as students came to view the clinic as a safe place to speak up and share their ideas. This facilitated positive changes in the students' communication and collaborative behaviours (primary care CMO 5). Within the student leadership team equal status was identified as a context building trust and respect between team members (student leadership CMO 4 and 5), supporting the development of a shared team identity (student leadership CMO 3), and fostering a sense of shared responsibility, reliance, and interdependence, and resulting in increased team cohesion and enhanced team working (student leadership CMO 4).

In contrast, a lack of equal status led some students within the specialty clinics to feel different too, or lesser than, other professions. A lack of interprofessional opportunities along with failed attempts to engage in such activities was believed to foster this perceived lack of equal status. The students reported feeling marginalized, excluded, and different causing both students and the specialty clinics, to become increasingly uni-professionally focussed (specialty clinic CMO 4). In specialty clinic, CMO 5, a selection process based upon the judgement of the value of the experience to the students' profession led to the denial of access to the interprofessional specialty clinics for students from some professions, particularly physical therapy and psychology. These students reasoned that their access had been unfairly denied in preference for other professions (medicine, nursing, and PA) resulting in their withdrawal from interprofessional activities within the clinic.

It is evident that equal status was an important factor shaping the experience and modifying student outcomes across the interprofessional learning opportunities within the clinic.

A shared equal status between students was generated through establishing psychological safety (a safe place to speak up) facilitated by the shared novice status of the students and

the role modelling of interprofessional collaborative behaviours by faculty. Inequality was fostered by the role modelling of hierarchical approaches to care, a lack of interprofessional opportunities, and selection policies and procedures that differentiated between professions within the clinic. This resulted in attitudes and behaviours that were not indicative of interprofessional collaboration, encouraging the students to focus on their own profession and to disengage from interactions with other professions.

#### 5.4.3. Judgements regarding the value of their contribution to patients, the value of the experience to themselves, and the value of their time were found to be instrumental in shaping student outcomes

Students and faculty clinicians identified judgments made by students regarding the value of the experience to be an important mediator for student outcomes. Students measured the value of the experience in relation to, the value to themselves, the value of their contribution to patients, and the value of their time. These value judgments were thought to shape student's decisions to continue to participate in the interprofessional clinic. These value judgments were shaped by the amount of contact students had with patients.

Contact time with patients was found to be critical to the students' judgments regarding the value of their volunteer experience, the value of the preparatory activities required to volunteer in the clinic, and their judgements on how well the clinic was organized. These judgements formed the basis for the students' decision to return or not to return to volunteer again.

Students who experienced high contact time with patients reasoned that the experience had value, while students who experienced low contact with patients reported feeling frustrated with the experience, questioning both the value of the experience to them and the value of their contribution to patient care. Students with both high and low levels of patient contact described their time as a limited and precious resource and identified how they carefully judge the value of time spent in various activities, including the clinic, against the possibility of using that time for studying. The students judged the value of their clinic experience with respect to three aspects: the value of their contribution to the patients, the value of the experience to them, and the value of their time.

Students with high patient contact believed they had made a positive contribution to patient care, their contribution mattered, and their participation had value as it achieved something for the patients. They also judged the experience as having an impact on their learning and viewed their participation as a valuable and productive use of their time. These students chose to continue to participate in the clinic. In contrast, students with low patient contact

questioned their contribution to the patients. Having participated in the care of very few patients, in some cases only one; they believed they had not made a useful or valuable contribution to patients or the clinic. They also did not view the experience as making a valuable contribution to their learning. They reported frustration with the experience describing it as a waste of their precious time, time they could have used for studying, and they chose not to return.

Although all new volunteer students were required to complete the same preparatory activities to volunteer in the clinic, students who experienced high and low patient contact came to view this preparatory work in very different ways. Students with high patient contact described the preparatory activities as resulting in them feeling well prepared for their volunteer experience, and they viewed the clinic as well organized. In contrast, students who had low patient contact viewed the preparatory work as a waste of their time, and the clinic as being poorly organized.

A lack of exposure to patient contact means students do not receive adequate exposure to interprofessional working. Without sufficient exposure to patients and other professions the experience just does not work. It is worth noting that they did not leave the clinic because they were disregarding IPE.

#### 5.4.4. Service colocation within an interprofessional student-run clinic was proposed to facilitate the delivery of better quality, more holistic, integrated care, resulting in positive patient and system level outcomes

Service colocation was identified as an important context across several CMO theories (Patient CMO theory 5, 6, and 8). It was suggested to facilitate patients receiving more holistic care, result in better care coordination through reduction in the number and improvement in the quality of cross-professional hand-offs and transfers, and to mitigate errors with a resultant improvement in patient safety.

Faculty clinicians and students believed care delivered in an interprofessional SRC resulted in patients receiving more holistic and better quality care leading to better patient outcomes. System-level outcomes (Kirkpatrick level 4) were also identified for the clinic related to care quality and patient safety (see Table 23). Achievement of these outcomes was facilitated by the colocation of clinic services. The colocation of care services within the interprofessional clinic was reported to result in patients receiving more holistic care. Such care was thought to meet a wider range of the patients' needs related to both their health and wellbeing and to result in improved outcomes. System-level processes associated with better care quality

and increased patient safety were also linked with service colocation e.g. better hand-offs and transfers, quicker responses to safety concerns, and mitigated errors.

## Chapter Summary

This chapter has presented both the programme theories and key findings identified within this study. The following chapter draws on the literature within the field of interprofessional education, and sociological and psychosocial theories to discuss these four key study findings.

# Chapter 6 - Discussion

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With the aim of deepening insight and understanding of what happens in an interprofessional SRC, this chapter provides an in-depth discussion of the four key study findings presented in chapter 5. Taking a deeper dive, it discusses them in relation to pertinent literature and examines them through the lenses of relevant sociological and psychosocial theories. It also reflects on the application of a realist approach to theory development within this study and discusses the wider implications of this approach to interprofessional education and collaborative practice. It also proposes recommendations derived from the key study findings, discusses the study limitations and proposes suggestions for future research.

## 6.1. Discussion of key finding 1: Exposure to different forms and duration of interprofessional work within both stable and flexible teams was found to result in a diverse pattern of positive and negative interprofessional student outcomes

The clinic provided very different forms of interprofessional learning including prolonged participation on a stable interprofessional team and short-term exposure to working in flexible or ad-hoc teams. It exposed students to different forms of interprofessional work including, networking, coordination, collaboration and interprofessional teamwork and involving different stages of team development.

These exposures resulted in very different outcome patterns. Prolonged exposure to working on a stable interprofessional team (student leadership team) provided the opportunity for team formation resulting in outcomes focussed on the team, and the development of knowledge, skills, attitudes, and behaviours for interprofessional teamwork. Short-term exposure to working in flexible or ad-hoc interprofessional teams (the interprofessional primary care team and the specialty clinics) did not result in interprofessional team development. The outcomes for these experiences focussed on the individual and involved positive and negative outcomes for knowledge, skills, attitudes, and behaviours for collaboration.

The tendency within the literature is to regard stable teams as the gold standard for interprofessional collaborative care. From this perspective, the interprofessional student

leadership team would be viewed as the optimum experience for students within the clinic. Several authors have challenged the assumption that stability is optimal for interprofessional healthcare teams (Iedema and Scheetes 2003, Engeström 2008, Bleakley 2013). Their argument is based upon recognition of the innate complexity and fluidity of modern healthcare practice. Bleakley (2013) described an evolution in healthcare from an environment seeking stability to one in which constantly changing healthcare practices have necessitated a focus on adaptability. For example, Reeves et al.'s (2010) study of interprofessional work within a UK in-patient ward reported that rather than describing stable interprofessional teams participants described interprofessional interactions on the ward as loosely formed and transient, with staff coming together "to tie and untie interactive threads of activity" (Reeves et al. 2010, p.85). Engeström (2008) developed the term 'knotworking' to describe this notion of teams forming, separating and reforming as needed. He also used the term 'teeming' to describe the work of collaboration. This reconceptualization from teams to teeming moves attention from teams as their constituent members to a team as a process. To consider what is happening rather than who is involved (Engeström et al. 1999), and examining how individuals come together to work together in planned as well as in unplanned, ad hoc, or impromptu collaborations (Carthy, 2008; Bleakley 2013). Within this perspective, teams are viewed as inherently unstable, complex and dynamic systems and change as a constant practice feature necessitating flexibility to achieve effective collaborative practice (Bleakley 2013).

This argument would suggest that to prepare healthcare students to serve as collaboration ready healthcare practitioners requires them to be trained to work effectively in both stable and flexible adaptive interprofessional teams. This would require the development of skills that support adaptability and flexibility within the various environments and situations arising within real practice (Bleakley 2013). Healthcare practitioners must be capable of accommodating to rapid change and ambiguity, embracing new identities as collaborative interprofessional team players. This requires skills to work in teams that are frequently formed in an ad-hoc manner. It requires them to engage in frequent activities across teams and to handle the increasing complexity of healthcare delivery and deal with the challenges this brings to realise effective care coordination (Iedema and Scheetes 2003).

Within the interprofessional SRC the students are provided with the opportunity to experience working on ad hoc, flexible, and stable teams, to engage in different types of IP work such as networking, coordination, collaboration and teamwork, and in teamwork that differs in both duration and intensity. These different interprofessional learning opportunities provide opportunities to train students in a wide range of collaborative practices with each having value in the preparation of students as collaboration ready healthcare providers. The combination of these experiences is argued to provide increased preparation beyond that available in a single interprofessional learning experience.

### 6.1.1.Recommendations

To support the students in developing a repertoire of collaborative skills that would prepare them for work in both stable and flexible teams, and engage in different types of interprofessional work, it is recommended that students be exposed to as many of the interprofessional opportunities within the clinic as possible. Expanding the availability of shadowing and consultation, and adding additional professions to the existing interprofessional primary care teams would extend the available opportunities within the current operation of the clinic. It is also recommended that the clinic leaders consider the potential of expanding the clinic to operate on a more than weekly basis. This would ensure the availability of extended opportunities for students to participate in the different interprofessional experiences within the clinic.

## 6.2. Discussion of key finding 2: Developing a sense of equal status between students, facilitated by psychological safety and the shared identity as a novice, was found to lead to positive interprofessional outcomes for students, while perceived inequality was associated with negative interprofessional outcomes

The importance of establishing a sense of equal status among students is a key finding of this study. Equal status was found to shape student outcomes across all three interprofessional learning opportunities within the clinic. It was associated with increased confidence and reduced fear and anxiety, leading students to view the clinic as a safe place to speak up and share their ideas supporting positive changes in interprofessional communication and collaborative behaviours. With respect to team development, equal status was associated with building trust and respect between team members, supporting the development of a shared team identity and increasing team cohesion.

A lack of interprofessional opportunities, along with failed attempts to engage in interprofessional activities, was believed to foster a lack of equal status leading students to feel marginalized, excluded, and different. Additionally, becoming increasingly unprofessionally focussed withdrew them from interprofessional activities within the clinic.

The notion of equal status is a key component of Allport's Intergroup Contact Theory (Allport 1954, 1979), which suggests that bringing groups together is insufficient to reduce negative

intergroup attitudes and stereotyping. It proposed several contact conditions that supported positive group interaction, including that each group in the contact situation should have equal status (Hewstone and Brown 1986).

Several authors have applied contact theory as their theoretical foundation for interprofessional education (Hewstone, et al. 1994; Carpenter 1995; Carpenter and Hewstone 1996; Bridges and Tomkowiak 2010; Mohaupt et al. 2012), however, the literature review revealed only one study that used contact theory within an interprofessional SRC (Sick et al. 2014) and they did not address the issue of equal status.

Carpenter and Dickson's (2016) review of the use of contact theory within the design and/or evaluation of IPE found only three studies that addressed equal status. All were related to the same interprofessional programme for pre-qualifying students at Bristol University in the UK (Carpenter 1995a, 1995b; Carpenter and Hewstone 1996; Hewstone et al. 1994). They described an implied equal status as a consequence of all participating students being in the final year of their programme. Carpenter and Dickson (2016) suggested for senior pre-qualifying students equal status was established as a product of the number of years the students had spent in their programme and the specific subject knowledge and expertise they had attained. As such, they were suggesting equal status relates to time in the programme and acquired knowledge. Others have suggested that equal status is achieved by ensuring students from all participating professions experienced the same assessment or through planned pedagogical activities that do not stress professional affiliation (O'Halloran et al. 2006).

Within the current study, students and faculty clinicians did not describe equal status within these terms but in terms of the student's beliefs, perceptions, or reasoning. This raises an important question of where equal status lies? The findings of this study would suggest that one feels equal or perceives equality, and therefore equal status lies not in years in training, acquired knowledge, or pedagogical design, but is a belief that can shape an individual's attitudes and behaviours.

Students may come to the interprofessional SRC with preconceived notions of where they sit within the hierarchy of professions involved, and the various structural processes and exposures in the clinic, e.g. role modelling by faculty clinicians, may promote or inhibit their perceptions of equal status causing students to re-evaluate or confirm their preconceived ideas. For example, a selection process that precludes certain professions from participation in the interprofessional specialty clinics leads students to feel unequal, while participation in shared decision-making on the student leadership team, leads them to feel equal.



Carpenter and Dickinson (2016) highlighted the need for additional knowledge about the contact variables and how these variables produce change. This study begins to address this need through its identification of how equal status was generated and how it shaped student outcomes. The following sections address how equal status was facilitated within the interprofessional SRC through a shared novice identity and establishing psychological safety.

### 6.2.1. Potential to develop equal status through a shared 'novice' identity

The potential of the shared identity of 'novice' to develop a sense of equal status amongst student volunteers from different professional programmes within the IP primary care teams, is a unique finding of this study. Within this study, a novice is defined as a student within the first semester of the first year of their health professional education programme. These students had not yet developed their profession-specific knowledge and skills and this was thought to allow them to see one another as similar. Similarities included being at the beginning of a new profession and career, being new to their programmes of study, concurrently taking similar courses such as anatomy and physiology, having limited profession-specific knowledge, and being new to the clinic and to patient care. These are argued to be important aspects that placed the students on an equal footing. For these novice students, the equal playing field they described was not based upon what the students knew or the professional skills they possessed as suggested by Carpenter and Dickson (2016), but rather upon what they didn't know, about a shared status of not knowing, of being a novice to their profession and to the clinic.

The clinic exposure occurs at a point in time when these novice students have not yet established a strong sense of their professional identity. When students enter their professional programmes they are considered to hold a fledgling professional identity shaped by their expectations of their profession, media accounts of their chosen profession, and their own experiences. Flanagan (1979) describes this as anticipatory socialization to the profession. During profession-specific training, their professional identity becomes moulded and remoulded through a process of professional socialization (Arndt et al. 2009; Cameron 2011; Khalili et al. 2013). This leads students to know what they do, in terms of their profession-specific knowledge and skills, and who they are as a professional. It also establishes their work beliefs, values, roles, and professional culture (Hershey 2007; Newman 2005). Khalili et al. (2013) suggest that anticipatory socialization provides students entering their professional training with a somewhat skewed view of their own and other professions. Their subsequent professional training involving uni-professional socialization with faculty and students from their own professional group (as described as occurring within the specialty clinics) re-frames the students' views of their own profession but in the

absence of interprofessional opportunities students' views of other professions remain largely unaltered. Khalili et al. (2013) suggest IPE can support the development of an interprofessional identity alongside professional identity.

The students within this study, being within the first months of their professional programmes, had not yet formed a strong professional identity. They described how recognition of their similarities as novice students supported the development of a sense of equal status. Suggesting this early phase in their education may be an appropriate time to focus on similarities between students and their professions rather than emphasising their differences and may provide a window of opportunity for co-developing their professional identity alongside a shared identity as a novice interprofessional team member.

There has been much debate within the field of IPE regarding the appropriate timing of IP learning activities (Elise and Whitehead 2018, Kozmenko et al. 2017). The debate centres around whether IPE should be implemented early in the curriculum before the students establish stereotypical perspectives of other professions (Kozmenko et al. 2017), or later when they have developed their own professional identity and competencies and can offer more to an interprofessional interaction (Elise and Whitehead 2018; Brewer et al. 2017). Stull and Blue (2016) suggest that early IPE can result in weakened professional identity and declining attitudes towards one's own and other professions. However, there is also support in the literature for the potential of IPE introduced in the early stages of professional training, prior to students becoming acculturated to their profession, to facilitate interprofessional learning and cultivate interprofessional identity (McNeil et al. 2012; Khalili et al. 2013). Such exposure has been suggested to protect students from developing professional tribalism and adopting specific perspectives and stereotypes of other professions, which are commonly perpetuated by their own profession (Horder 1996). Coster et al. (2008) support this notion that IPE within early professional training can minimize the development of negative biases and perceptions about other professions by shaping interprofessional attitudes at the early stages of student education and professional identity development. Additionally, Cooper et al. (2015) suggest the early introduction of interprofessional activities may increase student confidence in their own professional identity and lead them to value professional difference. This was evident for students who had the opportunity to observe or shadow in a specialty clinic. The experience was reported to challenge stereotypes of the observed profession and increase knowledge and respect for care delivered by other professions and those who were observed, shadowed, or provided consultations believed the experience increased the respect for their profession and elevated its status to an equal footing with other professions in the clinic by challenging stereotypes.

For some students, the experience increased focus on their own profession and reduced attempts to collaborate with other professions. They felt marginalized, excluded, different, and unequal. These negative outcomes were shaped by both a lack of interprofessional opportunities and failed attempts to engage in potential interprofessional activities. These students were clearly seeking interprofessional opportunities and when unable to access them, despite their attempts to do so, they turned their attention to their own profession, and the opportunities provided within the specialty clinics to develop their profession-specific knowledge and skills.

Under these circumstances, the students began to see themselves and their profession as different from the other professions in the clinic. Focussing on the uniqueness and difference, rather than the similarities between themselves and the other professions. This runs counter to the condition of group members being made aware of both their similarities and differences, which is also identified within contact theory as an important condition to reduce negative intergroup attitudes (Hewstone and Brown 1986). As a result, both the students and the specialty clinics became increasingly focussed on their own profession, developing a strong professional identity without the co-development of a shared interprofessional identity. This finding is supported by the literature which suggests the development of a strong professional identity can lead individuals to view their profession as different from, or better than, other professions (Baker et al. 2011; Cameron 2011; Khalili et al. 2013) and can interfere with interprofessional collaboration (Cameron 2011). This was clearly the case for students in the specialty clinics.

This focus on difference within the specialty clinic is counter to the focus on similarity and the shared identity of novice evident within the IP primary care teams. Similarities focus early led to IP identity, focus on difference led to professional identity strengthening – suggests early IP exposures should focus on similarity and difference added later.

Tajfel and Turner's (1986) social identity theory postulates that individuals develop a group identity as a result of socialization into a group. This process involves the identification and categorization of in-groups and out-groups. Individuals are motivated to represent themselves positively and favour in-groups over out-groups (Haslam et al. 2000). In-groups are ascribed a set of positive characteristics and belonging to an in-group has been associated with the development of trust and the fostering of group cohesiveness (Turner 1985; Wackerhausen 2009). This was clearly the case for the student leadership team who were reported to have developed a shared team identity and were reaping the benefits of a shared in-group identity, in trust, respect, interdependence, and team cohesion.

A shared in-group identity has also been associated with the development of out-group bias, discrimination, and distrust of members of the out-group. A strong orientation towards one's own professional in-group can potentially result in distrust towards members of out-group professions (Khalili et al. 2013). This can lead to in-profession / out-profession behaviours including favouring members of their own profession and excluding or withdrawing from engaging with members of out-professions (Baker et al. 2011; Cameron 2011; Lloyd et al. 2011). This was demonstrated by students in the specialty clinics who withdrew from interacting with students from other professions. Such withdrawal has been shown to interfere with effective collaboration (Baker et al 2011; Cameron 2011; Lloyd 2011). When individuals become focussed on their own professional practice, limiting their interprofessional communication (Lloyd et al. 2011) and withdrawing from interactions with other professions, it can result in a loss of understanding of how professions interconnect and how their different roles and responsibilities can combine to ensure better quality care (Khalili et al. 2013). Attention to professional identity at the expense of developing an interprofessional identity has been demonstrated to lead to misconceptions between professions, enhanced negative stereotypes, and the development of prejudices towards out-group professional members (Carpenter and Dickinson 2008; Salvatori et al. 2007). This form of professional socialisation leads to strong association with one's own professional group and a focus on the differences between professions (Coyle et al. 2011). This supports the findings for students in the specialty clinics who came to see themselves and their profession as unique and different.

### 6.2.2 Perceived inequality of students in the specialty clinics as a threat to professional identity

Students, who were denied access based upon the judgements regarding the relevance of the experience to their profession, believed their access had been unfairly limited in preference for another profession. Steele et al. (2002) described such situations when members of a profession feel marginalized, or the role or expertise of their profession is devalued, as representing a threat to their professional identity. Chrobot-Mason et al. (2009) identified 5 triggers of social identity threat; differential treatment which occurs when groups receive unequal opportunities or treatment, different values, assimilation which involved one group expecting another to act like them, insulting or humiliating action to a member or members of a group, and when intergroup anxiety is high simple contact can trigger group social identity threat and lead to polarization (McNeil et al. 2012). Such professional identity threat has been shown to lead to negative affective responses (Cottrell and Neuberg 2005) including the withdrawal of team members. This threat can also lead to withholding of information (Amason 1996) and can engender organizational conflict (Lau and Murnighan 1998).

In the case of the specialty clinics not being accepted to participate in the IP specialty clinics based upon a judgement of the relevance of the experience to their profession was construed by students as differential treatment, indicating favouritism towards some professions (medicine, nursing, and PA) at the expense of professions with more limited access to interprofessional activities. Such differential treatment, in-group favouritism, is the most commonly identified trigger for identity threat (Chrobot-Mason et al. 2009) and is suggested to “heighten the salience of professional membership as a social identity” resulting in professional polarization (McNeil et al. 2012, p.9) which does not foster interprofessional attitudes or behaviours.

It is also worth noting that it is possible to simultaneously hold positive attitudes towards both the in-group and the out-group (Hind et al. 2003) and to simultaneously hold both professional and interprofessional identities (Hean and Dickinson 2005). This would appear to be the case in the student leadership team where the students developed a shared team identity alongside the development of their professional identity.

### 6.2.3. Psychological safety

Development of equal status hinged on the students seeing the clinic was a safe place to speak up to share their opinions and ideas. This notion of a safe place to speak up is consistent with the concept of psychological safety. Described as:

*“An atmosphere within a team where individuals feel comfortable engaging in discussion and reflection without fear of censure”* (O’Leary 2016, p.29).

It involves group members being comfortable to take risks, be vulnerable, and concerns their perceptions regarding the consequences of taking interpersonal risks (Bateman et al. 2003; Edmondson and Lei 2014). Within a team, psychological safety means no team member will be punished or humiliated for disclosing errors, asking questions, or seeking help (Edmondson 2002). Engaging in such behaviours involves risk, the risk of being seen as incompetent, as lacking knowledge, or as being truculent. An individual’s perceptions about the consequences of interpersonal risk-taking are closely associated with their willingness to take risks such as asking questions, proposing new ideas, seeking feedback or disclosing a mistake (Edmondson 1999; West 2000). Managing this risk is important, especially in the presence of those with more power or status or who are responsible for performance evaluation. In the case of the student-run clinic, the faculty clinicians would hold such a position.

Psychological safety has been identified as a crucial factor in speaking up in teamwork, team learning, and organizational learning (Edmondson and Lei 2014) with a recent meta-analysis demonstrating a strong and consistent connection between psychological safety and learning (Sanner and Bunderson 2013).

In this study, students described psychological safety in terms of viewing the clinic as a safe place to speak up and share their ideas. Within the literature, on psychological safety, this is referred to as voice (Edmondson and Lei 2014). Large-scale organizational studies across multiple industries and settings (Ashford et al. 1998; Detert and Burris 2007; Walumbwa and Schaubroeck 2009; Detert and Edmondson 2011) have consistently demonstrated the impact of psychological safety on the willingness of individuals to speak up to share ideas and suggestions, termed as promotive voice, and to express concerns, known as prohibitive voice (Liang et al. 2012). Differences in speaking up behaviour have been shown to relate closely to the implicit theories individuals hold about when and why speaking up is considered to be risky (Edmondson and Lei 2014). When people believe they are within a safe environment to do so they have been shown to be more likely to put forward their ideas and suggestions, to seek help, seek feedback, and admit to errors (Schein 1996; Edmondson 2004).

So how is an environment of psychological safety created? For students in the interprofessional student-run clinic, the role modelling of communication and collaborative behaviours by faculty clinicians was identified as influential in fostering the development of psychological safety.

#### 6.2.3.1 Role modelling: Faculty clinician role modelling of collaborative behaviours and its impact on the development of psychological safety

Faculty clinician role modelling of collaborative behaviours was identified as an important factor contributing to the development of psychological safety. In contrast, when faculty clinicians, senior students, and clinical managers role modelled hierarchy and professional dominance this was found to reduce student confidence and increase their reluctance to speak up. Clearly, this role modelling did not foster psychological safety.

Although the term role model is widely used, there is a lack of consensus on the definition and limited understanding of the processes involved in role modelling. The original use of this term is credited to Merton (1957), who used it to describe individuals who serve as role behaviour examples. More recently the term has been used to describe examples of success “*who often provide a template of the behaviours that are needed to achieve such success*” (Lockwood 2006, p.36). It could be argued that in the eyes of the students the faculty clinicians represent examples of professional, and potentially interprofessional, success and their actions in the clinic present a template of behaviours, which students come to associate with success.

Two particular collaborative behaviours role modelled by supervising faculty clinicians were proposed as crucial to establishing psychological safety. These were encouraging and facilitating equitable student participation and responding to student input in a respectful manner. When students were exposed to faculty clinicians who encouraged and facilitated each student to share their ideas with the team, and worked to balance the input of all team members ensuring every student had an opportunity to participate, this was reported to lead them to view the clinic as a safe place to speak up fostering psychological safety, more specifically promotive voice.

When students did speak up, the behaviours role modelled by the faculty in response to the student's input, showing respect, reinforcing their knowledge, engaging them in further questions, and helping them by working through a problem or a thought process together, was also considered to enhance psychological safety. As previously discussed the decision to speak up or not was identified as closely linked to the implicit theories individuals hold about the risks of doing so (Bateman et al. 2003; Edmondson and Lei 2014). Feeling safe to speak up was reported to promote changes in interprofessional collaborative and communication behaviours including speaking up to share their opinions and ideas, asking questions, raising concerns on behalf of their patients, sharing the leadership of the team, and actively seeking out opportunities to collaborate with other professions. These behaviours align well with the findings of Shein (1996) and Edmondson (2004) who reported that people who believe they are within a safe environment are more likely to share their ideas and suggestions, admit their mistakes and errors, seek help, and ask for feedback.

A different form of role modelling was also reported within the clinic, the role modelling of hierarchy and professional dominance. This role modelling was reported to result in negative outcomes for students including a lack of psychological safety. It was also associated with reinforced negative stereotypes of the dominant profession leading students to withdraw from interaction with them. It was clear that such encounters did not foster psychological safety nor did they facilitate interprofessional collaboration. These encounters left students from the non-dominant profession feeling unwanted, excluded and disrespected. The student descriptions of such experiences clearly resonate with the consequences of a lack of psychological safety identified by (Edmondson and Lei 2014). Unfortunately, this study was not able to explore what happened to the students who were members of the profession demonstrating the dominant behaviour. This is where observation could potentially have been a useful tool.

#### 6.2.3.2. Knowing what and how to role model?

Within the study site, there was no evidence of preparatory training for the faculty clinicians, other than a general orientation to the clinic. They did not receive training on IP

collaboration, or on what or how to role model. So how do the faculty clinicians, senior students, and clinic managers know which behaviours to role model? Based upon their interview comments, they relied on their past experiences in practice or on clinical placements. This reliance on past experience rather than specific training on interprofessional facilitation has been identified as a common experience for faculty and clinicians who deliver interprofessional education (Milot et al. 2017; LeGros et al. 2015).

The role modelling literature has identified several attributes that contribute to successful role modelling including, shared group membership, the similarity between the role model and the person receiving the role modelling, sociability and warmth, role model success, and competence (Morgenroth et al. 2015). Shared group membership within a role modelling relationship has been demonstrated to increase performance, reduce stereotype threat, increase self-efficacy beliefs about success, and self-perceptions of competence (Von Hippel et al. 2011; Morgenroth et al. 2015). This may equate with the increased confidence experienced by students within the current study. The notion that a shared group identity can influence the success of role modelling gives rise to several questions. What is the shared group membership for the students and faculty clinicians? Is it membership of the interprofessional primary care team or are the students identifying with faculty clinicians from their own profession? Which would suggest an in-group identity with only specific faculty clinician role models? These issues are worth particular consideration given the evidence that similarity to the role model has been shown to have an impact on the success of role modelling that extends beyond that of a shared group identity (Asgari et al. 2011; Cheryan et al. 2011). Within the role modelling literature there is a clear focus on role model attributes with little information of how role modelling actually occurs, little is known about how role models motivate those they role model to, or the impact of role models on those who aspire to be like them (Morgenroth et al. 2015). The focus is directed at the level of the individual, and as such the concept of role modelling by teams, to teams, as is the case when the interprofessional faculty clinician team role models to the students, does not appear to have received any attention within the role modelling literature. Identification of specific role modelled behaviours and their impact on outcomes within this study adds insight into how role modelling may work within the setting of an interprofessional SRC, and regarding its possible impact on establishing psychological safety.

#### 6.2.4 Recommendations

To reduce the potential for professional identity threat and create the possibility for dual identity formation for all students in the specialty clinics, it is recommended that clinic leaders ensure interprofessional opportunities are available for all participants in the specialty clinics. Establishing practices that expand the in-group and mitigate the out-group discrimination and distrust that was evident in the specialty clinics. It is recommended that the selection process for the interprofessional specialty clinics be changed to provide an



equal opportunity to participate for all students. This recommendation is believed to have potential to reduce the threat to professional identity and negate the less than positive outcomes for the students who participate in the specialty clinic areas. For these students, the experience was not as expected and not as promised. They signed up to volunteer in an interprofessional clinic, but did not have the opportunity to participate interprofessionally. This recommendation is also believed to support changing the experience for these students to more closely meet their expectations for the clinic.

The faculty clinicians relied on their past clinical experience and intuition to work together on the interprofessional faculty team and supervise the interprofessional student teams. They had not received preparatory training on interprofessional education, how to facilitate interprofessional learning, or how to be effective role models for collaborative behaviours. The appropriate training of interprofessional facilitators has been identified as an important factor in ensuring the success of interprofessional learning (Baker et al. 2018, Reeves et al. 2016). LeGros et al. (2015) identified the detrimental impact of a lack of preparation of facilitators on the success of IPE. IPE is a complex endeavour requiring a different skill set than uni-professional facilitation (MacKenzie et al. 2014). It is therefore recommended that faculty undergo training prior to participating in the interprofessional clinic. This training should address conceptions of interprofessional education, how to facilitate interprofessional learning, competencies and skills for effective role modelling, specifically addressing communication and collaborative behaviours that were identified as fostering equal status (seeking equal input from all students and responding to such input in a respectful manner). Hall and Zierler (2015) suggest the skills and behaviours included in interprofessional facilitator training should mirror the competencies expected for successful engagement in interprofessional collaborative practice. The training should also address how to foster psychological safety and specifically address the negative impact of role modelling hierarchy and professional dominance on psychological safety and as a result, student outcomes.

### 6.3. Discussion of key finding 3: Judgements regarding the value of their contribution to patients, the value of the experience to themselves, and the value of their time was found to be instrumental in shaping student outcomes

Students judged the value of their clinic experience with respect to three aspects: the value of their contribution to patients, the value of the experience to themselves, and the value of

their time. The linchpin for seeing the clinic as a valuable experience was spending time working with patients. High levels of contact with patients led students to see the experience as valuable and they returned to volunteer again. Low levels of patient contact led students to question the value of the experience, to view it as a waste of their time and they chose not to return. Students highly valued the authentic real-life experience of working with patients and the amount of direct contact time with patients was instrumental in their decision to continue to participate in the clinic.

Authentic learning requires active student engagement in learning-by-doing in real life situations, working collaboratively with others, and engaging different perspectives to solve real-world problems (Callison and Lamb 2004). Key attributes of authentic learning include students participating in work, which is representative of the work undertaken by their profession, addressing real-world problems, and requiring students to present their work to others outside the classroom setting (Callison and Lamb 2004; Maina 2004; Renzulli et al. 2004). This is clearly the case in the interprofessional SRC e.g. when students in the interprofessional primary care team work together to assess and plan care for patients and present their assessment findings to an interprofessional team of faculty clinicians. Presenting their work to others is suggested to influence how students view the importance of the tasks they undertake, draws students in as key stakeholders in the experience and in their learning, leading them to form an emotional attachment to the work (Rule 2006). Presenting to the faculty engaged students in higher level thinking and metacognition, through asking questions, problem-solving, testing and revising their ideas within the patient assessment process, drawing conclusions, and communicating their ideas to the faculty clinicians. These have all been identified as key aspects of authentic learning (Renzulli et al. 2004; Callison and Lamb 2004; Maina 2004).

A lack of exposure to patients meant students received limited exposure to both patient care and interprofessional working. Without sufficient exposure to patients and other professions, the experience was not valued. It is worth noting that students left the clinic not because they were disregarding IPE and did not see value in it, they left because they did not really experience it.

The students enter the clinic with an expectation that they will see patients, will deliver hands-on care and will have the opportunity to work on an interprofessional team. Their decision not to return may be associated with the failure to meet such expectations. Foster et al. (2016) described how failure to meet student expectations impacted satisfaction for senior dental students participating in an IPE rotation at a rural primary care clinical in New Zealand. The dental students placed a high value on clinical time with patients, described time spent in interprofessional activities as not as valuable. In this study, dental students viewed clinical time as time spent engaging in profession-specific assessment and

treatment, not time spent in interprofessional activities. The dental students engaged in constant comparisons regarding the use of their time within their interprofessional clinical placement to how they believed their peers were spending time within non-interprofessional clinical placements. They believed their peers were getting more hands-on time with patients involving more complex treatments. This left them feeling left behind and viewing their interprofessional placement as of lesser value than profession specific placements. The value and use of their time were described as shaping negative views of the interprofessional placement. Foster et al. (2016) described how they instituted a structured preparation for the students focussed on changing their placement expectations with the hope of changing the perspectives for these senior dental students. Over successive years they described a turn around in the student's perspectives by reframing their expectations, leading them to view the experience as a unique opportunity to gain additional interprofessional skills not normally taught in dental school. Although Foster et al.'s study involved senior dental students, and the students in this study are in their first year, the notion of reshaping student expectations and consideration of how to potentially modify the experience of first-time volunteers in the interprofessional SRC may be worth some consideration.

### 6.3.1 Recommendations

High contact time with patients may be the factor that ensures the students see their participation in the clinic as being meaningful and valuable. The main reasons for low levels of patient contact were identified as patients not attending their appointments or shortage of supervising faculty clinicians. As highlighted in chapter 2, these are commonly reported problems for SRCs (Khorasani et al. 2010, Holmqvist et al. 2012). To address the first of these issues it is recommended that clinic manager who allocate the patients to teams throughout the clinic evening prioritize the allocation of patients to teams with first-time volunteers.

To address the second, it is recommended that this responsibility for the provision of adequate supervising faculty within the clinic, which is currently the responsibility of the student leaders on the executive officer's board, be transferred to the university. Faculty currently support the clinic on a volunteer basis. It is recommended that the university institutionalize the faculty role in the clinic by including this work as a component of their regular faculty appointment. Allocating faculty to the clinic as a part of their regular scheduled work would ensure the consistent availability of faculty clinicians to provide the necessary level of student supervision and mentoring. This would require the University to commit to supporting a change in faculty workload and potentially requiring the allocation of financial resources to cover the cost of faculty time.

It is also recommended that faculty take joint ownership of the clinic with the students to ensure appropriate oversight. However, a more prevalent role for faculty in the clinic management should be carefully instituted acknowledging the strong sense of ownership the students have for the clinic and the motivation this fosters.

#### 6.4. Discussion of key finding 4: Service colocation within an interprofessional student-run clinic was proposed to facilitate the delivery of better quality, more holistic, integrated care, resulting in positive patient and system level outcomes

Service colocation was found to impact both patient care and patient outcomes including the provision of more holistic care, better care coordination, and improved patient safety. It is important to note that these include system level outcomes, which were not included as outcomes of interprofessional education for pre-qualification students within in Reeves et al.'s (2010) interprofessional framework, as discussed within the literature review (page 13). The interprofessional student-run clinic was found to have outcomes representing interprofessional education (IPE), interprofessional practice (IPP) and interprofessional organisation (IPO).

Colocation has been described as:

*"The extent to which patient care services are coordinated across people, functions, activities, and sites over time"* (Ginsburg 2008, p.11).

The colocation of health or health and social services within the same physical space has been proposed as a means to enhance interprofessional collaboration by systematically linking and integrating care services (Goodman 2015). Colocation has been identified as a form of care coordination and an approach to achieving integrated care (Cocozza et al. 2000; Shevlin-Woodstock and Thorson 2004).

The World Health Organisation (2002) defined integrated care as:

*"A concept bringing together inputs, delivery, management, and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion. Integration is a means to improve services in relation to access, quality, user satisfaction, and efficiency".*

Stancin (2005) described colocation as sitting towards the higher end of a spectrum of service integration. It is interesting to note that within the early stages of the interprofessional SRC design, the minutes of the student leadership meetings identified

integrated care as a possible approach for the clinic. While it appears that no further action was taken to explore this option, care integration and colocation were identified as instrumental in shaping patient outcomes within the clinic.

Colocation involves a range of different strategies, also regarded to exist on somewhat of a continuum. At one end sharing space within the same building with no real collaboration or coordination of services and at the other highly coordinated collaborative systems of care integration (Stancin 2005; Ginsburg 2008). To bring clarity to the range of possible approaches and the different levels of service integration within colocated practices, the Centre for Medical Home Improvement (2001) presented four colocation dimensions for consideration; organization characteristics, responsibility for patients, coordination mechanisms, and data systems and policies (Shortell and Kaluzny 2000; Mitchell and Shortell 2000). Table 24 presents how these 4 dimensions were represented within the interprofessional SRC.

Colocation Dimension	Presentation within the interprofessional SRC
<b>Organization characteristics</b>	A single patient intake, shared appointment, and scheduling system, shared funding structure, shared clinic management team, shared clinic administration and leadership team
<b>Responsibility for patients</b>	Primary care teams share responsibility and viewed the patients as 'our patients' Specialty areas tended to describe 'my patient', providing consult on 'their patients'.
<b>Coordination mechanisms</b>	Joint review of patient assessment and care planning within the primary care teams Referral for on-site specialty care Availability of on-site consultations The possibility for concurrent treatment
<b>Data systems and policies</b>	A shared electronic medical record (EMR) A shared set of clinic operational policies and procedures

**Table 24:** Representation of four colocation dimensions within the interprofessional SRC

The literature supports the notion of the interprofessional student-run clinic being at the higher end of the spectrum of service integration. It identifies organizational characteristics across the spectrum of care integration including the establishment of formal and informal business arrangements between providers, interagency agreements, the various levels to which the administration and financial services such as billing, appointment scheduling, intake, and sharing of support and other staff, occur between the colocated services

(Shortell and Kaluzny 2000; Mitchell and Shortell 2000; Ginsburg 2008). Many of these are present within the IP SRC, exemplified by the clinic's organization structures including, a single patient intake system, shared appointment and scheduling systems, shared funding structure, and operation through a single budget and being managed by a single leadership team.

The levels of shared responsibility for patients varied within the interprofessional SRC but students throughout the clinic described seeing the patient as 'our patient', which is suggested by Fickel et al. (2007) as demonstrating shared responsibility for patient care. However, within the speciality clinic areas the tendency was to view the patient as 'my patient', with senior students and faculty clinicians providing consultations for 'their patients' in the primary care teams, suggesting less shared responsibility for patients and a lesser degree of collaboration and integration (Fickel et al. 2007).

Coordination mechanisms included joint reviews of the patient's assessment and care planning by the students and faculty, referral to on-site specialty care services, and access to on-site consultations. Several examples were also described of patients receiving concurrent treatment from different professions. These features of the interprofessional SRC align well with the coordinating mechanisms for service integration identified by Shortell and Kaluzny (2000) and Mitchell and Shortell (2000). These include effective referral procedures, use of common managers or care coordinators, consultation, joint care reviews, and concurrent treatments. The students and faculty clinicians within the clinic shared the same electronic medical record (EMR) system and operated under a shared set of policies and procedures, both of these features have also been identified as indicative of a high levels of service integration (Shortell and Kaluzny 2000; Mitchell and Shortell 2000; Stancin 2005).

Proposed patient benefits associated with colocation within the interprofessional SRC included the patients receiving more holistic care, improved care coordination, and enhanced patient safety. Support for these findings is evident within the colocation literature, which identifies benefits for patients and improvements in care quality. Patient benefits include increased service access, the potential to obtain same-day appointments at the same physical location, increased patient, family member and caregiver satisfaction, more appropriate patient utilization of health services, and improved clinical outcomes (Kendal et al. 2002; Davies 2008). Such benefits are reported as particularly evident with the integration of physical and mental health services (Williams et al. 2001).

Some caution should be exercised in considering these reported benefits, as they are based on provider perceptions with very little direct input from patients. This is also a limitation of the current study as the topic of colocation was introduced by faculty clinicians and students and not by patients.

Identifying and addressing more of the patient's needs was thought to result in the provision of more holistic care within the IP SRC. Assessment by an IP team was suggested to result in uncovering a broader range of physical, psychological, and social needs. Once identified, the colocation of different professions within the clinic provides the opportunity for these needs to be addressed in a convenient, timely and efficient manner. This finding is supported by Ginsburg (2008) who reported improved access to a wider range of services and improved outcomes in colocated services.

Improved care coordination via in-person hand-offs and transfers between colocated services was believed to result in better quality care for patients in the interprofessional SRC. This finding is also supported by the literature which has identified positive impacts of colocation on care quality including; increased collaboration and better care coordination, improved referrals between providers and services, increased efficiency, and improved health outcomes (Williams 2001; Kendal et al. 2002; Davies 2008). Most of these benefits were reported with respect to the colocation of physical and mental health services. This aspect is present in the interprofessional SRC through the colocation of psychology services.

The colocation of services within the interprofessional SRC was also identified as contributing to improved patient safety through mitigation of potential errors as it created the opportunity for immediate on-site consultation in response to safety concerns. For example, chapter 5 provided an example of how a patient attending a physical therapy appointment in the SRC reported some unusual symptoms, further questioning identified a drug error and the colocation of pharmacy services provided the opportunity to immediately correct the error. As described in chapter 2, error reduction is a major driver for interprofessional education and collaboration (Barr et al. 2011). This impact of colocation on patient safety has not been previously identified and as such is a new finding for this study.

The colocation of services was also identified as an important context in reducing the patient's burden of cost, travel, transportation, and time off work, by securing access to easily accessible, convenient, and affordable specialty care services. This is a particularly important finding for the population served by the interprofessional SRC, who do not have the benefit of paid time off work and commonly have transportation issues e.g. the students described patients spending hours on public transportation to get to the clinic.

The literature identifies potential benefits for care providers as a result of colocation. These benefits appear to reflect many aspects of interprofessional collaborative practice and include increased knowledge and comfort in addressing patient issues outside of their own scope of practice, increased interaction with other providers, increased interprofessional

relationships, and provider satisfaction (Ginsberg 2008). Negative impacts, which could be argued to reflect the difficulties of collaborative practice, have also been identified, including territory conflicts, differing opinions regarding treatment approaches and increased need for communication, case conferences, and care coordination, which places additional stress on provider time (Ginsburg 2008). The faculty and students did not directly associate any provider benefits with colocation within the clinic and all of the benefits they described related to patients. However it is worth noting that many of these benefits could be argued to relate to issues presented within previous sections of this discussion (e.g. team development within the student leadership team or the negative experiences of students in the specialty clinics).

#### 6.4.1 Recommendations

The findings of this study suggest the clinic is reaping many of the identified benefits of colocation and integrated care. It is recommended that the students and faculty adopt integrated care as a model for the operation of the clinic. The literature has identified both benefits and threats to collaboration as a result of colocation and it would behove the faculty and student leadership to consider how the benefits can be facilitated and the threats to collaboration minimized.

The system level outcomes identified within the programme theories are readily measurable, e.g. patient safety incidents, error reporting, and the tracking of problem identification and service referral to evaluate the level of holistic care provision. It is recommended that such measures are applied in the clinic to assess system level impacts about which very little is known within interprofessional student-run clinics.

### 6.5. Reflection on the use of a realist approach to uncovering programme theory

As described in chapter 1, this study arose from the interest and observations of the researcher and key issues identified within the literature on interprofessional education and student-run clinics. This study has attempted to address these issues through the application of a realist evaluation approach to theory development in an interprofessional student-run clinic. Review of the literature revealed how little is known about if or how interprofessional education works within an SRC. This is a complex intervention and attempting to uncover its underlying theory required a methodological approach with potential to embrace its complexity. Pawson and Tilley's (1998) empirical realism was selected. It was believed to hold the potential to unravel the complexities of the clinic by opening this black box and exposing its contents.

The application of this approach resulted in 24 programme theories that seek to explain how the various experiences within the clinic work. The structure of a realist approach, with its



attention to the identifying programme outcomes, the mechanisms generating them, and the contexts in which such mechanisms may work, has provided a robust structure for uncovering both the programme outcomes and the processes by which they are achieved. This approach permitted analysis of how the various clinic components interact to produce its outcomes, identifying the contextual factors and underlying mechanisms that generated both positive and negative student and patient outcomes. This provides unique insight into the processes and pathways by which the programme outcomes are achieved, which is acknowledged to be a commonly missing component of IPE (Clarke 2006).

Barr et al (2005) suggested careful application of theory is necessary to move IPE beyond mere description. The programme theories developed within this study move beyond such description of interprofessional SRCs evident in the current literature, to provide empirically testable propositions of how interprofessional education works within a student-run clinic. The judicious application of theory is proposed to aid both the design and evaluation of IPE (Clarke 2006; Reeves et al. 2007; Hean et al. 2009). The programme theories developed within this study provide valuable knowledge of how an interprofessional student-run clinic works. This knowledge can support the design, delivery and evaluation of this, and other, interprofessional clinics.

This study used Dalkin et al.'s (2015) modification of Pawson and Tilley's (1997) original realist evaluation formula ( $C+M=O$ ). The adequacy of the original formula has been a topic of some debate for realists. Porter (2015) identified both philosophical and practical problems faced by investigators in operationalizing the formula, in particular, distinguishing between the concepts of mechanisms and contexts. In an attempt to address such confusion Dalkin et al. (2015) proposed further development of the concept of mechanisms. They proposed a revised formula,

$$\text{Mechanism Resource} + \text{Context} \rightarrow \text{Mechanism Reasoning} = \text{Outcome}$$

This formula separated mechanism resources and mechanism reasoning. Their argument being that separation of mechanism into its constituents would help realist evaluators,

*"Understand the difference between the resources offered by the intervention and the ways in which this changes the reasoning of participants. This in turn helps to distinguish between a context and a mechanism."* (Dalkin et al. 2015, p1).

They also conceptualised volition as occurring on a continuum of reasoning as opposed to the on / off, firing or not firing of a mechanism. The adoption of Dalkin et al's (2015) formula meant that coding and classification of data within this study was more rigorous, clear and transparent due to the clarification of the concept of mechanism afforded by this formula.

However, I used this formula in reverse, starting with the outcome and using somewhat of a Kantian transcendental approach by asking, what contexts and mechanisms must be in

place for this outcome to be achieved? The use of this revised formula was extremely beneficial in separating the resources provided to participants in the SRC and their reasoning in response to these resources within particular contexts. In effect allowing for the separation of structure and agency as advocated by Porter (2015) who argued for the need to distinguish between social mechanisms and human agency.

This study has demonstrated the utility of this approach to increasing understanding of a complex interprofessional programme, the interprofessional student-run clinic. Highlighting the potential of this approach to uncovering what works, for whom, in which circumstances, in what respects and why within other IPE programmes.

## 6.6. Conclusions, limitations, recommendations for interprofessional student-run clinics and IPE, and future research suggestions

This final section concludes the study by providing recommendations for the development and delivery of interprofessional student-run clinics and for interprofessional education, it also presents the study limitations, and implications for future research, and provides final concluding remarks.

### 6.6.1 Recommendations for the development and delivery of interprofessional student-run clinics

The identification of the programme theories within this study makes a unique contribution to the literature on interprofessional SRCs. The programme theories identified in this study should have applicability to other interprofessional SRCs, providing a starting point for consideration of the programme theories at play within their own context.

In common with many interprofessional programmes, this study identified a lack of theory use in the design of the interprofessional student-run clinic. Unsurprising given that the health professional students who designed the clinic had not received training with respect to the theoretical or pedagogical design of interprofessional education prior to designing the clinic. This is typical of interprofessional clinics, which have been rapidly proliferating in the US and internationally, but without the application of theory to their design or evaluation.

For those considering starting an interprofessional SRC a recommendation would be to consider adopting a realist evaluation approach at the inception of the clinic design. This would assist evolving clinics to develop and articulate their implementation theory. Identifying the specific resources provided by their programme (what works? - mechanism

resources), to its various participants (for whom?), what is expected to happen to these various participants within the clinic in response to these resources (in which respects? - outcomes), and why these outcomes are expected to occur (mechanism reasoning). The programme theories identified in this study provide a starting point for consideration in uncovering the programme theories at play within other clinics.

Within empirical realism, mechanisms are considered to be real, being activated by the resources brought to bear during programme implementation, with outcomes being dependent on the various contextual factors at play within each unique setting. This would suppose that the mechanisms identified within this interprofessional SRC are also present within other clinics. While the identified contexts within this study may play a part in other settings, it is expected that other unique contextual factors will shape the outcome patterns for participating students and patients within other interprofessional student-run clinics. Considering the identified contexts within this study may prime clinic design teams to consider the unique contexts at play within their own environment.

Pawson (2008) suggests,

*“Careful abstraction does allow us to generate middle-range propositions which account for a degree of regularity across time and place. New times and new places will always find these theories wanting” (p.25).*

He highlights the need for greater specification with new settings and new implementations allowing the modification of middle-range theories. Therefore, the further study of the developed CMO theories within this study in other SRCs is argued to permit accumulation of knowledge and middle-range theory refinement.

The findings of this study have highlighted several explicit concepts and theories that can be applied to the design, re-design, and evaluation of various aspects of an interprofessional student-run clinic. Including authentic learning, colocation and integrated care, contact theory (particularly equal status), psychological safety, professional identity formation, and social identity theory. It is recommended that the concepts and theories identified in this study be considered in the design and evaluation of interprofessional SRCs currently lacking applied theory.

To address the student's lack of theoretical and pedagogical knowledge and skill it is recommended that both universities and faculty assume a more prominent role in the design, development, and delivery of interprofessional student-run clinics. Institutional support and resources should be brought to the development and operation of these clinics e.g. faculty lending their pedagogical knowledge and interprofessional expertise to the design of the educational aspects of the clinic. It is also recommended that university and clinic administrators clearly address the question of ownership of the clinic. Identifying who

should be responsible for its development and who is ultimately responsible for its success or failure, the university, the faculty, or the students?

### 6.6.2 Study Limitations

Throughout each stage of the research, process decisions have been made with the aim of selecting appropriate research practices to enhance the credibility and trustworthiness of the study findings. However, it should be noted, that the findings of this study should be considered within the context of the following study limitations.

1. This study focused on a single student-run interprofessional clinic within the US with resultant implication for the transferability of its findings to other interprofessional student-run clinics and other national settings. However, as previously discussed, empirical realism would suggest that mechanisms are real and do carry over to other settings with outcomes shaped by specific local contexts. Section 6.6.1 highlighted Pawson's (2008) conceptualisation of programme theories as middle-range theories, the study of such theories within other programmes, times, and setting would provide the opportunity for further theoretical refinement.
2. The student participants included a higher proportion of physical therapy students than is representative of the clinic. The researcher is a physical therapist and this is stipulated in her credentials, contained within the recruitment emails and documents. This may have played a part in the decisions of the physical therapy students to participate.
3. Despite recruitment efforts by the researcher and site gatekeeper, a limited number of one-time student volunteers were recruited. During interviews those who participated stated they were concerned about how much they could offer to the study due to their limited time in the clinic and had considered not participating. This may have been a factor in other one-time volunteer students choosing not to participate.
4. Although patients represent a key stakeholder group in the clinic, patients were not interviewed as part of this study. Therefore their perspective of what happened in the clinic has not been included in the development of the programme theories. This was primarily due to the focus of the study on the student interprofessional experience. Several significant logistical concerns were also taken into consideration. The patients are primarily Spanish speakers and interviews would, therefore, necessitate a Spanish-speaking researcher or the use of an appropriately trained translator for both interviews and transcription. Conducting more interviews

would have necessitated increased visits to the clinic site, which was located approximately 1,800 miles from the researchers home base.

5. The initial design of the study included observation of the clinic as a method of data collection. This was included in the ethical review process and was accepted by the ethics review board at the clinic site. While the university administration and gatekeeper did not raise any issues regarding observation when this was presented to the student leadership it was apparent they had significant concerns regarding the observational component of the study. The student leaders who control the clinic voiced their unwillingness to have an observer in the clinic. This led to a lengthy and intense debate between the university administration, faculty and student leaders, regarding who holds authority over the clinic, and how research, from both internal university researchers and external parties, might be conducted in the clinic. By the time this was debated and a decision was made, the data collection visits had already been completed. The study has therefore relied upon the reconstructed accounts from clinic designers, developers, deliverers, and participants rather than on first-hand observation. Observation would have allowed comparison of the interview and documentary data, with observations of what's happening in the clinic.
6. When re-framing and presenting proposed CMO theories to interviewees in the third set of interviews, it was apparent that there was a high level of agreement with the proposed components and their connections. While this could be considered to suggest these theories resonated with their own perceptions and experiences of the clinic it could also be indicative of social desirability. To address these potential limitation participants were provided with the opportunity to present their own ideas first with developing programme theories from previous interviews only being introduced after this had occurred.
7. Although the clinic was relatively new, some time had passed since the clinic was designed. During the interviews, it was evident that some individuals who had developed and designed the clinic appeared to have difficulty separating what they had intended to happen (implementation theory) from their experiences in the clinic (programme theory). They may have forgotten or may have altered their thoughts as a result of their experiences in the clinic. This was particularly evident in questions relating to what they had expected to happen to patients. Although they were asked to describe how they had originally expected the clinic to work for patients, it was evident that there was considerable bleeding of their knowledge of the lived experience of the clinic into their recollections of how they had expected the clinic to work for patients. This was demonstrated by their use of actual

examples from the clinic in illustrating their answers. As such, the developers and designers tended to present their experiences of the clinic in action (programme theory) rather than their intended implementation theory. During the analysis process, it was often difficult to disaggregate their comments into intended and actual.

8. There is always the possibility that important aspects of the data may have been missed particularly during the transition from open coding to framework analysis. Attempts were made throughout the process of data analysis to review codes and their placement with the framework and to constantly refer back to the original transcripts to ensure the accuracy of the connections being made. The developing CMO theories were also placed before interviewees for their consideration, refinement or refutation.
9. The development of the programme theories involved the tailoring of interview questions from one interview set to another. Analysis after each interview set resulted in emerging hypotheses that were then presented to interviewees in subsequent interviews. This approach has potential to introduce 'theory blindness', with data potentially being disregarded because it does not fit with the initial theory. This may be less of an issue with the adopted realist approach with its focus on capturing many and varied aspects of a program. Westhorp (2008, p.159) described this realist approach as involving an "*exhaustive, examination of cases in order to generate, and identify any evidence which exists to support, the operation of causal mechanisms in particular contexts*". As such, it is not focussed on identifying that which is common and generalizable, but that which is specific within the programme context. It could be argued that such an approach is less likely to miss alternate explanations within the data.

### 6.6.3. Suggestions for future research

1. This study has revealed and articulated the complexities of an interprofessional student-run clinic through the development of programme theories that provide empirically testable propositions of how the clinic works. The next logical step would be to empirically test these theories within the clinic. This could be accomplished by identifying appropriate methods and measurement tools capable of assessing the identified outcomes and ensuring the tracking of the contexts and processes identified as associated with these outcomes, e.g. a retrospective chart review could identify the response to identified safety concerns.
2. Repeating this study in the contextual setting of other interprofessional SRCs would add to the rich data generated by this study. In particular, it could add to our understanding

of the influential contextual factors that shape the outcomes of different clinics through the action of various mechanisms. Such studies could further support the refinement of middle range theories that address how interprofessional education works within a student-run clinic.

3. Examining the patient perspective would add to our knowledge of what happens to patients who experience care in an interprofessional student-run clinic. Comparing and contrasting this with the programme theories generated from the perspective of faculty clinicians and students would provide important information on how faculty and student perceptions do or do not align with those of the patients they serve.
4. It is recommended that realist evaluation is added to the research toolbox of those interested in gaining useful insights into the complex intervention that is IPE, adding it to the current tools of randomized controlled trials, systematic reviews, cohort studies, etc. that have previously been used to attempt to illuminate this field of study.

#### 6.6.4 Conclusion

As presented in chapter 2, the current literature relating to interprofessional student-run clinics is very limited with sparse attention directed towards uncovering what happens within these clinics. The theory underpinning the development or delivery of interprofessional SRCs has not been articulated in the existing literature and there is very limited knowledge regarding what happens to students or patients who participate in these clinics. This study has attempted to address this gap in the literature by answering two research questions, which focussed on identifying both the implementation and programme theories at play within an interprofessional student-run clinic.

This study applied a unique methodological approach to uncovering the programme theories, which captured and articulated the complexities of this endeavour. The depth of exploration afforded by the chosen realist methodology has opened up many aspects of the clinic for exploration, and the use of CMO configurations has provided a structured approach to portraying what is thought to be occurring within the clinic for its, various players, services, and interprofessional experiences. The study identified 24 CMO theories that seek to explain what happens to students who participate in different interprofessional learning experiences in the clinic, and to the patients receiving care in the clinic. The identification of connected threads of contexts, mechanisms, and outcomes has facilitated greater understanding of what is occurring in the clinic, linking outcomes to the factors responsible for their generation and suggesting actionable steps that can be taken within the clinic to foster positive outcomes. This should include exposing students to different types of interprofessional work, fostering equal status between students, establishing psychological safety, co-developing interprofessional and professional identities, role modelling collaborative behaviours, supporting authentic learning by maximising student

contact with patients and enhancing patient and system outcomes through service integration and colocation.

The study identified established educational and sociological theories including, authentic learning, contact theory, psychological safety, and professional and social identity theory, that can support the theoretical consistency in design, delivery, and assessment of interprofessional endeavours within student-run clinics. Such alignment of programme design and evaluation is consistently identified as lacking within the literature (Clarke. 2006; Hean et al. 2009).

## 6.7. Reflections

While the thesis to this point has been written in the third person, this section has been written in the first person as it presents critical reflections on the experience of conducting this study drawing upon the contents of the reflexive diaries I maintained throughout the research process.

Reflection on the research process and how this may shape the study outcomes has been suggested to increase understanding of the researcher role, and enhance both the trustworthiness of the data produced and the general integrity of the research (Nadin and Cassell 2006). Cassel and Symon (2004) suggest that it can also deepen the learning for the researcher by engaging them in the continuous review and critique of their research practices. Reflexivity involves thinking deeply about the researcher's methodological stance and how this may shape the study through associated assumptions and selection of study methods.

The following reflective account addresses key issues that emerged from the reflexive diaries I maintained throughout the research process.

### **A practice perspective**

I undertook this study due to a personal experience in interprofessional education and collaborative practice, and particular interest in clinical interprofessional education, which has received limited attention within the literature. This interest was developed during my career as a clinical physiotherapist working within rehabilitation settings, and as a physiotherapy and interprofessional educator within higher education settings in the UK and US.

In the US, I had observed the growth of interprofessional student-run clinics and had witnessed their spread to other nations. I was concerned that these clinics were developing with little attention to how the interprofessional aspects were designed, what the interprofessional outcomes may be, or how they may be evaluated. These concerns are



evident in the interprofessional literature (Freeth et al. 2002; Reeves et al. 2011) and support for these concerns specifically within student-run clinics was supported by the review of the literature presented in Sections 2.3 and 2.4.

I believed that failure to embrace the complex nature of interprofessional clinical education was hampering efforts to evaluate if or how such endeavours work.

At conferences, I repeatedly witnessed the presentation of interprofessional study findings reflective of a positivist or post-positivist paradigm. Including the presentation of the realities of practice as study limitations and descriptions of how they impacted control over study variables. I was concerned that if the purpose of interprofessional education is to prepare clinicians for practice, then such education needs to closely reflect the realities of practice and embrace its complex nature. The literature review supported this notion identifying several important methodological concerns associated with traditional positivist approaches to gathering evidence that limit our ability to increase understanding of how IPE may work (Cooper et al. 2001; Reeves et al. 2010a). In addition, the need for new ways of thinking about IPE research was also evident in the literature (e.g. Hammick et al. 2007).

### **A paradigm shift**

I began to explore other paradigms and approaches that may be more suitable for examining the complexities of interprofessional education within the clinical practice setting. As discussed in Chapter 3, paradigms shape the assumptions, tools and methods of a study (Denzin and Lincoln 2000). Empirical realism (Pawson and Tilley 1998) was adopted as the paradigm underpinning this study.

While I would characterise my own professional education as reflecting a post-positivist paradigm, throughout my career I have engaged in both qualitative and quantitative research and regard myself to be more of a pragmatist (Guba 1990). As such, empirical realism represented a relatively comfortable yet challenging paradigm shift, I described it in my reflexive diary as, “a comfortable sidestep, but one that requires constant vigilance”. In particular checking assumptions, practices, and thought processes tied to ways of thinking and doing research from a post-positivist viewpoint.

I have read a wide range of literature on realism, empirical realism and realist evaluation (Collier 1994; Archer, 1995; Whiteback and Bhaskar 1997; Pawson 2013) and have attended realist workshops, which provided the opportunity to discuss realist principles and research processes with experts in the field, I also participated in a realist online community (RAMESES). These interactions provided exposure to a range of different opinions and arguments within realist evaluation.

Realist evaluation is somewhat of an evolving methodology with limited sources that describe the processes or practice of conducting realist interviews or analysing the retrieved data to identify the connected threads of contexts, mechanisms and outcomes (Pawson and Manzano-Santaella 2012). Manzano (2016) highlighted a common criticism of studies identifying as realist evaluations is that they do not approach the conduct of their data collection or analysis in a realist manner. The approaches utilised in this study resulted from a desire to address this criticism by holding to a realist perspective in the manner in which data was collected and analysed. This required the adoption of a realist approach to the development and sequencing of the questions within the participant interviews e.g. asking questions about outcomes, then prompting for whom, what changed, what facilitated that change, why do you think that change happened? Analysis involved the use of open coding and the development of a unique process for seeking out connected contexts, mechanisms and outcomes threads within the original data, resisting the urge to immediately break the data into contexts, mechanisms, and outcomes, or to engage in thematic analysis that may isolate contexts, mechanisms and outcomes from one another. This was an extremely difficult and laborious process, but ultimately very effective. At the end of the data analysis process, I was thoroughly familiarised with the data and hold that the developed programme theories arose from real connections within the data, and as such have are credible (Holloway and Wheeler, 2002).

The data analysis process took a much longer time period than expected and generated a large volume of potential programme theories. This was partly due to the discovery that the clinic involved not one, but three very different learning opportunities for students. To establish what worked for whom, in which circumstances, in which respects and why required exploration of what happens to students within each of these experiences.

As highlighted by Spencer et al. (2003) data analysis was a continuous process throughout the study. Analysis began during pilot interviews and initial document collection continued through the development of the 24 programme theories and identification of the four key study findings. The process of refining and consolidating these key findings continued throughout the writing process.

The adopted realist approach opened up the interprofessional student-run clinic, exposing its contents and providing rich detail on how the clinic works. However, I struggled to find an approach to presenting the richness, depth, and volume of knowledge resulting from the analysis process. Retaining a focus on the study research questions was a necessary strategy to maintain focus when navigating the wealth of study data. Throughout the analysis, my diary states,

*"I must keep focused on the study questions, not be distracted by other aspects of the data. Keep a note of these other issues for future research or papers".*

### **The role of the researcher**

When conducting the realist interviews specific concerns relating to my role as the researcher arose. Following the pilot interviews my diary noted concerns regarding my potential influence on the interviewees.

*“I can feel the pull towards ways of thinking about experimental control within a positivist paradigm, concerns about how my potential influence may be limiting my interaction with participants”.*

However, as the interviews progressed my post-interview diary notes stated,

*“I am starting to worry less about control, I am more comfortable asking questions, following up with probes. I am also more comfortable restating their comments back to them, for confirmation, to see if I have it right. Embracing the teacher-learner role”.*

I was initially uncomfortable sharing the preliminary programme theories with interviewees, as I thought it might bias their responses, even though they were delivered at the end of the interviews after they had the opportunity to share their own thoughts and ideas. I needed to constantly remind myself of the teacher-learner relationship between the interviewee and the researcher within realist interviews (Pawson and Tilley 1997). After each interview, I reviewed the recordings of my summaries of the participant ideas during the interview, and my delivery of the preliminary programme theories to them, to train myself on how to do this in an effective manner and to check for leading statements or potential bias. This was particularly important to establish the confirmability of the study findings (Gasson 2004).

### **Gatekeeper Issues**

Accessing the study site involved an almost 4,000 mile round trip journey. The initial site at which I intended to conduct the study was much closer (400 miles one way) but was closed for renovation at the time of the study. The increased distance raised both the cost and time commitment for data gathering. However, the support of the faculty gatekeeper at the study site was invaluable in facilitating the success and efficiency of the data collection process (Clarke 2011).

I must note that I had initially intended to observe in the clinic, but was unable to secure access for observation. While I had approval for observation from the ethics board at the study site, and the faculty gatekeeper, the students were not comfortable with the idea of having an observer in the clinic. My request ignited a debate between the university administration and the students regarding research conducted in the clinic, touching on issues related to ownership of the clinic, and how research may play a part in its evaluation and development. Although I was eventually given access to observe, this was not until well after the data collection had been completed.

I had neglected to consider the role of the student clinic leaders as gatekeepers. I was aware that the students had a strong sense of ownership of the clinic but I had missed their importance in gaining clinic access. Gatekeepers are typically considered to be those individuals who have the authority to grant or withhold access to the study site (De Laine 2000, Crowhurst and Kennedy-macfoy, 2013), I came to realise the student-run nature of the clinic required the inclusion of the student leadership as gatekeepers. In future research work with SRCs, I would make sure to consider the role of the student leaders as gatekeepers.

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# Appendices

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## Appendix 1: Reviews of interprofessional education by Year of publication

<p><b>Zwarenstein, Atkins, Barr, Hammick, Koppel &amp; Reeves (1999)</b>  <b>A systematic review of interprofessional education</b></p> <p><u>Review Type:</u> Systematic Review (Cochrane Review)  <u>Focus:</u> IPE  <u>Population:</u> Post-professional  <u>Study question/aim:</u> Effect of IPE on collaborative working between professionals and quality and outcomes of patient care  <u>Selection Criterion:</u> Randomised controlled trials (RCT), controlled before and after studies (CBA), interrupted-time series studies (ITS)  <u>Outcomes:</u> Direct benefits to patients or changes in the service organization  <u>Key Findings:</u> No articles were retrieved that met the inclusion criterion  <u>Issues:</u> Lack of methodological quality limited inclusion of articles</p>
<p><b>Barr, Freeth, Hammick, Koppel, and Reeves (2000)</b>  <b>Evaluations of interprofessional education</b></p> <p><u>Review Type:</u> Parallel review  <u>Focus:</u> IPE  <u>Population:</u> Pre-licensure and post-professional  <u>Study question/aim:</u> To identify methods of IPE evaluation in the UK and assist others to replicate these methods  <u>Selection Criterion:</u> All quantitative, qualitative and multi-method approaches to evaluation of IPE  <u>Outcomes:</u> Any IP outcomes  <u>Key Findings:</u> 19 studies were included in the review which identified methods used to evaluate IPE in the UK  <u>Issues:</u> Identified a need to broaden the range of evaluation methodologies in use and include both process and outcome</p>
<p><b>Cooper, Carlisle, Gibbs &amp; Watkins (2001)</b>  <b>Developing an evidence base for interdisciplinary learning: a systematic review</b></p> <p><u>Review Type:</u> Systematic review  <u>Focus:</u> Interdisciplinary learning  <u>Population:</u> Pre-licensure  <u>Study question/aim:</u> Summarize the interdisciplinary education literature for undergraduate health professional students  <u>Selection Criterion:</u> study design not used as an inclusion criterion  <u>Outcomes:</u> Largely learner self-report  <u>Key Findings:</u> Included 30 studies. Positive self-reported student benefit from interdisciplinary education including, satisfaction, changes in knowledge, skills, attitudes, and beliefs, but effects on professional practice were not discernable.  <u>Issues:</u> A lack of methodological rigour, poorly developed outcome measures, with theory rarely used in development.</p>
<p><b>Reeves (2001)</b>  <b>A systematic review of the effects of interprofessional education on staff involved in the care of adults with mental health problems</b></p>

<p><u>Review Type:</u> Systematic review</p> <p><u>Focus:</u> IPE &amp; IPCP</p> <p><u>Population:</u> Post-professional, staff involved in the care of adults with mental health problems</p> <p><u>Study question/aim:</u> To assess the extent and quality of published evidence on the effect of IPE on staff that cares for adults with mental health problems.</p> <p><u>Selection Criterion:</u> Quantitative, qualitative and multi-method studies addressing care of adults with mental health issues</p> <p><u>Outcomes:</u> Learner self-report</p> <p><u>Key Findings:</u> Identified 19 papers. Positive self-reported satisfaction with the learning experience, skills, knowledge and behaviour change. Change in professional practice was identified in 6 studies.</p> <p><u>Issues:</u> Lack of rigorous evidence, limited information provided re programme description, methods, and care impact.</p>
<p><b>Zwarenstein, Reeves, Barr, Hammick, Koppel &amp; Atkins (2001)</b>  <b>Interprofessional education: Effects on professional practice and health care outcomes</b></p>
<p><u>Review Type:</u> Systematic review (Cochrane review)</p> <p><u>Focus:</u> IPE</p> <p><u>Population:</u> Pre-licensure</p> <p><u>Study question/aim:</u> Identify the effects of IPE on practice and health care outcomes</p> <p><u>Selection Criterion:</u> RCT, CBS, ITS, CCT</p> <p><u>Outcomes:</u> Patient functional and health status outcomes, hospital use, costs, death, and disease.</p> <p><u>Key Findings:</u> No studies met the inclusion criterion</p> <p><u>Issues:</u> Poor methodological quality of studies limited inclusion.</p>
<p><b>Freeth, Hammick, Koppel, Reeves &amp; Barr (2002)</b>  <b>A critical review of evaluations of interprofessional learning</b></p>
<p><u>Review Type:</u> Systematic review</p> <p><u>Focus:</u> IPE and IPCP</p> <p><u>Population:</u> Pre-licensure and post-professional</p> <p><u>Study question/aim:</u> Review evaluations of interprofessional learning</p> <p><u>Selection Criterion:</u></p> <p><u>Outcomes:</u> Mostly learner self-report</p> <p><u>Key Findings:</u> identified 53 studies. Positive outcomes reported of learner self-reported perceptions and attitudes.</p> <p><u>Issues:</u> Lack of studies with reliable methods</p>
<p><b>Zwarenstein, Reeves &amp; Perrier (2005)</b>  <b>Effectiveness of pre-licensure interprofessional education and post-licensure collaborative interventions</b></p>
<p><u>Review Type:</u> Systematic review</p> <p><u>Focus:</u> IPE and IPCP</p> <p><u>Population:</u> Pre-licensure and post-professional</p> <p><u>Study question/aim:</u> To examine the effectiveness of interventions aimed at improving collaboration between health professionals and care quality.</p> <p><u>Selection Criterion:</u> Primary studies</p> <p><u>Outcomes:</u> Care quality and outcomes of care</p> <p><u>Key Findings:</u> No pre-licensure and 14 post-professional studies met the inclusion criteria. Evidence of the impact of pre-licensure IPE on patient care was missing. Post-professional was limited, 9 studies showed a positive effect, statistically significant and clinically relevant outcomes (5 studies), and process change (4 studies).</p> <p><u>Issues:</u> Identified issues related to the evaluation of IPE in pre-licensure students.</p>

**Hammick, Freeth, Koppel, Reeves & Barr (2007)****A best evidence systematic review of interprofessional education: BEME Guide no.9**

Review Type: Systematic review

Focus: IPE

Population: Pre-licensure and post-professional

Study question/aim: To identify and review the strongest evidence for IPE, classify outcomes, address the impact of context and develop a narrative regarding mechanisms that underpin IPE outcomes.

Selection Criterion: Methodological criteria were not used as study inclusion criteria. Peer-reviewed papers involving formal IPE.

Outcomes: Learners reactions, knowledge, skills, or perceptions of, and attitudes to others, and changes in learner behaviours. Modified Kirkpatrick used to classify outcomes.

Key Findings: Developed the 3-P model (presage-process-product) for education development and delivery. Identified staff development as an important influence on effectiveness. IPE is well received, with a positive impact on knowledge and skill acquisition but less evidence is available on attitudes and perceptions towards others in the service delivery team

Issues: Use of the terminology of realist evaluation allowed new knowledge to be identified regarding some key mechanisms that act to influence the outcomes of IPE, including staff development, authenticity, and customization of IPE activities.

**Davidson, Smith, Dodd, Smith & O'Loughlan (2008)****Interprofessional pre-qualification clinical education: a systematic review**

Review Type: Systematic review (reported as a systematic review but is more of a narrative review as presented)

Focus: IPE, clinical education

Population: Pre-licensure

Study question/aim: To review the literature regarding IPE in the clinical or fieldwork setting for pre-licensure students.

Selection Criterion: Did not use methodological criterion for inclusion or exclusion purposes.

Outcomes: Study reported outcomes were classified using the Modified Kirkpatrick  
Key Findings: Included 25 papers, identified barriers and enablers for IPE in the clinical setting. Reported outcomes were generally positive, including learner reaction, modification of attitudes, perceptions, acquiring knowledge and skills, and behaviour change.

Issues: Varied programmes with inconsistent use of outcome evaluation approaches and tools. Better alignment of programme aims, objectives and outcomes is needed.

**Reeves, Goldman, Burton & Sawatzky-Girling, (2010a)****Synthesis of systematic review evidence of interprofessional education**

Review Type: Synthesis of systematic reviews

Focus: IPE

Population: Pre-licensure and post-professional

Study question/aim: To provide a synthesis and critical appraisal of the evidence for IPE in systematic review literature

Selection Criterion: systematic reviews of IPE

Outcomes: Any IPE or patient or system outcomes

Key Findings: This synthesis of 6 reviews indicated that IPE delivered in a variety of settings was generally well received by learners and enabled the acquisition of knowledge and skills necessary for collaborative working. Some evidence was also found IPE can improve the delivery of services and make a positive impact on care.



<p><u>Issues:</u> A number of methodological problems were found. IPE varied in terms of content, duration, and professional participation. Evaluation studies were of variable quality and captured a range of different outcomes.</p>
<p><b>Reeves, Zwarenstein, Goldman Barr, Freeth, Koppel &amp; Hammick (2010b)</b>  <b>The effectiveness of interprofessional education: Key findings from a new systematic review.</b></p>
<p><u>Review Type:</u> systematic reviews (Cochrane review -Update)  <u>Focus:</u> IPE  <u>Population:</u> Post-professional  <u>Study question/aim:</u> an update of an earlier systematic review (Zwarenstein et al., 1999). This paper aimed to add to the on-going development of evidence for IPE.  <u>Selection Criterion:</u> randomized controlled trials, controlled-before and-after-studies and interrupted time series studies of IPE were included.  <u>Outcomes:</u> Validated professional practice and healthcare outcomes.  <u>Key Findings:</u> While the first review found no studies that met its inclusion criteria, the updated review located 6 IPE studies (2 reported positive outcomes, 2 mixed, and 2 no effect). Identified some useful progress being made in relation to strengthening the evidence base for IPE.  <u>Issues:</u> Stresses the need for further rigorous mixed method studies of IPE to provide a greater clarity of IPE and its effects on professional practice and patient/client care. Identified a high degree of variability in IPE approaches.</p>
<p><b>Reeves, Goldman, Gilbert, Tepper, Silver, Suter &amp; Zwarenstein (2011)</b>  <b>A scoping review to improve conceptual clarity of interprofessional interventions</b></p>
<p><u>Review Type:</u> Scoping Review  <u>Focus:</u> IPE and IPCP  <u>Population:</u> Pre-licensure and post-professional  <u>Study question/aim:</u> To map the available literature in order to identify key concepts, theories and sources of evidence. The objective of this review was to develop a theoretically based and empirically tested understanding of IPE and IPCP.  <u>Selection Criterion:</u> methodological criterion not used for study selection.  <u>Outcomes:</u> specific outcomes of interest for the review were not identified.  <u>Key Findings:</u> A total of 104 studies met the criteria and were included for analysis. Studies were examined for their approach to conceptualization, implementation, and assessment of their interprofessional interventions. Half of the studies were used for interprofessional framework development and a half for framework testing and refinement. The final framework contains three main types of interprofessional interventions: IPE; interprofessional practice; and interprofessional organization; and describes the nature of each type of intervention by stage, participants, intervention type, interprofessional objectives, and outcomes. The outcomes are delineated as intermediate, patient, and system outcomes.  <u>Issues:</u> There was a very limited use of theory in the studies, and thus theoretical aspects could not be incorporated into the framework</p>
<p><b>Abu-Rish, Kim, Choe, Varpio, Malik, White, Craddick et al. (2012)</b>  <b>Current trends in interprofessional education of health sciences students: A literature review</b></p>
<p><u>Review Type:</u> Literature review  <u>Focus:</u> IPE  <u>Population:</u> Pre-licensure  <u>Study question/aim:</u> To explore current IPE models to identify emerging trends in strategies reported.  <u>Selection Criterion:</u> Studies that report IPE activities and use qualitative, quantitative and mixed-methods approaches.</p>

Outcomes: Any IP outcomes

Key Findings: Presented the key characteristics of 83 studies with a wide array of models and components. Student learning outcomes reported in most studies including professional roles, team communication, and satisfaction.

Issues: Many inconsistencies identified in implementation, assessment, reporting and conceptualizing of activities. Recommend specification of minimal reporting requirements for studies that develop or test IPE models.

**Reeves, Perrier, Goldman, Freeth, & Zwarenstein, (2013)**

**Interprofessional Education: Effects on professional practice and health care outcomes (update).**

Review Type: Cochrane Review

Focus: IPE

Population: Pre-licensure and post-professional

Study question/ aim: To assess the effectiveness of IPE interventions compared to separate, profession-specific education interventions; and to assess the effectiveness of IPE interventions compared to no education intervention.

Selection Criterion: Randomized controlled trials (RCTs), controlled before and after (CBA) studies and interrupted time series (ITS) studies of IPE interventions. Search Years 2006-2011.

Outcomes: Objectively measured or self-reported (validated instrument) patient/client or healthcare process outcomes.

Key Findings: This updated review reports on 15 studies that met the inclusion criteria (nine studies from this update and six studies from the 2008 update). Although these studies reported some positive outcomes, due to the small number of studies and the heterogeneity of interventions and outcome measures, it is not possible to draw generalizable inferences about the key elements of IPE and its effectiveness.

Issues: Small number of studies with marked heterogeneity of interventions and outcome measures. To improve the quality of evidence on IPE and patient outcomes or healthcare process outcomes, this study suggests the development of studies that assess the effectiveness of IPE interventions compared to separate, profession-specific interventions, use of RCT, CBA or ITS studies with qualitative strands examining processes relating to the IPE and practice changes, and the use of cost-benefit analyses.

**Brandt, Lutfiyya, King & Chioreso (2014)**

**A Scoping review of interprofessional collaborative practice and education using the lens of the Triple Aim**

Review Type: Scoping Review

Focus: IPE and IPCP

Population: Pre-licensure and post-professional

Study question/aim: Since 2008, have ICP/IPE literature been focussed on examining how these simultaneously improve population health outcomes, delivery of quality and safe healthcare and healthcare cost reduction? (P.394)

Selection Criterion: IPE focussed and addresses the components of the triple aim

Outcomes: Triple aim (population health outcomes, delivery of quality and safe healthcare and healthcare cost reduction)

Key findings: None of the 133 papers addressed all 3 items within the triple aim. None of the aims were evident in 108 articles, one aim, the patient experience, was addressed in 22 articles, and 3 articles addressed two aims, the patient experience, and population health. They concluded that the research from 2008 to 2013 does not demonstrate the desired impact on the elements of the Triple Aim: population health outcomes, delivery of quality and safe healthcare, and healthcare cost reduction.

Issues: The triple aim items are not being consistently addressed in study design.

**Olson and Bialocerkowski (2014)**

**Interprofessional education in allied health: a systematic review**

Review Type: Systematic review

Focus: IPE, in allied health, university-based IPE

Population: Pre-licensure

Study question/aim: To describe university-based models of IPE for allied health students and the associated outcomes.

Selection Criterion: Quantitative and qualitative methodologies

Outcomes: Not limited to, but including, process, and patient and client outcomes.

Key Findings: Included 17 studies. Outcomes measure in the studies included student attitudes to other health professions, roles of other professions, and teamwork.

Issues: Large gaps evident regarding methods, theory, and context in the literature were evident. Few studies used theory or include sufficient description of participants. Call on researchers to take account of contextual factors.

## Appendix 2: Search strategy terms, and data extraction sheets

**Search Terms:** The search terms were elicited from the study focus areas and included terms that had been consistently used by authors of previous scoping reviews and systematic reviews (e.g. Hammick et al. 2007; Reeves et al. 2010; Reeves et al 2011).

A series of literature searches were undertaken to perform the following reviews:

- A review of the impact of interprofessional collaborative practice
- A review of the outcomes of interprofessional education with a focus on pre-licensure students
- A review of the structure, function and outcomes of student-run clinics
- A review of the structure function and outcomes of interprofessional student run clinics

### Search Terms: Interprofessional education

Population	Educational level	Interprofessional	Education	Location
Health and social care students	Pre-registration	Interprofession\$ OR inter-profession\$	Educ\$	Practice\$
	Pre-licensure	Interdisciplin\$ OR inter-disciplin\$	Train\$	Clinic\$
	Pre-professional	Interoccupation\$ OR inter-occupation	Learn\$	Experien\$
	Pre-qualification	Interinstitut\$ OR interi-institut&	Teach\$	Immers\$
	Student\$	Interagen\$ OR inter-agen\$	Course\$	Emers\$
		Intersector\$ OR inter-sector\$	Program\$	Ward
		Interorgani\$ation\$ OR Inter-organi\$ation\$	Curricul\$	Hospital
		Interdepartment\$ OR Inter-department\$	Shared learning	Placement
		Multiprofession\$ OR multi-profession\$		
		Multidisciplin\$ OR multi-disciplin\$		
		Multioccupation OR multi-occupation		
		Multiinstitut\$ OR Multi-institut&		
		Multiagen\$ OR Multi-agen\$		
		Multisector\$ OR Multi-sector\$		
		Multiorgani\$ation\$ OR Multi-organi\$ation\$		
		Multidepartment\$ OR Multi-department\$		
		Cross-profession\$ OR Crossprofession\$		
		Transprofession\$ OR Trans-profession\$		
		Team\$		
		Collaborat\$		

**Search Terms: Student run clinic**

<b>Clinic</b>
Student-run\$ OR Student free clinic\$
Medical student clinic\$ OR Medical student free clinic\$
Interprofessional student-run clinic\$

**Data Extraction Sheet for SRC Literature Search**

Title	
Authors	
Year	
Abstract	
Country	
University housing the SRC	
Is it an SRC / Yes/No	
Designation as Medical SRC, interdisciplinary, Interprofessional, Other	
Professions involved	
Setting	
Student population	
Patient population	
Clinic frequency	
Clinic Purpose	
Description of IP activity	
IP theory use	
Study Method	
Study Quality	
Study outcomes	
Outcome measures used	
Key Findings	
Limitations	
NOTES	

**Appendix 3:** Publications related to interprofessional student-run clinics presented by author, year of publication and national setting

Year	Number	Authors	Term*	Country
1995	1	Yap and Thornton	MD	US
2001	1	Steinbach et al.	ID	US
2003	1	Clark et al.	MD	US
2004	1	Robinson et al.	ID	US
2005	1	Beck	TD	US
2006	1	<b>Moskowitz et al.</b>	<b>IP</b>	<b>US</b>
2010	5	Ellett et al.	IP	US
		<b>Khorasani et al.</b>	<b>IP</b>	<b>Canada</b>
		Morello et al.	IP	US
		Sheu et al.	IP	US
		<b>Shrader et al.</b>	<b>IP</b>	<b>US</b>
2011	5	Dugani and McGuire	IP	Canada
		<b>Guirguis and Sidhu</b>	<b>IP</b>	<b>Canada</b>
		Sheu et al.	IP	US
		Wee et al.	IP	Singapore
		Westra et al.	IP	US
2012	2	<b>Holmqvist et al.</b>	<b>IP</b>	<b>Canada</b>
		Sheu et al.	IP	US
2013	4	Kent and Keating	IP	Australia
		Ouyang et al.	IP	US
		VanderWielen et al.	IP	US
		Wang and Bhakta	IP	US
2014	8	<b>Buckley et al.</b>	<b>IP</b>	<b>Australia</b>
		Farokhi et al.	IP	US
		Haggarty and Dalcin	IP	Canada
		Haines et al.	IP	Australia
		<b>Seif et al.</b>	<b>IP</b>	<b>US</b>
		<b>Sick et al.</b>	<b>IP</b>	<b>US</b>
		<b>Vander-Wielen et al.</b>	<b>IP</b>	<b>US</b>
		Vildbrand and Lyhne	IP	Denmark
2015	10	<b>Ambrose et al.</b>	<b>IP</b>	<b>Canada</b>
		Danhausen et al.	IP	US
		Goodier et al.	IP	UK
		Kim and Lee	IP	Canada
		Lawrence et al.	IP	US
		Pammett et al.	IP	Canada
		Posada et al.	IP	US
		<b>Schwartz et al.</b>	<b>IP</b>	<b>US</b>
		Scott and Swartz	IP	US
		Weidmann	IP	UK

\*ID= interdisciplinary, MD = multi-disciplinary, IP = Interprofessional, TP = transprofessional

## Appendix 4: Study information sheet and informed consent

# A.T. STILL UNIVERSITY | ATSU

## Institutional Review Board – Arizona Adult Informed Consent Form for Minimal Risk Studies Study Information and Consent for Interview

### General Information

**Study Title:** Mechanisms, contexts, and outcomes of interprofessional clinical education for pre-qualification healthcare students in primary care settings – a realist approach to developing program theory.

**Principal Investigator:** Dr. Barbara Maxwell, P.T., DPT., MSc., FNAP.  
University Director of Interprofessional Education and Collaboration  
A.T. Still University,  
5850 E. Still Circle, Mesa Arizona, 85206.  
Telephone: 480 219 6109  
Email bmaxwell@atsu.edu

**Research Location(s):** *(include phone number)*

**Participant's Printed Name:**

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You are invited to be in a study titled: Mechanisms, contexts, and outcomes of interprofessional clinical education for pre-qualification healthcare students in primary care settings – a realist approach to developing program theory. This form provides information about the study and contact information. This study is being conducted by A.T. Still University, the lead researcher is also a PhD student at Bournemouth University. The purpose of this study is to increase understanding of how interprofessional programs for healthcare students in primary care settings are thought to work, in particular, this study is interested in uncovering what works, for whom, under what circumstances, in what respects, and why?

In attempting to answer these questions I will be interviewing individuals who designed and developed the program, those who deliver the, and students who experienced the program. I will also gather written information that describes the program, such as syllabi, program descriptions, information leaflets etc., and will also spend some time observing the program in action and will record field notes on those observations.

Dr. Barbara Maxwell will answer any questions you may have about being in the study.

The following organizations may have access to the study data: The A.T Still University and Bournemouth University Institutional Review Boards (committees that review and approve research studies), and The Office of Human Research Protections in the U.S. Department of Health and Human Services.

**Voluntary Participation:** Research studies include only people who volunteer. Before you decide if you want to be in this study, it is important that you understand why the study is being done and what will be involved. You may refuse to be in the

study. If you do not want to be in the study, you will not lose any current benefits. You may drop out of the study at any time without losing any current benefits. Or, the researcher may decide to end your participation early, if they think ending the study is in your best interest. If you want to end your participation in the study early, you should talk to Dr. Maxwell.

**Study Procedures:**

20 -25 people will be interviewed as part of this study.

If you agree to take part you will be asked to participate in an interview with the researcher during which you will be asked some questions about your experience as (insert role - a developer of/as a designer of/ delivering/ as a student in) the interprofessional program at (Insert site name).

This interview was designed to be approximately 30-45 minutes in duration. Please be assured that if there are any questions that you would prefer not to answer during the interview just say no and we will stop the interview or move on to the next question, whichever you would prefer.

The interviews will be audio recorded and transcribed. Your recording and transcript will be given a pseudonym to protect your identity and confidentiality. Any documents linking your name to the pseudonym will be kept in a locked filing cabinet in the researcher's office and will only be accessed by the researcher. All transcripts will be stored on a password-protected computer in the researcher's office. Audio recordings will be destroyed five years after the study has been completed.

You will be sent a copy of the report that summarizes the findings from all of the interview data and will have the opportunity to comment on the findings if you so wish.

**Study Risks:** There are some risks if you agree to be in this study.

While the methods employed in this study hold no potential to harm you physically, there may be potential for psychological harm in the form of perceived embarrassment or discomfort. You are being asked to open up your experiences and work to the researcher which involves the potential for you to feel that your work is being scrutinised or critiqued, and could potentially lead to some discomfort or embarrassment. The potential for such psychological harm will be addressed by ensuring that you are fully informed regarding the intent of the study. I will also work to maintain your confidentiality and protection of your identity by not using your real name on any recordings, transcripts of the interviews, or reports of the study, a pseudonym will be used to replace your name throughout the research data collection, analysis, and reporting.

Loss of confidentiality: the researcher will attempt to keep information about your study involvement and your interview comments private and in locked filing cabinets or password-protected computer files. However, confidentiality of your study information cannot be guaranteed 100%.

Principal Investigator name and contact details: Dr. Barbara Maxwell, P.T., DPT., MSc., FNAP. A.T. Still University, 5850 E Still Circle, Mesa Arizona, 85206.

Telephone: 480 219 6109      Email bmaxwell@atsu.edu

**Study Benefits:**

It is not anticipated that you will receive any direct benefit from being in this study however, the results of this research may guide the future development, delivery,



and evaluation of interprofessional clinical education in primary care settings by providing information that may help determine what works, for whom, in what circumstances in what respects and why?

**Study Payments:** There is no payment for being in the study.

**Consent to be in the Study:** Before making the decision to be in this study, you should discuss the study with Dr. Maxwell, review the information in this form, and have all of your questions answered. Your signature below means that you have received this information, have asked questions about the study and your questions have been answered. You will receive a copy of this form.

If you have any questions about your rights as a research participant you may contact the Chairperson of the A. T. Still University, Arizona, Institutional Review Board at 480-219-6000.

**Participant**

I have read the above statements and give my informed and free consent to be in this study.

\_\_\_\_\_  
Signature of Participant/Printed Name

\_\_\_\_\_  
Date

**Study Staff Member**

I, \_\_\_\_\_ certify that I have explained to the above individual the nature and purpose of the research study. I have provided the participant a copy of this consent document.

\_\_\_\_\_  
Signature of Person Conducting Consent Discussion

\_\_\_\_\_  
Date

# A.T. STILL UNIVERSITY | ATSU

## Institutional Review Board – Arizona Adult Informed Consent Form for Minimal Risk Studies Study Information and Consent for Observation

### General Information

**Study Title:** Mechanisms, contexts, and outcomes of interprofessional clinical education for pre-qualification healthcare students in primary care settings – a realist approach to developing program theory.

**Principal Investigator:** Dr. Barbara Maxwell, P.T., DPT., MSc., FNAP.

A.T. Still University,

5850 E. Still Circle, Mesa Arizona, 85206.

Telephone: 480 219 6109

Email bmaxwell@atsu.edu

**Research Location(s):** *(include phone number)*

**Participant's Printed Name:**

---

You are invited to be in a study titled: Mechanisms, contexts, and outcomes of interprofessional clinical education for pre-qualification healthcare students in primary care settings – a realist approach to developing program theory.

This form provides information about the study and contact information. This study is being conducted by A.T. Still University, the lead researcher is also a PhD student at Bournemouth University. The purpose of this study is to increase understanding of how interprofessional programs for healthcare students in primary care settings are thought to work, in particular, this study is interested in uncovering what works, for whom, under what circumstances, in what respects, and why?

In attempting to answer these questions I will be interviewing individuals who designed and developed the program, those who deliver the program, and students who experience the program. I will also gather written information that describes the program, such as syllabi, program descriptions, information leaflets etc., and will spend some time observing the program in action and will record field notes on those observations.

Dr. Barbara Maxwell will answer any questions you may have about being in the study.

The following organizations may have access to the study data: The A.T Still University and Bournemouth University Institutional Review Boards (committees that review and approve research studies), and The Office of Human Research Protections in the U.S. Department of Health and Human Services.

**Voluntary Participation:** Research studies include only people who volunteer.

Before you decide if you want to be in this study, it is important that you understand why the study is being done and what will be involved. You may refuse to be in the study. If you do not want to be in the study, you will not lose any current benefits.

You may drop out of the study at any time without losing any current benefits. Or, the researcher may decide to end your participation early, if they think ending the

study is in your best interest. If you want to end your participation in the study early, you should talk to Dr. Maxwell.

**Study Procedures:**

**Observation**

The researcher will be present and will be observing the interprofessional program and taking some notes about what is observed.

Who will be observed?

The interprofessional student team and their supervisors will be observed as they go about their regular interprofessional activities.

Where will they be observed?

Observations will take place at (Insert name of facility) where the interprofessional activity is delivered.

When will they be observed?

Observation will occur during the regularly scheduled hours of the interprofessional program for approximately 2 hours at a time.

What will be observed?

Observation will focus on interactions between the members of the team, the activities they are engaged in, the context, and to observe the program as it unfolds in practice.

How will the observations be recorded?

Observations will be recorded as field notes. Pseudonyms will be used during observations to protect the confidentiality of all participants. Your real name will not be used in any field notes.

**Study Risks:** There are some risks if you agree to be in this study.

Loss of confidentiality: the researcher will attempt to keep information about your study involvement confidential. Your signed consent form will be stored in a locked filing cabinet in the researcher's office that can only be accessed by the researcher.

All observation notes will use a pseudonym and not your real name. However, confidentiality of your study information cannot be guaranteed 100%.

Principal Investigator name and contact details: Dr. Barbara Maxwell, P.T., DPT., MS., FNAP. A.T. Still University, 5850 E Still Circle, Mesa Arizona, 85206.

Telephone: 480 219 6109 Email [bmaxwell@atsu.edu](mailto:bmaxwell@atsu.edu)

**Study Benefits:**

It is not anticipated that you will receive any direct benefit from being in this study however, the results of this research may guide the future development, delivery, and evaluation of interprofessional clinical education in primary care settings by providing information that may help determine what works, for whom, in what circumstances in what respects and why?

**Study Payments:** There is no payment for being in the study.

**Consent to be in the Study:** Before making the decision to be in this study, you should discuss the study with Dr. Maxwell, review the information in this form, and have all of your questions answered. Your signature below means that you have received this information, have asked questions about the study and your questions have been answered. You will receive a copy of this form.

If you have any questions about your rights as a research participant you may contact the Chairperson of the A. T. Still University, Arizona, Institutional Review Board at 480-219-6000.

**Participant**

I have read the above statements and give my informed and free consent to be in this study.

\_\_\_\_\_  
Signature of Participant/Printed Name

\_\_\_\_\_  
Date

**Study Staff Member**

I, \_\_\_\_\_ certify that I have explained to the above individual the nature and purpose of the research study. I have provided the participant a copy of this consent document.

\_\_\_\_\_  
Signature of Person Conducting Consent Discussion

\_\_\_\_\_  
Date

## Appendix 5: Interview guide

### Interview Guide

Interview Phase	Preparation of interviewee: example introductory remarks		
<b>Apprehension phase:</b> The development of rapport between the interviewer and interviewee	<p>Explanation of the nature and general format of the interview.</p> <p>Identify the role of the researcher</p> <p>Please take your time in thinking and responding to questions and feel free to ask if you need clarification on any question. There are no right or wrong answers, the aim is to hear your experiences</p> <p>This interview should take between 30 and 45 minutes</p> <p>Review and signature of informed consent, including a discussion regarding the interview recording, confidentiality, and anonymity</p>		
Interview Phase	Realist focus	Question	Interview Strategy
<b>Apprehension phase:</b> Initial interview questions	Programme description and identification of programme components	<p>It would be really helpful if you could describe the clinic?</p> <p>What was your part in it?</p> <p>What would you say are the key components of the clinic?</p>	General conversation prior to the interview to assist in developing rapport. Careful attention to the wording of the opening question – focused, open-ended question, regarding something familiar and easy to recall for the interviewee. May be followed by a <i>prompt</i> that repeats the key concept.
<b>Exploration phase:</b> The interviewee begins to engage in more in-depth discussion	Outcomes attached to the programme components	<p>What is the purpose of the clinic?</p> <p>What outcomes did you expect? (Designer)</p> <p>Did the experience change anything for you? (Participant outcome)</p> <p>What about for others? (Observed outcomes)</p> <p>Tell me about those the clinic worked well for?</p> <p>What about those it didn't work do well for?</p>	Open-ended questions and <i>probing</i>
<b>Co-operative phase:</b> Increasing comfort level of the interviewee	Mechanisms	<p>What do you think led to that positive/negative outcome for you / for them? What did that make them think?</p> <p>Probing questions about reasoning</p>	Introduction of more complex or sensitive topics
<b>Participation phase:</b> Greatest rapport between the interviewer and interviewee. The interviewee is guiding and teaching the interviewer.	Contexts and connections between CMO	<p>Where there any particular circumstances that were needed to produce that outcome? How did that change the outcome for you/ for them?</p> <p>Was there anything that supported or hindered the success of the clinic for you/for others?</p>	Active listening and probing for detail
<b>Present evolving CMO theories</b>	<p>Researcher summarises comments from the interview and feedback to the interviewee for confirmation or refinement.</p> <p>Present evolving CMO theories from the previous set of interviews – asking them to refute, support, amend</p>		
<b>Concluding the Interview</b>	<p>Is there any additional information that you would like to add?</p> <p>Thank the participant and acknowledge the value of their participation</p> <p>Remind the interviewees that a copy of the data analysis will be provided to them</p>		
<b>Post Interview Reflexivity</b>	Interviewer documents notes and reflections on the interaction		