

**Interprofessional education programme to develop
teamwork among undergraduate healthcare students
during community fieldwork**

by

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Declaration

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SUMMARY

Interprofessional education (IPE) has been identified as a strategy to overcome some challenges healthcare is facing throughout the world. Different professionals with a variety of skills are required for comprehensive and cost-effective healthcare.

An IPE programme was developed for and implemented with the undergraduate final-year occupational therapy students, speech therapy students and physiotherapy students in a care centre in a community. The purpose of the IPE programme was to teach these healthcare students how to function effectively within an interprofessional team.

The main aim of the study was to determine the influence of the exposure to the IPE programme on the development of the final-year healthcare students as interprofessional team members. The aim was reached as the study indicated that the students' exposure to the IPE programme improved their ability to function as interprofessional team members. The aim of the study is more clearly described through the objectives of the study. The objectives were answered by generating qualitative data and collecting quantitative data. A multi-method research design was therefore used.

Qualitative data of the final-year healthcare students' expectations before the implementation of the IPE programme and the students' experiences after the implementation of the IPE programme were generated by means of reflective essays. A clinical supervisor was also invited to complete a reflective essay about her experiences of the students' interprofessional teamwork. The essays were thematically analysed and themes emerged from the data. The findings of the study indicated three main themes. The first theme was the outcomes of IPE as experienced by the students. The second theme identified an optimal environment for the facilitation of teamwork and the third theme identified certain attributes that team members need for effective teamwork. The second and third theme were identified as the elements that led to the outcomes described in theme one. The clinical supervisor's reflective essay was used to support the themes that emerged and not used as primary data.

Quantitative data of the healthcare students' experiences of the quality of teamwork were collected before and after the implementation of the IPE programme with the use of a summarised Teamwork Quality (TWQ) Scale. The scale is used to measure the quality of teamwork and consists of ten categories, namely communication, co-ordination, contribution, mutual support, effort, cohesion, effectiveness, efficiency, work satisfaction and learning. The two sets of quantitative data collected were compared by using the related-samples Wilcoxon signed rank test of the Statistical Package for Social Sciences (SPSS) for Windows, Version 23.0 Chicago: SPSS Inc. The results indicated an improvement in all ten categories with significant improvement in eight of the categories namely co-ordination, contribution, mutual support, effort, cohesion, effectiveness, efficiency and work satisfaction.

The researcher kept a reflective journal during the entire research process to clearly state her position in the process as she developed and implemented the IPE programme.

The study indicated that the students experienced the IPE programme as a means to improve their ability to function as interprofessional team members. The limitations of the study are mentioned in the last chapter. The researcher also made recommendations for IPE developers as well as similar future IPE research.

Keywords

Interprofessional education, teamwork, interprofessional team members, healthcare students, undergraduate, multi-method, qualitative, quantitative, development, community

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LIST OF ABBREVIATIONS

AKU 400:	Occupational Science module: Final-year occupational therapy module
FTP 400:	Physiotherapy: Final-year physiotherapy module
IPE:	Interprofessional education
KMP 483:	Human Communication Module: Final-year speech therapy and audiology module
OT:	Occupational therapy
POL 400:	Professional development and leadership: Final-year physiotherapy module
PT:	Physiotherapy
ST:	Speech Therapy
WHO:	World Health Organization

1 CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

1.2 BACKGROUND

1.3 PROBLEM STATEMENT

1.4 RESEARCH QUESTIONS

1.5 RESEARCH AIM AND OBJECTIVES

1.6 CONCEPTS CLARIFICATION

1.7 SIGNIFICANCE AND CONTRIBUTION

1.8 SCOPE AND DELIMITATIONS

1.9 DISSEMINATION OF THE RESEARCH

1.10 OVERVIEW OF CHAPTERS

“Interprofessional education and collaborative practice can play a significant role in mitigating many of the challenges faced by the health system around the world.”

World Health Organization (WHO) 2010¹

1.1 INTRODUCTION

Worldwide the health system is facing challenges such as a shortage of healthcare professionals and an increase in the complexity of healthcare.² Teamwork has been identified, by prominent healthcare organisations such as the World Health Organization (WHO), as one of the strategies to overcome some of these health related challenges.²

Teamwork is a highly skilled action.³ The need to teach healthcare students to function optimally in a team is therefore emphasised increasingly in institutions of higher education.^{1,4,5} Interprofessional education (IPE) is the identified educational

strategy that aims to enhance the knowledge, skills and behaviour needed for improved teamwork among health professionals.¹

Chapter 1 aims to set the scene for the research study. An overview of the background is discussed, followed by the problem statement, research questions, research aims and objectives, concepts clarification, significance and contribution, scope and delimitation, dissemination of results and finally ending with an overview of the chapters.

1.2 BACKGROUND

Teamwork among healthcare professions for comprehensive patient care has become the emphasis not only internationally but also in the South African context.^{4,6} The University of Pretoria is recognised as an institution that strives to provide cutting-edge education for healthcare professionals.⁷ The vision of the University of Pretoria's strategic plan for 2025 describes what it would like to achieve by then. The mission statement of the strategic plan states the following: "In pursuing recognition and excellence in its core functions of research, teaching and learning, and integrating engagement with society and communities into these, the University of Pretoria will use quality, relevance, diversity and sustainability as its navigational markers."⁷ The IPE programme falls within the markers of the strategic plan for 2025 as the study will establish up-to-date teaching and learning methods for students, in line with the current international trends. The strategic plan further promotes collaboration among the students of different healthcare professions involved as well as providing optimal healthcare services to the identified communities.

The Department of Occupational Therapy, similar to other departments at the University of Pretoria, strives to provide the best educational opportunities for its students. Interdisciplinary team efforts from these departments have been promoted for a number of years already. One of these opportunities presented itself in 2012. Final-year occupational therapy students, physiotherapy students and speech therapy students from the University of Pretoria were expected to follow an interdisciplinary team approach during their fieldwork practical at a care centre in a

community to the east of Pretoria. Children mainly diagnosed with cerebral palsy are cared for at the centre.

Each of the students from the different disciplines had their own role within the team. An example of the different roles performed within the team could have been during feeding time when the occupational therapy students and physiotherapy students were responsible for the positioning of the child while the speech therapy students conducted therapeutic feeding with the child. Another example could be when the occupational therapy students had to use vestibular stimulation to increase the level of arousal of the child so that the speech therapy students could facilitate communication. The physiotherapy students assisted with the positioning of the child. The physiotherapy students also treated pulmonary complications which assisted the team to treat the children holistically.

1.3 PROBLEM STATEMENT

Until recently the tendency was for healthcare students to be educated in silos even though it is expected of entry level healthcare professionals to be able to function within a team. When healthcare students are educated in silos the students tend to have little exposure to other professionals, which make collaboration difficult.³

As mentioned previously, the final-year undergraduate occupational therapy students, physiotherapy students and speech therapy students at the University of Pretoria are expected to function within an interprofessional team at a care centre in a community to the east of Pretoria. No formal educational strategy was however previously used to teach these students how to function within a team at this care centre.

The researcher identified the need to first develop an IPE programme for these students and then to implement this programme to develop individual discipline-specific healthcare students into interprofessional team members. The IPE programme, specific to this setting, was developed and finalised by the researcher at the beginning of 2015.

1.4 RESEARCH QUESTIONS

The need to implement an IPE programme led the researcher to explore the following research questions:

1.4.1 Primary question

What is the influence of exposure to an IPE programme on the development of the final-year healthcare students as interprofessional team members in a community setting?

1.4.2 Secondary question

Secondary questions were posed in two distinct phases: Phase one, before the IPE programme was implemented and Phase two, after the IPE programme has been implemented.

Phase one

1. What are the expectations of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students with regard to interprofessional teamwork before exposure to the IPE programme?
2. What are the experiences of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students with regard to the quality of teamwork before exposure to the IPE programme?

Phase two

1. What are the experiences of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students of interprofessional teamwork after exposure to the IPE programme?
2. What are the experiences of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students with regard to the quality of teamwork after exposure to the IPE programme?
3. What are the experiences of the speech-and-audiology clinical supervisor with regard to interprofessional teamwork during exposure to the IPE programme?

1.5 RESEARCH AIM AND OBJECTIVES

1.5.1 Aim

To determine the influence of the exposure to an IPE programme on the development of the undergraduate final-year healthcare students as interprofessional team members in a community setting.

1.5.2 Objectives

Phase one: Base-line evaluation

1. To determine the expectations of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students with regard to interprofessional teamwork before exposure to the IPE programme.
2. To determine the undergraduate final-year occupational therapy students', physiotherapy students' and speech therapy students' perceptions of the quality of teamwork before exposure to the IPE programme.

Phase two: Re-evaluation

1. To determine the experiences of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students with regard to interprofessional teamwork after exposure to the IPE programme.
2. To determine the undergraduate final-year occupational therapy students', physiotherapy students' and speech therapy students' perceptions of the quality of teamwork after exposure to the IPE programme.
3. To determine the experiences of the speech-and-audiology clinical supervisor with regard to interprofessional teamwork during exposure to the IPE programme.

1.6 CONCEPT CLARIFICATION

Concepts used in this study will be explained in the following section.

1.6.1 Interprofessional and interprofessional Education programme

Concepts such as multiprofessional, multidisciplinary, interprofessional and interdisciplinary are often used interchangeably in literature and can cause confusion among readers.⁸⁻¹⁰ The term “interprofessional” was more prominently used in literature after 2002.¹¹⁻¹³ This was due to the work of the United Kingdom Centre for the Advancement of Interprofessional Education (CAIPE). In 2006 this definition developed by the CAIPE was revised as “those occasions when members (or students) of two or more professions learn with, from and about one another to improve collaboration and the quality of care”.¹⁴ The WHO also identified interprofessional as a suitable term in “The WHO report: Framework for action on IPE and collaborative practice” published in 2010. The WHO (2010) states that “IPE occurs when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes”.¹

The terms interprofessional and interprofessional education (IPE) were identified as more prominent words in literature and was therefore, used in this study. In this context an IPE programme is used to teach undergraduate final-year occupational therapy, speech therapy and physiotherapy students of the University of Pretoria to function effectively in a team.

1.6.2 Teamwork

The definition of teamwork described by Brill¹⁵ is used widely in literature. Brill defined teamwork as “that work which is done by a group of people who possess individual expertise, who are responsible for making individual decisions, who hold a common purpose and who meet together to communicate, share and consolidate knowledge from which plans are made, future decisions are influenced, and actions determined”.¹⁵ In 2008, Xyrichis and Ream¹⁶ published an article on a concept-analysis completed about teamwork in healthcare. They defined teamwork as “a dynamic process involving two or more health professionals with complementary backgrounds and skills, sharing common health goals and exercising concerted physical and mental effort in assessing, planning, or evaluating patient care. Teamwork is accomplished through interdependent collaboration, open

communication and shared decision-making. This in turn generates value-added patient, organizational and staff outcomes.”¹⁶ Words such as collaboration and team relations are often used interchangeably to refer to teamwork.¹⁶

Teamwork in this study refers to the definition explained by Xyrichis and Ream.¹⁶ During teamwork the healthcare students work towards the same healthcare goals through “collaboration, open communication and shared decision-making”¹⁶ by means of assessing, planning, or evaluating the needed healthcare.

1.6.3 Community

According to the Cambridge dictionary, community could be defined as “people living in one particular area or people who are considered as a unit because of their common interests, social group or nationality”.¹⁷

In this study interprofessional teamwork are conducted at a care centre in a community in the east of Pretoria. The community in this study refers to a social group of people with common interests of the same nationality.

1.6.4 Occupational therapy students

Occupational therapy is a healthcare profession that assist clients in health and well-being through occupation. Occupational therapists treat clients in a holistic manner in order for clients to achieve optimal functioning within their own communities in occupations that are meaningful to them. Occupational therapists also educate individuals and families, teach clients skills, adapt the environment and modify their activities to assist clients to achieve optimal participation and independent functioning. Occupational therapists work with people of all ages as well as clients with physical, psychosocial, developmental or learning disabilities.¹⁸

The occupational therapy students referred to in this study are undergraduate final-year students of the University of Pretoria who work within a team with final-year physiotherapy students and final-year speech therapy students in order to treat children with cerebral palsy at a care centre in a holistic manner.

1.6.5 Physiotherapy students

Physiotherapy is a health care profession for the treatment of physical dysfunction to restore the performance or development of individuals. Physiotherapists use various modalities and therapeutic exercises as intervention strategies. Physiotherapist also work with people of various ages.¹⁹

The undergraduate final-year physiotherapy students have an important role to play as part of the healthcare team especially with children diagnosed with cerebral palsy. Children diagnosed with cerebral palsy often have movement and postural difficulties as well as concurrent lung complications which physiotherapists treat.

1.6.6 Speech therapy students

Speech therapy is a profession specialising in “assisting patients in overcoming speech and language disorders”. Speech therapists treat “speech defects and disorders” by making use of various exercises and different audio-visual aids. These aids will assist patients to “develop new speech habits”.¹⁹ Speech therapy also assists patients with feeding difficulties. The undergraduate final-year speech therapy students are therefore involved in facilitating interaction and communication as well as assisting caregivers with feeding of the children at the care centre.

1.6.7 Healthcare students

In this study healthcare students refer to the undergraduate final-year students from occupational therapy, physiotherapy and speech therapy.

1.7 SIGNIFICANCE AND CONTRIBUTION TO THE SCIENTIFIC BODY OF KNOWLEDGE

The knowledge obtained after completion of this study will be used to assist the Departments of Occupational Therapy, Physiotherapy and Speech-Language Pathology and Audiology at the University of Pretoria to continue providing cutting-

edge learning opportunities for undergraduate healthcare students for the purpose of functioning effectively in a team. According to literature, IPE is expected to have a direct positive effect on the personal and professional development of the students to foster optimal client care.²⁰ IPE has the potential to improve collaboration among the healthcare students and improve client care at the particular care centre.²¹

The information gained in this study is expected to contribute to the mission of the University of Pretoria's strategic plan for 2025 where the three core aspects include excellent research, exceptional teaching and learning as well as effective community engagement.⁷ The information obtained in this study could guide academics on how to teach healthcare students to function within a team. Improved interprofessional teamwork could also benefit children at the centre where the research took place.

In general, the study could contribute by adding new knowledge about IPE in the South African context and confirming existing knowledge in the IPE field. Even though the study has been developed for a specific setting and for final-year healthcare undergraduate students studying at the University of Pretoria, this study might contribute to implementing IPE in institutions of higher education with similar student groups and settings.

1.8 SCOPE AND DELIMITATION OF THE RESEARCH

The study determined the influence of exposure to the IPE programme with regard to the development of the final-year undergraduate healthcare students by the use of a multi-method approach. The study did not evaluate the competencies and professionalism of the students as interprofessional team members, but focused on the influence that the IPE programme can have on the development of the healthcare students as interprofessional team members.

The population sample only included final-year undergraduate healthcare students from three disciplines at the University of Pretoria, who were expected to deliver services at this particular setting. Students who enrolled for their respective modules, such as Occupational Science 400, Physiotherapy 400, Professional Development and Leadership 400 and Human Communication 483, are expected to provide a

service to this specific care centre. The study was only conducted over a four-week period with one contact session per week resulting in four sessions.

1.9 DISSEMINATION OF RESEARCH FINDINGS AND RESULTS

Valuable findings and results will be disseminated on three levels namely in the form of research outputs, through feedback to the departments involved and through feedback to the care centre where the research took place.

1.9.1 Research outputs

An academic article will be submitted to a relevant South African or international peer-reviewed journal with the research findings and results obtained through this study. The researcher also plans to present the findings, results and recommendations at a workshop, conference or congress.

1.9.2 Feedback to the Departments at the University of Pretoria

Feedback will also be provided verbally, in writing or in the form of a presentation to all the departments involved in the study.

1.9.3 Feedback to the care centre

The relevant findings and results will be shared with the care centre. Even though the focus of this study was not the centre, suggestions from them will be encouraged. The centre's suggestions will be taken into account when changes are made to the IPE programme to guide students to develop as interprofessional team members on a professional and personal level and ultimately to benefit children.

1.10 OVERVIEW OF CHAPTERS

Chapter 2 focuses on the literature related to IPE.

Chapter 3 covers the research design, methodology, pilot study, trustworthiness, validity and reliability as well as ethical considerations of the study.

In Chapter 4 the findings of the qualitative data are described by making use of the themes identified through thematic analysis. The literature related to the themes that emerged from the qualitative data is also discussed in this chapter.

Chapter 5 explains the quantitative results. The results and the literature related to the results obtained are also discussed.

Finally in Chapter 6, the researcher provides the conclusion and reflection on the study and discusses the recommendations for future research.

2 CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

2.2 BACKGROUND TO INTERPROFESSIONAL EDUCATION

2.3 BODY OF KNOWLEDGE OF INTERPROFESSIONAL EDUCATION

2.4 CHALLENGES DURING THE DEVELOPMENT AND THE IMPLEMENTATION OF INTERPROFESSIONAL EDUCATION

2.5 CONCLUSION

2.1 INTRODUCTION

The purpose of this chapter is to guide the reader through available literature related to interprofessional education (IPE). The background to the emerging of IPE will be discussed first. Thereafter the literature related to IPE and how it relates to the study will follow.

2.2 BACKGROUND TO INTERPROFESSIONAL EDUCATION

The goal of providing comprehensive, effective and efficient healthcare has been the driving force of health-related research for centuries.¹ Challenges around the world such as the shortage of healthcare professionals, the increased complexity of patient care, poor service delivery and increased healthcare costs make the goal of obtaining comprehensive and effective healthcare difficult. Policy makers are always on the lookout for better strategies to overcome healthcare challenges.^{1,22,23}

IPE has been identified as a possible strategy to overcome challenges in healthcare by improving teamwork in healthcare, subsequently providing improved, comprehensive healthcare.¹ Healthcare professionals working together have increased knowledge and skills available with the potential of providing

comprehensive and cost-effective healthcare²⁴ that can ultimately improve patient care.³ These healthcare professionals need to collaborate in a team to provide optimal patient care.²⁵ Teamwork could therefore form a part of the solution for current healthcare challenges.¹

Teamwork requires skilled action.³ Knowledge and skills are essential to function effectively within a team.²¹ In the past healthcare professionals were mainly educated in silos. The little exposure to other professionals made learning about the different roles of professionals as well as collaboration difficult. The lack of collaboration in turn may have contributed to negative stereotyping of other professionals.³ Hence, the need to train healthcare students to function optimally in a team is emphasised increasingly in literature.¹ This growing emphasis initiated the emergence of IPE – an educational strategy to establish skills, attitudes and behaviours essential for teamwork during undergraduate and postgraduate education.^{21,24,26,27} IPE was suggested as a possible strategy to overcome the challenges the health system is faced with at the moment.¹ For the University of Pretoria to be part of the solution in overcoming challenges in the healthcare system, this study consequently focused on IPE. Available literature related to interprofessional education is discussed in the sections below.

2.3 BODY OF KNOWLEDGE OF INTERPROFESSIONAL EDUCATION

IPE has been a research interest field for quite a number of years and a substantial amount of knowledge has been produced about this field up to date.¹ The researcher has been reading literature related to IPE intensely for the last three years. Freeth and Reeves²⁸ and Hammick *et al.*²³ recommend the use of the 3P-model when literature related to IPE are discussed. The 3P-model is an analytical tool for learning and teaching to “provide a structure to analyse influences upon and within learning opportunities”.²⁸ Hammick *et al.*²³ suggest that IPE developers should understand the knowledge available by making use of the 3P-model and must continue to add evidence-based knowledge to strengthen the IPE knowledge-base. The 3P-model with the headings 1) Presage, 2) Process and 3) Product will therefore be used in

this chapter to provide a summary of the current knowledge-base of IPE.²³ Table 2.1 lists the outlay of the 3P-model.

Table 2.1: The 3P-model

P1: Presage	P2: Process	P3: Product
Context	Content of programme	Outcome and benefits
Facilitators' characteristics	Educational approaches and methods	

Each of the Ps (Presage, Process and Product) of the 3P-model will now be discussed.

2.3.1 P1: Presage

Presage represents the first 'P' in the 3P-Model. "Presage factors exist before the learning experiences and influences the creation, conduct and outcomes of learning experiences."²⁸ Presage can be subdivided into two categories, namely 1) the context of IPE and 2) the characteristics of facilitators.

2.3.1.1 Context

The first category in Presage consists of the context of IPE. The context of IPE comprises the drivers of IPE, the suggested time to introduce IPE, the professions involved as well as the setting and duration of IPE.

Drivers of interprofessional education

IPE is encouraged by top-down drivers as well as bottom-up drivers. The assumption that IPE is effective is widely supported.¹

The top-down drivers include organisations such as the WHO and institutions of higher education. As a result of an international trend, the WHO published

“The WHO report: Framework for action on IPE and collaborative practice” (2010).¹

Institutions of higher education, their leaders and staff also play an important role in the initiation and the success of IPE. Support is needed from the various institutions of higher education before IPE could be implemented because significant changes in the curriculum structure are often required.^{8,23,29} Institutions should therefore be committed and dedicated when IPE is implemented.^{29,30} Firstly, administrative support is essential to “schedule rooms, confirm mentor availability, submit attendance and grades and find substitutes when necessary”.²⁹ Lecture halls providing adequate space are needed for these interprofessional activities.²⁹ Lastly, managerial commitment is essential but requires patience and perseverance as co-ordinating timetables have proven to be challenging.¹

The bottom-up drivers of IPE are the healthcare professionals who identify the need for teamwork to provide optimal and effective care to patients with complex health-related problems.²³ Combined, top-down and bottom-up drivers can form a task team that are enthusiastic and share the same vision and understanding when developing an IPE programme.²⁹

In this study the researcher was the top-down driver (representing an institution of higher education in this context) for the purpose of enhancing interprofessional teamwork among undergraduate final-year healthcare students of the University of Pretoria.

Timing of interprofessional education

The best time to introduce IPE during a learning continuum is unclear. On the one end of the continuum, Bridges *et al.*²⁹ state that it is essential for students to develop a framework for interprofessional interaction early on during their undergraduate studies to understand the complexity of the relationships within a team. Also, the systematic review conducted by Hammick *et al.*(2007) found that most of the 21 IPE articles reviewed involved IPE at an undergraduate level.²³ This fact was confirmed by the WHO 2010 report where the IPE

programmes were found to be relatively evenly distributed between all the year groups.¹ Though some literature indicates IPE to be introduced early on, Mandy A., Milton and Mandy D.³¹ indicate that negative stereotypical behaviour was reinforced during early exposure to IPE.

On the other side of the continuum, Mariano³² argues that team members first need to establish a discipline-specific foundation of knowledge and skills before they could function effectively within a team. In the study completed by Cooper, Carlisle, Gibbs and Watkins³³, the majority of students were found to have positive attitudes towards teamwork during their early learning experiences.

The ongoing debate about the exact time for IPE to be introduced in undergraduate studies is therefore still undecided.

In this study IPE is introduced in the final year of the healthcare students' undergraduate studies. Whether this is the best time to introduce IPE to this specific student groups is not clear and should be investigated. The decision was made purely from a practical point of view.

Professions involved

Professions involved in IPE at institutions of higher education include a variety of student groups related to health and social care. The WHO 2010 report found that student groups studying health, medicine, midwifery, nursing and social work participate in IPE. Interprofessional education was also found to be compulsory in most of the studies.¹

According to the review of 30 IPE articles completed by Cooper *et al.*³³, medical and nursing students were found to participate the most in these programmes. Other student groups commonly included are those in the field of social work, pharmacy, dentistry, laboratory science, speech therapy, dietetics, audiology, occupational therapy, physiotherapy, health administration, chiropractic and psychology.

The student groups identified by Hammick *et al.*²³ were all in the medical, nursing, physiotherapy, pharmacy, occupational therapy, dentistry, social work and midwifery professions field. To decrease the complexity of such an educational programme it was advised that no more than four professions should be involved at a time.²³

Literature makes it clear that a variety of professions could be involved in IPE. The occupational therapy students, speech therapy students and physiotherapy students are the three professions involved in this study.

Setting

The setting where IPE is implemented also “influences the creation, conduct and outcomes of learning experiences”.²⁸ The setting therefore depends on the proposed outcomes of IPE in a certain context.

IPE could take place across healthcare settings.¹ These settings could vary from classrooms, communities to hospitals.³³ It is suggested that sufficient physical space should be available to facilitate collaboration.¹ For example, a quiet, private space is needed when a team member discusses sensitive matters with a family.³⁴ IPE should also be conducted in a “safe, structured and supportive environment”²³ and for effective teamwork a “co-operative, non-judgemental” environment should be created.³⁵

Authenticity is essential for learning therefore IPE should be customised to the relevant setting and service delivery environment.²³ The learning environment should reflect the reality of service delivery as closely as possible.²³ Learning in an authentic and relevant work setting is markedly more likely to improve the quality of health outcomes than didactic learning methods.³⁶ Experiential workshops with simulated patient scenarios were also found as a valuable learning experience as these simulations create a safe environment.³⁷

Consequently, the outcomes of IPE have to guide the setting for IPE to be implemented in. As the purpose of IPE in this study is to enhance teamwork in

the clinical field, literature suggests the setting should be relevant to the different future work settings of healthcare professionals.

Duration of interprofessional education exposure

The duration of IPE courses ranges from single short sessions to an entire course created for IPE. The majority of courses continue for approximately four weeks.³³

According to Mu *et al.*²⁵, there is a direct relation between longer IPE programmes and the positive effects on the perceptions of students. The students' positive perceptions intensified with longer IPE programmes.²⁵ On the contrary, Crutcher *et al.*³⁸ found that brief exposure to IPE programmes can also produce significant changes in attitudes and role definition.³⁸

For this study, the duration of the implementation of the IPE programme was three contact sessions of approximately three hours per session over a three week period. The decision was largely based on practical considerations.

2.3.1.2 Characteristics of facilitators

The second category in Presage is the characteristics of facilitators in IPE. Characteristics of facilitators tend to directly influence the educational process and outcomes of IPE.²³ It is therefore essential to understand the important characteristics needed to facilitate IPE effectively.

Students need facilitation when they are expected to work within a group as teamwork is not an automatic process.⁶ Morey *et al.*³⁹ suggest that facilitators should mentor and guide students during interpersonal teamwork. Bridges *et al.*²⁹ and Treadwell and Havenga³⁰ support this statement. Role models who give guidance on how to function in a team is experienced as beneficial to students.²³

Academic staff often show resistance to participate in the development of an IPE curriculum due to a lack of confidence and knowledge or the necessary skills to facilitate IPE.^{6,23} Educational institutions should therefore be supportive to encourage

appropriate staff development activities for facilitators involved in IPE. “Becoming a skilled educator in interprofessional education is a process.”³⁰ Staff training should result in “competent and confident” facilitators of IPE.^{30,40} For staff members to facilitate IPE, regular reflections of their personal and professional IPE experience is needed²⁵ and continual staff development should be part of IPE programmes.²³ Even though it is clear that continual staff development should be part of IPE programmes,^{23,29,41} staff training for IPE are uncommon according to the WHO 2010 report.¹

Understanding the importance of facilitating IPE and being a role model for students were considered during the implementation of the IPE programme in this study. The researcher acted as the only facilitator of the IPE programme during this study.

2.3.2 P2: Process

The second “P” represents the Process of IPE. The process includes the facilitation of learning “through the planning and delivery of educational interventions”.²⁸ This section refers to the educational approaches and methods and the learning content of IPE which is the two aspects that encompass the second “P” of Process.²⁸ These two aspects are described in the sections to follow.

2.3.2.1 Educational approaches and methods

Two educational approaches are suggested for the implementation of IPE: Kolb’s Experiential Learning Theory and the Adult Learning Theory. Several other methods from paper-based cases to real-life patients could also be used for the facilitation of IPE.

Treadwell and Havenga³⁰ based their IPE on the Kolb’s Experiential Learning Theory, which includes a meaningful and relevant context, experiential learning, debriefing and reflection.⁴² As mentioned previously, the context of IPE should be authentic and relevant to reflect the reality of service delivery as closely as possible.²³

Experiential or interactive learning was seen as an important aspect for successful IPE implementation.^{43,44} Experiential learning in a work-based setting is suggested.⁴⁵ Experiential workshops with simulated patient scenarios were also found to be a valuable learning experience as these simulations create a safe environment.³⁷ Reflection should also form part of the learning process²⁹ as it is an in-depth evaluative process where knowledge and practical experience are integrated.⁴⁶ Mu *et al.*²⁵ conclude that “active learning and reflective methods are strongly advocated in IPE as these methods have shown to lead to better quality of care of patients and improved patient outcomes”. Hammick *et al.*²³ confirm this statement as they also identified reflection as a vital part of learning and suggest allocated time for reflection. Team reflection should therefore be included as a learning strategy in IPE.²⁹

The Adult Learning Theory is another educational approach used to facilitate teamwork.^{23,33,45} The WHO 2010 report confirms that IPE is more effective when the principles of adult learning are used.¹ The Adult Learning Theory “suggests that learning is more likely to become embedded if the learner has a degree of control over the pace and content of learning and the area under study is personally and professionally relevant”.²³ Critical reflection to “surface tacit knowledge and beliefs are also essential during adult learning”.⁴⁷

Teaching methods such as small groups, simulated and real case studies, videos, role play and problem-based learning are also commonly used during IPE.³³ Students prefer learning experiences to be structured.⁴⁸ D'Eon⁴⁴ suggests three stages of IPE. The first stage includes paper-based cases, the second stage includes simulations provided by volunteer patients and lastly, real-life patients.⁴⁴

Both Kolb's Experiential Learning Theory and the Adult Learning Theory could be used during the implementation of IPE. Whatever educational approach or methods are used, a structured learning environment should be the result.⁴⁸ In this study, experiential learning, the Adult Learning Theory and reflection were used. A description of the programme will be provided in chapter 3.

2.3.2.2 Learning content of interprofessional education

The learning content forms part of the Process as represented by the second “P” and is further subdivided in learning outcomes and assessments.

Learning outcomes

The learning content depends on the learning outcomes stipulated for each profession.³⁰

A literature review and synthesis about learning outcomes in IPE completed by Thistlethwaite and Moran⁴⁹ have identified six themes of learning outcomes based on the WHO report in 2010.¹ The themes comprise 1) teamwork; 2) roles and responsibilities; 3) communication; 4) learning/reflection; 5) patients/clients; 6) and ethics/attitudes. An IPE model should create an opportunity to experience, share and practice “responsibility, accountability, coordination, communication, cooperation, assertiveness, autonomy, mutual trust and respect”.²⁹ Cooper *et al.*³³ suggest that whatever the interprofessional outcomes are, these outcomes should primarily cause change in knowledge, skills and attitudes.³³ This was also suggested by Tashiro, Byrne, Kitchen, Vogel and Bianco.⁵⁰ The paragraphs that follow will describe what is meant by knowledge, skills and attitudes.

The learning outcomes related to knowledge are the understanding of the roles of other healthcare professionals.⁵⁰ Gaining knowledge about team members is an essential outcome of IPE.⁸ This includes knowledge about the role of each profession as well as the contribution that professionals could add to patient healthcare.⁵¹ Learning activities to understand the roles of the different team members, including the role of individual team members, should be created.^{29,52}

Skills such as communication should form part of IPE. Poor communication skills are identified as a major hindrance to teamwork. According to literature not a lot of time is currently allocated by most institutions of higher education to teach students about interpersonal skills.^{21,53}

Learning outcomes related to attitudes should include developing “mutual respect, a willingness to collaborate and an openness to trust”.⁵⁰ The learning environment should also consist of mutual respect and trust.⁴⁵ IPE should acknowledge differences, challenge stereotypes and prejudice, encourage contribution and facilitate a better understanding of one’s own profession and how an improved understanding of your own profession could contribute to improved patient outcomes.⁴⁵

In conclusion, the learning outcomes for IPE should focus on the knowledge, skills and attitudes needed by participants for the IPE to be successful. This study focused on teamwork, essential for IPE. The knowledge, skills and attitudes in teamwork were not specified as learning outcomes. Further studies may focus on the specifications for teamwork.

Assessment

Assessment of learning outcomes should be included in IPE.³⁰ If the learning outcomes for knowledge, skills and attitudes are set, the assessment should evaluate these outcomes.

In Cooper *et al.*’s³³ study, methods of assessments included essays, poster presentations, reflective diaries, community profiles, case presentations, reports, project assessments, objective structured clinical examinations (OSCE), written examinations and self-assessment exercises.³³ These assessment methods, according to the WHO 2010 report, can range from individual assignments to group situations.¹ Changes in attitude or behaviour could be measured by means of self-report questionnaires or an attitude scale.⁴⁹

No assessments were included in the IPE programme of this study, but will be considered in the future.

2.3.3 P3: Product

The third “P” in the 3P-model is Product which represents the outcomes of IPE. Healthcare and educational benefits are two products of IPE largely noted in literature.

Service delivery, as an ingredient of healthcare, should be a product of IPE.²⁹ Health-related outcomes include a more holistic view of the health needs of patients as well as improved communication with families.¹ Patients also reported improved healthcare satisfaction after receiving healthcare from a collaborative team of professionals.² Research has shown that collaborative practice decreases the length of hospital stay, lowers staff turnover, avoids healthcare services that overlap and decreases mortality rates.² Even though improved teamwork has the potential to improve patient care, this will not in itself provide optimal healthcare.⁴ Patients are however more likely to receive quality and safe healthcare when team members understand the different roles of team members and are able to communicate and collaborate effectively.⁵⁴ The impact of IPE on professional practice and patient outcomes is not yet fully understood due to the difficulty in generating related data.⁵⁵

Patient care as a result of IPE is seen as a very important outcome.³³ IPE outcomes should not be merely to work in a co-ordinated manner but should also be to communicate with different professionals and be able to apply knowledge related to teamwork with respect and a positive attitude.¹ Other outcomes explained by different studies include a better understanding of the roles of healthcare professionals, enhanced communication,^{4,25} improved collaborative practice, reduced negative stereotypes, improved attitudes towards teamwork and the acquisition of knowledge and skills.^{43,56,57} Other educational outcomes include being able to reflect critically about one’s own role within the team.¹ Hammick *et al.* found that 6 of the 21 studies in their literature review indicate behavioural changes after IPE. It should be noted that it was through self-reported perceptions that these behavioural changes were noted.²³ Educational outcomes should ultimately improve health outcomes.⁴

This study focused more on the educational benefits of IPE rather than on health-related outcomes. However, opportunities were provided to students in this study to

describe their expected outcomes of IPE, which may have included health-related outcomes.

Studies of interprofessional education in the South African context are limited. The two articles written by Waggie and Laattoe⁶ and Treadwell and Havenga³⁰ focused on the development and implementation of interprofessional education but the settings differ greatly. Up-to-date no study, conducted in a similar South African setting, was found that relates to the development of health-care students over a period of time. This gap in research led to this research study.

In conclusion, the 3P-model was used as a conceptual framework to implement an IPE with undergraduate final-year students at the University of Pretoria. There is however various challenges in creating such an IPE for a specific context, and these challenges will be discussed in the following sections.

2.4 CHALLENGES DURING THE DEVELOPMENT AND IMPLEMENTATION OF INTERPROFESSIONAL EDUCATION

Various challenges in IPE are described in literature. This section provides a summary of the challenges during the development and implementation phase of IPE.

The development of an IPE programme are challenging because many different disciplines are involved and a large amount of students groups usually participate in such a programme.²³ Students on different levels of clinical exposure, different levels of self-confidence in executing assessments or treatments, different attitudes in quality and safety of treatments and different expected learning outcomes are some of the challenges that can be experienced.^{21,58} A lack of resources, organisational barriers, problems in defining IPE, setting objectives for IPE, and negative attitudes towards IPE and other professionals could also be barriers.²⁴

A major challenge identified in Hammick *et al.*²³ and Tucker *et al.*'s⁵⁹ study was the complexity related to co-ordinating the different timetables of various disciplines.^{23,59} Morison *et al.*⁴¹ identified the co-ordinating the different timetables of various disciplines as the most significant barrier for the implementation of teamwork.⁴¹ The

administration behind an IPE programme is time consuming and complex.²³ The development of web-based programs should not be discarded when an IPE programme is implemented as these programs could administer course content, assignments and communication with students.^{4,29} Making attendance compulsory together with a flexible timetable can prevent organisational barriers in becoming a challenge.⁴

IPE aims to enhance collaboration among professions but ironically teamwork among staff was identified as one of the biggest challenges.¹¹ No amount of support from institutions, faculties and lecturers could contribute to staff being reluctant to collaborate and work within a team.⁶⁰

The most challenging barrier experienced by the researcher during the development and implementation of the IPE programme in this study was co-ordinating the timetables of the different disciplines. Other challenges mentioned above were not relevant to this study.

The researcher was able to co-ordinate through a time-consuming exercise a programme for final-year occupational therapy students, physiotherapy students and speech therapy students to provide healthcare in a relevant clinical setting as a team. The IPE programme that was developed and used will be discussed in chapter 3.

2.5 CONCLUSION

In this chapter, the researcher indicated the need for IPE to improve healthcare. The 3P-model was used to discuss literature related to IPE. The challenges of developing and implementing IPE were also mentioned. These challenges could not however create a big enough barrier that could not be overcome in this study. In chapter 3 the researcher will discuss the research design and methods used in this research study.

3 CHAPTER 3: RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

3.2 CONTEXT

3.3 RESEARCH DESIGN

3.4 METHODOLOGY

3.5 PILOT STUDY

3.6 REFLECTIVE JOURNAL

3.7 TRUSTWORTHINESS, VALIDITY AND RELIABILITY

3.8 CONSIDERATION OF ETHICS

3.9 CONCLUSION

3.1 INTRODUCTION

This chapter highlights some important aspects of the context and gives a description of the research design, methodology, pilot study, reflective journal, trustworthiness, validity and reliability and consideration of ethics for the study. The primary question of the study was: What is the influence of exposure to an interprofessional education (IPE) programme on the development of the final-year undergraduate healthcare students as interprofessional team members?

To answer the primary question, five objectives were identified by the researcher: 1) to determine the expectations of the healthcare students with regard to teamwork prior to the implementation of the IPE programme; 2) to determine the students' experiences after the implementation of the IPE programme; 3) to determine the experiences of the clinical supervisor as observed during the IPE programme implementation; 4) to determine the quality of teamwork before implementation of the IPE programme and 5) to determine the quality of teamwork after implementation of the IPE programme. Qualitative methods were best suited to achieve the first three

objectives whereas the last two objectives were measured with the use of quantitative methods. A multi-method approach which includes qualitative and quantitative elements was therefore the most suitable method for the study.

3.2 CONTEXT

The research design and methodology of the study could only be understood if the setting in which the study was done are clearly described. The background to the study was provided in chapter 1. It is however important to understand the academic context of how each discipline is embedded in different modules and the different outcomes that should be achieved with each module. The duration of fieldwork, the amount of students involved and the duration of exposure to the children at the centre also differs. See Table 3.1 for a summary of the programme of each discipline of healthcare students involved in the study.

Table 3.1: Programme details of healthcare students involved in teamwork at the setting

Discipline (final-year students)	Module	Clinical supervisor	Outcomes for the module related to teamwork	Duration of fieldwork practical	Number of students involved per fieldwork practical	Exposure to the children/setting	Assessment methods
Occupational therapy	Occupational Science (AKU 400 Community)	Only the researcher (clinical supervisor) was available during fieldwork.	Various outcomes of which one is interprofessional teamwork.	For 6 to 7 weeks from Monday to Friday (8 to 10 hours per week).	12 to 15	10 to 12 contact sessions for the duration of 6 to 7 weeks.	No summative or formative assessment specific to teamwork.
Physiotherapy	Physiotherapy in the Community (FTP 400 and POL 400)	Clinical supervisor not available on the site.	Various outcomes of which one is interprofessional teamwork.	For 4 weeks only on Wednesday mornings (3 hours per week).	2 to 3	4 contact sessions (08:00-11:00) for 4 weeks.	No summative or formative assessment specific to teamwork.
Speech therapy	Human Communication (KPM 483)	One clinical supervisor available during fieldwork.	Entire module includes teamwork in a community setting.	For 6 weeks only on Wednesday mornings (3 hours per week).	4 to 6	6 contact sessions (08:00-11:00) for 6 weeks.	A written report about teamwork is required (summative assessment).

Table 3.1 gives a summary of the programme detail of the disciplines involved in the study. It should be highlighted that the timetable of the different healthcare students are not co-ordinated with regard to the duration of the fieldwork-practical as well as exposure to the children/setting.

3.3 RESEARCH DESIGN

Defining the term ‘research design’ appears to be a rather “ambiguous” task as various different terms and definitions related to the research design are used for both qualitative and quantitative research in literature.⁶¹ Other terms to describe the research design in qualitative research are “strategies, methods, traditions of inquiry and approaches”. In quantitative research the words “method, plan or programme” are used.⁶¹ For the purpose of this study the term, study design, will be defined as the framework in which the researcher have various options available to study a phenomenon suitable for the specific research goal.^{61,62}

As previously mentioned, the multi-method research design was chosen as the most suitable design to answer the research questions. A multi-method research design is when both quantitative and qualitative data elements are used.⁶¹ This study design differs from mixed methods as a multi-method research design only includes qualitative and quantitative aspects during the methodology phase of a study and not qualitative and quantitative aspects during all phases of research as with mixed methods.⁶¹

A multi-method research design was employed because of three reasons. Firstly, literature explains that both qualitative and quantitative elements could add value to a research study. Cooper *et al.*³³ reviewed 30 articles to create a framework for evidence-based IPE programmes for undergraduate health students. According to Cooper *et al.*'s review, more articles of quantitative than qualitative nature were found during their review. The qualitative studies were however “found to produce better scores for their methodology” because it is a rich source of information that relates well to the “complex processes” of IPE.³³ Buckley⁶³ agrees with Cooper *et al.* as a quantitative approach alone is not always applicable to all the aspects that healthcare consist of.⁶³

Secondly, multi-methods were chosen to decrease the possibility of bias and to overcome some of the inherent limitations of these different methods and to combine the benefits of research methods.⁶² Qualitative as well as quantitative methods have been used to determine the same phenomenon of the study. The quantitative data

were however used to expand and effectively deepen the description of the qualitative data.

Thirdly, Greene, Caracelli and Graham⁶⁴ suggest five reasons for using a multi-method research design, namely for triangulation, complementarity, development, initiation and expansion.⁶⁴ Three of the suggested reasons proposed by Greene, Caracelli and Graham were used for this study. Triangulation was used to combine, support and crosscheck the results obtained.⁶⁴ Qualitative and quantitative methods have both been used to assess the same aspects of the phenomenon and therefore triangulation strengthens this study. To elaborate and enrich the phenomenon multi-methods have been used for the purpose of complementarity.⁶⁴ The different methods used are intended to clarify knowledge and provide a complementary understanding of the phenomena. Multi-methods have also been used with the intention to expand the understanding of the phenomenon. The qualitative aspect of the study aimed to give insight to what influence the IPE programme had on the development of the healthcare students. The quantitative aspect on the other hand assessed the quality of teamwork as experienced by the students thereby expanding the knowledge generated by the qualitative data.⁶⁴

A multi-method approach was chosen according to the recommendations made by authors in literature to overcome inherent limitations of either qualitative or quantitative research methods, to serve as triangulation, to complement the different research methods and to expand the knowledge generated about the phenomena.

3.4 METHODOLOGY

Methodology is defined as “the collection of methods or rules by which a particular piece of research is undertaken and the principles, theories and values that underpins a particular approach to research”.⁶⁵

This methodology section includes the research assumptions, phase one of the research process, the implemented IPE programme and phase two of the research process. The qualitative and the quantitative methods used are discussed separately under each phase. Figure 3.2 illustrates the layout of the methodology section.

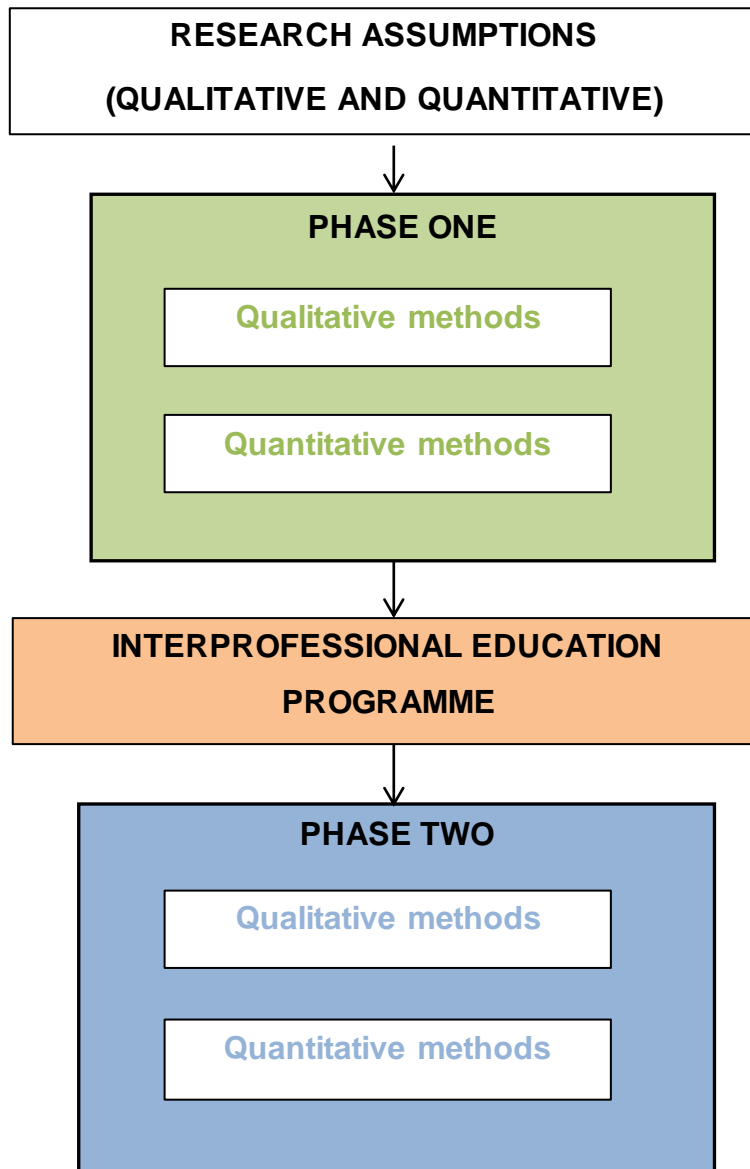


Figure 3.1 Layout of the methodology section of this chapter

To make sure the methodology section is easy to read, the three headings (phase one, the IPE programme and phase two) will appear in the same colour in this chapter as seen in Figure 3.1. Phase one will appear therefore in green, the IPE programme in orange and phase two in blue. The assumptions related to the qualitative and quantitative methods will be discussed first.

3.4.1 Assumptions

The philosophical assumptions of the study are discussed first to guide the reader to understand the qualitative assumptions made in relation to the phenomena The

quantitative assumptions related to the research instrument will be discussed thereafter.

3.4.1.1 Qualitative assumptions (philosophical)

A philosophical assumption can also be referred to as a paradigm and influences the way the researcher studies and interprets the phenomena. The term, paradigm, is defined as “a loose collection of logically related assumptions, concepts or propositions that orients thinking and research”.⁶⁶

It is essential to discuss the philosophical assumption clearly as it “sets down the intent, motivation and expectation for the research”.⁶⁵ The ontological, epistemological and methodological assumptions of the researcher are discussed:

Ontological assumptions

According to Mason⁶⁷, ontology could be described as the “nature or essence of the phenomena”. Teamwork, a phenomenon addressed in this study, is a complex and integrated process with various variables that have an influence on each other. Teamwork is more than just the different roles the team members play. The ontological assumption for this study was that teamwork and its effect could be understood by means of determining the experiences of the team members. It is assumed that all members involved during interprofessional teamwork would have had experiences, views and knowledge to share.

The researcher supported the ontological position of constructivism as the researcher had the intention of “understanding the world of human experiences” and relied on the “participants’ view of the situation being studied”.^{62,68} The constructivist paradigm aims to “generate or inductively develop a theory or pattern of meanings”.⁶⁸ The assumption was made by the researcher that the experiences of the team members involved would provide information to describe and understand the influences that the IPE programme had on the students’ development from individual discipline-specific healthcare students to interprofessional team members.

Epistemological assumptions

Epistemology is defined as the theory of knowledge or evidence that underlines the ontology.⁶⁷ Through the experiences of different team members involved in the IPE programme, the researcher assumed that she would be able to establish the effect of the programme on the members. The researcher also assumed that the social realities of teamwork are constructed in and through interaction. The team will then be established and changed through interaction and the team members will therefore be changed through exposure to the interactive IPE programme.⁶² The researcher assumed she would have been able to understand the social process and the influences that can lead to change by observing teamwork.⁶⁷

Epistemological questions argue whether interprofessional teamwork and the programme related to IPE could in any way be scientifically measured. For the purpose of the study the researcher assumed that the processes investigated within IPE would always have a social meaning and that only by using a scientific approach to a social process, the highly complex system would be limited. The assumption was that the students would have been able to express or communicate their understanding, ideas, views and experiences from individual discipline specific healthcare students to interprofessional team members in written format.⁶⁷

Methodological assumptions

Methodology is the method that is followed to measure the ontology to reach the epistemology of the intended research.⁶⁷ It was assumed that the students would have the ability to reflect and formalise the influences of the IPE programme on their own development as team members. It was also assumed that the students would have the capacity to communicate, remember, explain and verbalise their experiences and knowledge to such an extent that the researcher would have been able to understand the information.⁶⁷ Another assumption was that by observing the team processes and interaction with team members, the clinical supervisor would have obtained information about

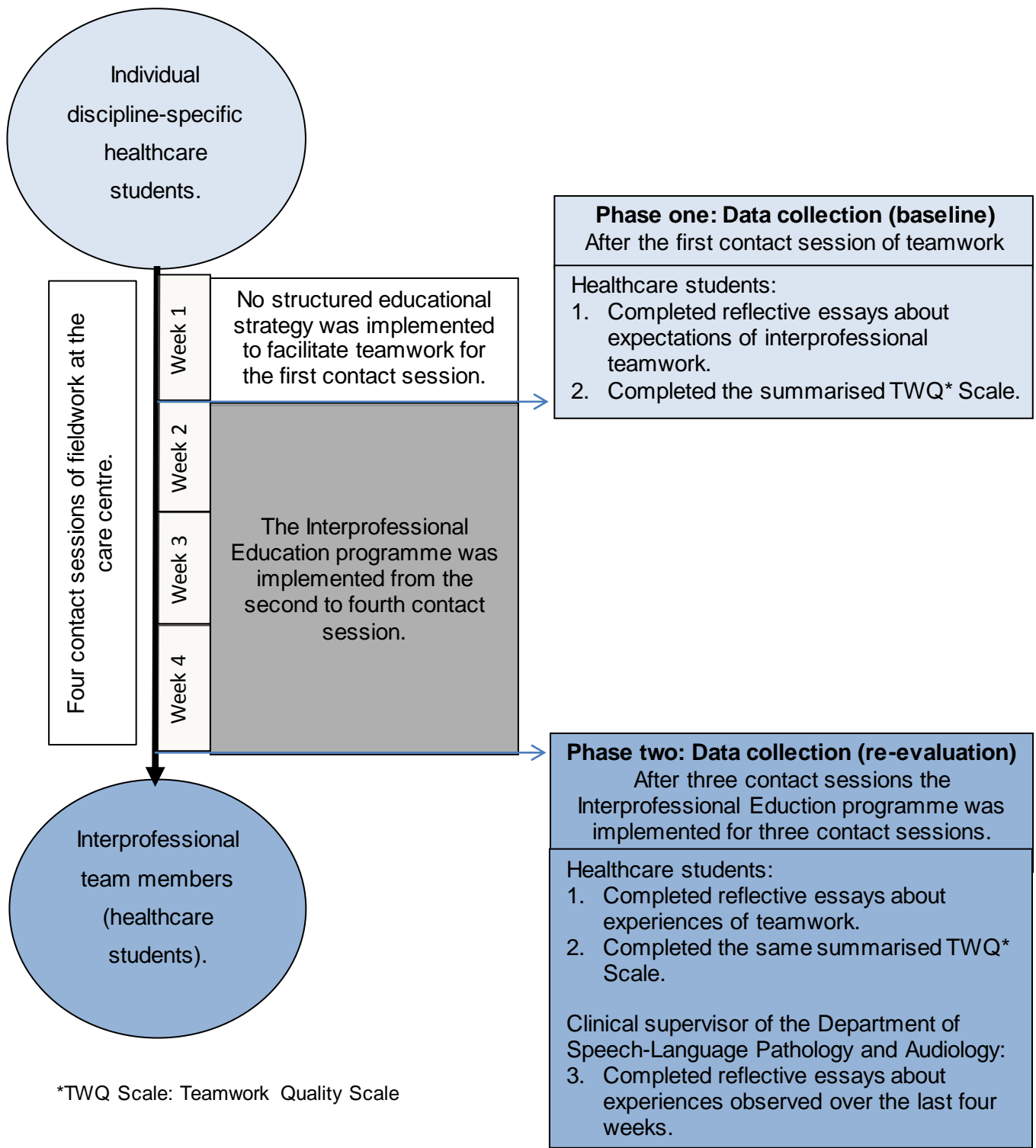
the development of the students. Observation would also fill some gaps created by the students' varied abilities to express their views.

3.4.1.2 Quantitative assumptions

The researcher assumed that a scale/survey instrument/questionnaire would have been effective in measuring the quality of teamwork as experienced by the students – before and after the implementation of the IPE programme. By comparing the same instrument before and after the implementation, the researcher would be able to compare the results and determine whether any changes occurred after the implementation of the IPE programme.

3.4.2 Overview of the methodology of the study

Figure 3.2 provides an overview of the study including the time frame and methods used to generate and collect data.



Additional:
The clinical supervisor/researcher of the Department of Occupational Therapy kept a reflective journal after each contact session. This journal was not used as a data source but to explicitly state her position in the study.

Figure 3.2: Overview of the methodology of the study

A baseline evaluation (phase one) and re-evaluation (phase two) were conducted. No structured IPE programme was implemented during the first interprofessional teamwork contact session. The only practical arrangement facilitated in the first contact session was that the students were divided into groups and a child (patient) was allocated to each group.

After the first contact session the students were invited to participate in the research study. Voluntary informed consent was obtained. For the baseline evaluation the final-year healthcare students completed a reflective essay on their expectations of teamwork at this setting. The students were also asked to complete a summarized and modified Teamwork Quality (TWQ) Scale. The summarized and modified TWQ scale is referred to as only the summarized TWQ scale in the rest of the document. The IPE programme was implemented for the next three consecutive contact sessions.

After the last session of interprofessional teamwork, a re-evaluation was conducted. The healthcare students were invited to complete another reflective essay where they were asked to reflect on their experiences of teamwork and the same summarised TWQ Scale was also completed. Voluntary informed consent was obtained. The clinical supervisor of the Department of Speech-Language Pathology and Audiology who was present for all of the four contact sessions was also invited to complete a reflective essay. The researcher (clinical supervisor) completed a reflective journal after each contact session. The first phase of data generation and collection, the IPE programme and the second phase of data collection are discussed in the sections to follow.

3.4.3 Phase one of the research process

The data collection of the study was divided in two phases. The purpose of the first phase was to establish the baseline and the second phase was used as a re-evaluation to determine the influence of the IPE programme on the development of the students as interprofessional team members. Table 3.2 provides a summary of the data sources and methods used during phase one of the research process. It should be noted that phase one commenced after the first contact session.

Table 3.2: Data collection sources and methods of phase one

	Data sources	Methods	Data collection/generation
No structured educational strategy was implemented for the first contact session.			
Phase one	Final-year occupational therapy, physiotherapy and speech therapy students.	Qualitative method	Reflective essays of the students' expectations of teamwork.
		Quantitative method	Summarised TWQ* Scale.
*TWQ: Teamwork Quality Scale			

The qualitative and quantitative methods used in phase one will be discussed separately in the next section.

3.4.3.1 Qualitative methods (phase one)

The section describes the sampling, data generation and organisation, data analysis and interpretation of the qualitative methods used during phase one (baseline evaluation).

Sampling

In qualitative studies the sampling “depends on what you want to know, the purpose of the inquiry, what is at stake, what will be useful, what will be credible and what can be done with the available time and resources”.⁶¹ The sampling size for qualitative studies is not determined before data collection but when data saturation has been reached after data collection. This sampling size was therefore not statistically determined as with purely quantitative studies.⁶¹ Generalisation is not always achievable but according to Denzin and Lincoln⁶⁹ any case will have some aspects or attribute of the universal.⁶⁹ “The reader should therefore, be able to generalize subjectively from the case being studied according to his own experiences.”⁶¹

Population sampling

The final-year healthcare students of the University of Pretoria were the identified population of the study. A total of 21 final-year healthcare students were invited to participate in the study. This number consisted of thirteen occupational therapy students, two physiotherapy students and six speech therapy students.

Sampling method

A purposive sampling (non-probability sampling) method was chosen.⁶² Purposive sampling is done in a strategic way by taking the aim of the study into consideration.⁶² The criteria for sampling identified by the researcher was that participants had to be final-year healthcare students who participated in all four contact sessions in the practical fieldwork at this particular setting. No age or gender was identified as criteria. This type of sampling is also called criteria purposive sampling.⁶²

Inclusion criteria

All the final-year healthcare students enrolled in the respective modules (see Table 3.1, p.28) at the University of Pretoria who were involved in the community fieldwork practical during the four contact sessions were included in the sample and invited to participate. Students who were absent for one of the contact sessions were excluded from the sample.

Sample size

The total sample size was 19 students who voluntarily participated in both the data generation phases. Two of the students were not present during all four contact sessions. The sample size therefore comprised twelve occupational therapy students, two physiotherapy- and five speech therapy students.

Data generation and organisation

The qualitative data generation method used for the first phase of the study was to complete a reflective essay. The participants were asked to complete

the essay after the first contact session of teamwork, prior to the implementation of the IPE programme. The reason why the data for phase one were generated after the first contact session, was to allow the students to familiarise themselves with the context where teamwork would take place. This essay comprised one open-ended question where the students had to reflect on their expectations of teamwork in this setting.

The researcher explained the information leaflet and procedure whereafter she left the setting. An independent occupational therapist with a Masters qualification in occupational therapy was responsible for handing the reflective essays to the students and collecting the essays from them after completion. The researcher was telephonically available for any questions or queries.

After consent was given the independent person allocated a number to each student's name as the same number was used during phase one and phase two of data collection. The independent person was responsible to co-ordinate the research numbers during phase one and phase two as the students had to write the same number they received on all the documents that had to be completed in phase two. The list with the student names allocated to the different numbers was kept safely by the independent person throughout data collection (phase one and phase two). This procedure was also described to the students to make it clear that the researcher would not be able to identify the students in their reflective essays.

The essays were clearly marked with the date of collection as well as the student research number. The independent person scanned and emailed the essays to the researcher. The researcher later scanned the data again to ensure that all the data were backed up.

Data analysis and interpretation

Blanche *et al.*⁷⁰ summarised qualitative data analysis as “reading through your data repeatedly, and engaging in activities of breaking the data down (thematizing and categorising) and building up again novel ways (elaborating and interpreting)”.⁷⁰ During the analysis of this study both interpretive data analysis and content analysis were used.

Interpretive data analysis

Interpretive data analysis is the “back and forth movement between the strange and the familiar, description and interpretation, foreground and background, part and whole in such a way that the people familiar with the context would recognise it as true but far enough away so that it would help them to see the phenomenon in a new perspective”.⁷⁰

Thematic analysis was the approach used by the researcher that guided her during interpretative data analysis. Thematic analysis is a bottom-up approach of “a method for identifying, analysing and reporting patterns (themes) within the data”.⁷¹ The purpose is therefore to generate themes and subthemes. During a bottom-up approach no existing themes have been identified before data analysis, the themes needed to emerge from the data.⁷⁰

Bryman^{62,72} describes a theme as a category identified by the researcher in the data collected and themes should be related to the focus of the research.⁶² The researcher was guided by Bryman’s steps in thematic analysis as discussed below:^{62,72}

- a. Familiarisation: After the collection of the data the researcher read through all the data to familiarise herself with the data. The researcher then wrote down the significant, interesting and important aspects that came to mind. The researcher refrained from interpreting the data as far as possible during this step.⁶²
- b. Marginal notes/coding: During this step the researcher made marginal notes of categories/themes that emerged as she read through the data for the second time. This is the step in which the coding of data occurred. The marginal notes contained keywords or phrases used by the participants or a summary of the phrases or words identified by the researcher. The researcher kept the research question in mind when identifying codes. The researcher had to be patient during the second step as the “codes appeared descriptive, repetitive, overwhelming, unrelated and ambiguous”.⁶²

- c. Themes and subthemes emerged: As all the data collected were transferred to a Microsoft Office Word 2010 document, the phrases/words were copied and pasted into a Microsoft Office Excel 2010 document next to the specific code identified. Related codes with the relevant phrases/quotes were also copied to this Microsoft Office Excel document. This made it easy to have all the related categories together and to decide on themes and subthemes relevant to the data.⁶² The cut and sort manual processing techniques was used as this is the most versatile technique to generate themes.⁷³ The different categories/codes were printed and placed on an open table to make sure that the best possible themes for the study were chosen.
- d. Elaboration: Themes were then critically evaluated and revised to determine if the codes had significant connection or association with other codes generated or if possible over analysing could have occurred.⁷⁰ The analysis of data is not a linear process but on-going as the researcher had to continue to generate codes, elaborate on previous codes and record as new codes often emerge during this step.^{62,71} The step of elaboration was essential for thorough analysis to take place.⁷⁰ Critical evaluation was continued until no new significant themes emerged. Literature was examined and assisted the researcher to make sure the codes and themes were relevant to the phenomena being studied.
- e. Interpretation: A theoretical understanding of the data was constructed during this step. The researcher had to discuss and interpret the themes and subthemes that emerged while keeping the research question in mind.⁷⁰ It also involved reading and re-reading and moving back and forth between data. It was a process of unpacking the data, reflecting on the data as well as submerging oneself in the data.⁷⁰

Content data analysis

It is suggested that researchers should use various ways to analyse data as only one technique could lead researchers to find what they are looking for in the data.⁷³ Content analysis was therefore used. Content analysis “focuses on

the characteristics of language as communication with attention to the content or contextual meaning of the text”.⁷⁴

Both the qualitative and quantitative components of content analysis were used during the data analysis phase.⁷⁴ Analysis with the only intention of counting the number of times a certain word or phrase has been used, would be seen as a quantitative way of analysing the data.⁷⁴

Qualitative content analysis goes beyond quantifying but focuses on interpreting or discovering the underlying meaning of the words/phrases.⁷⁴ The researcher used the following strategies and techniques for her analysis:

- When the text was analysed the researcher took note of the different paragraphs as different paragraphs often indicate a new concept.⁷³
- The connectors in a sentence were also noted as connectors often indicate a relationship between different ideas. Words such as because, as a result, since, if, then, instead, often, before, after, then etc. could be seen as connectors.⁷³
- Ryan and Weisner⁷⁵ suggest that the repetition of words or phrases is one of the first ways to identify themes.⁷³ If words are repeated in the text it could be seen as “salient in the minds of respondents” as people “frequently circle through the same network of ideas”.⁷⁵

The raw data, collected from the participants, were analysed by the researcher. The raw data were also sent to an independent reviewer to determine whether the reviewer agreed with the analysed data and themes generated. The reviewer has a Masters degree in occupational therapy and is familiar with the setting. The reviewer made some suggestions to merge two themes and highlighted two subthemes that were missed by the researcher. The researcher and reviewer had a discussion about the themes after the changes were made and the reviewer was satisfied with the changes made by the researcher.

3.4.3.2 Quantitative methods (phase one)

This section describes the sampling, data collection and organisation, data analysis and interpretation of the quantitative methods of phase one.

Sampling

Sampling in a quantitative study should be the “total sets of objectives, events or persons which together compromise the subject of study”.⁶¹ The considered representative size is directly related to generalisability.⁶¹ Incorporating all variations of the population in the representative sample is crucial.⁶¹ To understand sampling in a purely quantitative study is essential as the sample needs to be the exact representation of the subject of study for the results of the study to be generalised.

Despite the descriptions of what the different characteristics of the different sampling methods should consist of, the availability of resources – specifically students – had the biggest impact on the sampling size. The same population sample as mentioned in the qualitative methods (phase one) in Section.4.3.1 were invited to complete the scale during phase one. The same sampling method and inclusion criteria were followed. The actual sample size was however different as one student who gave consent did not complete the questions on the back of the scale document. A total of 18 participants were therefore the total sample size. The sample size consisted of eleven occupational therapy students, two physiotherapy students and five speech therapy students.

Data collection and organisation

The quantitative method used to collect data during phase one was a summarised TWQ Scale.

The TWQ, developed by Hoegl and Gemuenden in 2001, is a survey instrument used to measure the quality of collaboration in teams. This scale initially consisted of six categories namely communication, co-ordination, balance in member contribution, mutual support, effort and cohesion. The scale with these six categories consisted of 37 items and are discussed in the

article “Teamwork quality and the success of innovative projects: A theoretical concept with empirical evidence”.⁷⁶ The findings of the study indicated that the TWQ Scale is positively related to team performance (effectiveness and efficiency) and personal success of a team member (satisfaction and learning).⁷⁶ The study concluded that the scale now consists of ten categories, with effectiveness, efficiency, satisfaction and learning added as the additional four components to measure the quality of teamwork.⁷⁶ The new scale therefore consists of 60 items which is answered with a 5-point Likert scale from ‘completely agree’ to ‘completely disagree’.

The items on the scale that were not relevant to the setting were omitted therefore reducing the scale to only 50 items. Some of the wording of the scale has also been changed to make the items more relevant for this particular setting. Both of these changes resulted in the summarised version of the TWQ Scale. The reliability and validity of the scale are discussed after the pilot study in this chapter.

The summarised TWQ Scale was completed individually by each participant. The same research number that was used on the reflective essays was used on the summarised TWQ Scale. The purpose of the scale was to determine the quality of teamwork as experienced by each participant to establish the base-line evaluation. The same method of data collection by an independent person was followed as mentioned previously with the reflective essays. The essays were completed before the participants received the summarised TWQ Scale as the researcher did not want the participants to use the words they read in the scale in their reflective essay. The scales were clearly marked with the date of collection as well as the research numbers of the students. The independent person also scanned and emailed the scales to the researcher. The researcher made backups on her computer.

The questions of the summarised TWQ Scale were presented in the form of a 5-point Likert scale with sections ‘completely agree’, ‘mostly agree’, ‘unsure’, ‘mostly disagree’ and ‘completely disagree’. Each of the five possible answers was allocated a specific number in order to obtain a total for the specific category, e.g. ‘completely agree’ was allocated five points and the section

'disagree' was allocated one point. The data of the scale were captured by the researcher on a Microsoft Office Excel spread sheet. Four of the 50 items are asked in the negative form (as this is how the original TWQ Scale are) and the allocation of marks was therefore reversed for the four items, e.g. 'completely agree' was allocated one point and the section "disagree" was allocated five points for the four items that were asked in the negative. An independent person assisted the researcher to capture the data on the Microsoft Office Excel 2010 spread sheet to ensure that no mistakes were made in capturing the data. The Excel sheets were discussed with the statistician.

Data analysis and interpretation

The analysis of the summarised TWQ Scale was done with the use of the Statistical Package for Social Sciences (SPSS) for Windows, Version 23.0 Chicago: SPSS Inc. The data on the scale were entered into Microsoft Office Excel separating the first and the second phase. Thereafter the data was transferred to the SPSS program for analysis. The related-samples Wilcoxon signed rank test on the SPSS program for nonparametric results was used to compare the two sets of data (phase one and phase two). The data collected in the form of the ten categories of the summarised TWQ Scale in phase one were compared with the same ten categories in phase two. The statistician discussed the results with the researcher and assisted the researcher with the interpretation of the data.

The implementation of the IPE programme is described next.

3.4.4 The implemented interprofessional education programme

A broad overview of the literature related to IPE was already discussed in chapter 2. The following section focuses on the development of the IPE programme and implemented by the researcher. A short description of the development of the IPE programme is discussed first.

3.4.4.1 A description of the interprofessional education programme

The researcher is a junior lecturer/clinical supervisor at the Department of Occupational Therapy at the University of Pretoria. Similarly to all the other departments, the Department of Occupational Therapy strives to provide the best educational opportunities for its students. An interprofessional teamwork opportunity presented itself in 2012. Final-year occupational therapy students, physiotherapy students, speech therapy students and audiology students from the University of Pretoria were expected to follow a teamwork approach during their fieldwork practical at a care centre in a community to the east of Pretoria. The different healthcare students were expected to work together for optimal patient care, but not sufficient structure was provided to the students. The need to develop an IPE programme was identified by the researcher and extensive research was done to develop this programme specific to the context. The IPE programme was only finalised at the beginning of 2015 when the research was conducted. Table 3.3 provides an overview of the interprofessional programme developed for the specific setting.

Table 3.3: interprofessional education programme

Steps	Summary of the steps followed in the Interprofesssional Education programme
1.	Orientation: Revise the interprofessional teamwork process and divide the students into teams. Allocate clients to each student group.
2.	Team building activity: Get acquainted with the team members.
3.	Team meeting before the session: Face-to-face meeting to determine the objectives, session targets and role identification.
4.	Interprofessional teamwork: Assessments or treatment interventions to be conducted.
5.	Team meetings after sessions: Face-to-face meeting to evaluate the session conducted in step 4.
6.	Team reflections: All the teams meet for team reflections.

The interprofessional programme comprises six steps as indicated in Table 3.3. Each step is separately described below with reference to a summary of the literature used to develop the programme:

Step 1: Orientation

Cook *et al.*⁴⁸ describe stability as an important aspect to promote teamwork.⁷⁷ Stability was established by means of setting well-defined outcomes and providing clear steps for teamwork. The well-defined steps in this programme created a structured environment for learning.

Orientation was the first step in the interprofessional team process. The students were welcomed and the process, expectations and organisational aspects of interprofessional teamwork were discussed. The students were reminded of what the purpose and the process of the teamwork would be. The time available for IPE was also mentioned. The students of the respective disciplines were divided into teams. Stability and a consistent environment for a team is essential for teamwork.⁷⁸ The teams therefore stayed the same for the duration of all the interprofessional teamwork sessions to create a consistent environment. All the elements in step one aimed to create a structured and consistent environment for learning.

Step 2: Team building activity

The importance of a team building activity to enhance teamwork should not be underestimated. See annexure for team building activities used. The purpose of the team building activity was to get acquainted with the team members in the various teams.²⁹ Another reason for this step was to build cohesion, create structure and encourage interaction within the groups.⁷⁹ A team building activity has the possibility to decrease anxiety, increase interaction and enhance collaboration.^{39,80}

Step 3: Team meeting before the session

Various literature articles highlight the importance of regular face-to-face team meetings.^{27,53} Regular team meetings present opportunities for interaction. Communication has a direct effect on effective teamwork.²⁷

Team facilitators were identified by the members of each team. The student-facilitators were responsible to guide the team process and complete the necessary forms. A lack of leadership has the potential to create possibilities for poor decision-making and consequently poor teamwork.⁸¹ Even though literature suggests that a leader should be identified for effective teamwork, this step is often neglected.⁸²

The team members from each team received a client form which was completed, for each child, before the session started. A plan of action and the different roles and responsibilities of the team members in each team were noted on the client form. The client's diagnosis (or clinical presentation if no diagnosis was available) and objectives/session targets for the client were noted and discussed within each team. For each child step three to step five of the interprofessional education programme had to be followed. A new client form was therefore completed for each child.

Step 4: Interprofessional teamwork

During the fourth step the planned intervention sessions with clients were conducted. In each team different team members executed their responsibilities as discussed and noted on their specific client form.

Step 5: Team meeting after the session

After each intervention session had been executed, the team members of each team discussed the evaluation of their session. Evaluation of the treatment session as well as planning for the next treatment session was noted on the client form. The team facilitators handed the completed client

forms to the clinical supervisor/researcher. The client forms did not form part of data collection.

Step 6: Team reflection

Several authors suggest that reflection should be included in an IPE programme. Hammick *et al.*²³ identified reflection as a vital part of learning and suggest allocated time for reflection. Mu *et al.*²⁵ confirm this statement.

Fifteen to twenty minutes were set aside to verbally reflect after each teamwork session. All the teams came together in one group. Verbal reflection was facilitated by the researcher. The researcher made notes in her reflective journal after these discussions. The reflection sessions included what the students learned during that specific session about other professions as well as their own profession.

3.4.5 Phase two of the research process

The purpose of the second phase was to evaluate the influence of the IPE programme on the development of the students as interprofessional team members. Table 3.4 provides a summary of the data sources and methods used during the second phase of the study.

Table 3.4: Data collection sources and research methods used in the second phase

	Data sources	Research methods	Data collection/generation methods
Phase one – No structured educational strategy was implemented for the first contact session.			
The interprofessional education programme was implemented for the following three contact sessions.			
Phase two	Final-year occupational therapy, physiotherapy and speech therapy students.	Qualitative method	Reflective essays on the experiences of the students with regard to teamwork.
		Quantitative method	Summarised TWQ* Scale.
	Clinical supervisor of the Department of Speech Language Pathology and Audiology.	Qualitative method	Reflective essay with regard to the experiences of the supervisor.
*TWQ: Teamwork Quality Scale			

The qualitative and quantitative research methods for phase two are discussed separately.

3.4.5.1 Qualitative methods (phase two)

This section describes the sampling, data generation and organisation and the data analysis and interpretation of the qualitative methods used in phase two.

Sampling

Population sampling and sampling size

The two different populations (students and clinical supervisor) are discussed:

Population A: Healthcare students

The exact same population sample and sampling size was used as described in phase one.

Population B: Clinical supervisor

Except for the researcher, only one clinical supervisor from the Department of Speech-Language Pathology and Audiology was present during the four contact sessions. The clinical supervisor was not involved in the development or facilitation of the IPE programme but gave consent to participate in the study. The population consisted of only one.

Sampling method

The sampling method used in phase two was the same method described in phase one.

As the clinical supervisor was supervising the final-year healthcare students at the specific centre, convenient sampling was chosen. Convenient sampling is used in social research when data are easily “available to the researcher by virtue of its accessibility”.⁶²

Data generation and organisation

The qualitative methods used during phase two comprised a reflective essay completed by each of the healthcare students and a reflective essay completed by the clinical supervisor.

Reflective essay completed by the healthcare students

The students had to complete a second reflective essay in phase two after the fourth contact session. The IPE programme was implemented for the second, third and fourth contact session. The second reflective essay comprised of

three open-ended questions where the students had to reflect on their experiences of teamwork during the three contact sessions where the IPE programme was implemented. The same data organisation method was used during the second phase as the independent person also assisted during the second phase.

Reflective essay completed by the clinical supervisor

The clinical supervisor of the Department of Speech-Language Pathology and Audiology at the University of Pretoria also voluntarily completed a reflective essay. Three open-ended questions were asked that allowed her to reflect on the students' interprofessional teamwork from a clinical supervisors' point of view. The clinical supervisor completed the questions and emailed the essay to the researcher. The reflective essay completed by the clinical supervisor of the Department of Speech-Language Pathology and Audiology was not used for primary data generation.

Data analysis and interpretation

The qualitative data were analysed in the same manner as described during phase one. The data were interpreted with reference to the objective: to determine the influence of exposure to the IPE programme on the development of the final-year healthcare students as teamwork members. The expectations of students, as noted in the reflective essays completed during the first phase and the students' experiences in the second phase, guided the researcher to identify how the healthcare students developed from individual discipline-specific healthcare students to interprofessional team members.

3.4.5.2 Quantitative methods (phase two)

The same summarised TWQ Scale was completed after the implementation of the IPE programme. The sampling, data collection and organisation, data analysis and

interpretation as mentioned in phase one were therefore the same. The same method of data collection was followed by an independent person.

3.5 PILOT STUDY

A pilot study is “a small study conducted prior to a larger piece of research to determine whether the methodology, sampling, instruments and analysis are adequate and appropriate”⁸³ or as De Vos *et al.*⁶¹ describe a pilot study: “Like a dress rehearsal of the main investigation.”

The importance of a pilot study should not be underestimated – not only for quantitative studies but also for qualitative studies.⁶¹ Pilot studies in qualitative studies are usually more informal.⁶¹ The qualitative methods and quantitative methods used in the study formed part of the pilot study that was conducted before the interprofessional teamwork contact sessions commenced.

The purpose of the qualitative pilot study was to ensure that the reflective essays would generate the data these essays were intended to generate. The purpose of the quantitative pilot study was to ensure that the data collected and analysed would answer the secondary research question and to make sure that the questions asked in the summarised TWQ Scale would be understood by the population sample. The qualitative pilot study are discussed first.

3.5.1 Qualitative methods

A different reflective essay was used as the qualitative method for data generation in phase one and phase two and will therefore be discussed separately.

Phase one

The question in the reflective essay was discussed with the supervisor and co-supervisor of the study. Thereafter a colleague at the University of Pretoria with a doctoral degree was asked to also make some suggestions or changes. No changes were made to the question in the reflective essay used in phase one as it was decided that the question was clear.

Phase two

The three questions in the reflective essay completed by the students were discussed with the supervisor, co-supervisor and the same colleague asked to revise the question in phase one. Changes to some of the words in the reflective essay for phase two were made to ensure that relevant data were generated by the questions used. The following changes were made to the questions in the reflective essay used in phase two:

- The first question “Reflect on your experiences as a multidisciplinary team member in this particular setting” was changed to “Reflect on your **experiences** as a team member in this particular setting and write your reflections down below”. The word “multidisciplinary” was removed to prevent any confusion as the word “transdisciplinary” is used by speech therapy students when they refer to teamwork. The phrase “and write your reflections down below” was added to make sure the instructions or expected action was clear. The word “experiences” was emphasised in bold in the question.
- The second question was changed from “Reflect on your development from an individual discipline-specific healthcare student to a multidisciplinary team member after exposure to the multiprofessional education programme” to “Reflect on your **development (academic, social, emotional, personal) over the last few Wednesdays** from being exposed to mainly working individually (or with your own discipline) to working in a team with other disciplines. Please write your answer down below.” The independent person made it clear to the students that the last few Wednesdays referred to the last three contact sessions. The words “development (academic, social, emotional, personal) over the last few Wednesdays” were emphasised in bold in the question.
- No changes were made to the third question in the essay used in phase two.

3.5.2 Quantitative methods

The quantitative method used in phase one and phase two of the study was the summarised TWQ Scale. Testing the summarised TWQ Scale of the study was an

essential step in the research process. It was suggested that participants similar to the target group should be used prior to the main investigation.⁶¹

A pilot study was conducted with 15 third-year occupational therapy students of the University of Pretoria. The students were expected to work within a team in the same community for six contact sessions. The researcher invited the students to participate in the study and the informed consent form was discussed. The same procedure for informed consent was used as described later in this chapter. Voluntary consent was given by all 15 students and they completed the summarised TWQ Scale. The students were also encouraged to ask questions as the researcher was present during the completion of the scale. All the data of the scales received from the students were entered into the Microsoft Office Excel spread sheet developed by the researcher. The researcher arranged a meeting with the statistician to discuss the data as organised on the Office Excel spread sheet. Several changes were made by the statistician. It was suggested that the different columns of “completely agree” to “completely disagree” should represent a number from one to five as already described during the quantitative data analysis. The answer to each question of the scale was therefore represented by a number. This was to simplify the statistical process and interpretation of the data.

An occupational therapist who is currently completing her community work was also contacted per email. In 2014 she was a final-year occupational therapy student and was therefore exposed to teamwork in the exact setting where the study was conducted. She was invited to participate voluntarily in the study as part of the researcher’s pilot study to determine if the items as stated in the summarised TWQ Scale were clear and understandable. The same procedure to obtain informed consent was also used with her. From a student’s perspective, she emailed valuable comments with regard to her experiences. She also brought it to the researcher’s attention that not all the occupational therapy students had the opportunity to participate in teamwork as the ratio of occupational therapy students to speech therapy students and physiotherapy students were not equal.

3.6 REFLECTIVE JOURNAL

Observational notes in the form of a reflective journal were made by the researcher for the duration of the four contact sessions. The purpose of the reflective journal was to explicitly state the position of the researcher and was therefore not used as primary data. The researcher was guided by literature to direct the manner, timing and content of the notes.

Ortlipp⁸⁴ suggests to use reflective journals with the intent to create transparency in the research process. The researcher aimed to consciously acknowledge and write down the values and assumptions that have become part of the research process.⁸⁴ Ortlipp⁸⁴ suggests further that it is not always possible to claim that the research is true because certain strategies have been put in place to decrease bias but it is important that the process of data collection and data analysis should be as transparent as possible.⁸⁴ Bias or researcher influence continues to be a real concern in qualitative research. Ortlipp⁸⁴ states that instead of trying to control bias, the use of reflective journals will create a way of making beliefs and ideas known to the reader. A reflective journal was therefore used by the researcher to critically reflect during the research process.

The research process is not a “seamless, neat and linear process” but the use of a reflective journal made the researcher aware of possible “muddle, confusion, mistakes, obstacles and errors” and created an opportunity for changes to be made or different approaches to be used.⁸⁴ This approach suggested by Ortlipp⁸⁴ was used as the researcher made continual notes during the research process.

Mays and Pope⁸⁵ suggest that other benefits of researchers writing down their observations could be that researchers have a bigger understanding of the dynamic processes and often include aspects that they did not consider before the research was conducted.⁸⁵ Observations usually give researchers also a greater understanding about the context that could possibly have a positive effect on the research. Participants are also often unaware of their own behaviour and are not able to reflect on it.⁸⁵

De Vos *et al.*⁶¹ suggest that a reflective journal containing the observations of a researcher should include observations as well as interpretations, but they should be

separated.⁶¹ Morse and Field⁸⁶ state that there are important aspects to remember when field notes are made. “These include getting right to the task; not talking about the recordings before recording them; finding a quiet place to write; setting aside adequate time to complete the notes; sequencing notes in the order they occurred; and letting the events and conversation flow from the mind onto the paper.”⁸⁶ Bryman⁶² together with Mulhall⁸⁷ suggest that reflective notes should be jotted down during or directly after a social situation has been observed.^{62,87} During her first effort to write down notes, the researcher focused on only jotting down descriptive notes of what she observed. Interpretation was kept for the data analysis phase as far as possible. The observational notes were made within two to three days after a teamwork session took place. It was not possible to make the notes immediately after a teamwork session due to time constraints.

Some controversy has also been identified during the action of observation. One such aspect is that observers usually focus on what they would like to see and therefore their perspectives are guided. It is also difficult for observers not to interpret the data while they observe. It could also be possible that researchers as observers are not always able to see the aspects that are different from the usual if they have been part of the research for an extended period. The researcher of this study is of the opinion that no matter how sincere she tries to be objective during her research, it was impossible not to focus on the aspects that she would like to have focused on. The researcher also made personal reflective notes during the process to clearly state her own perspectives and assumptions as far as possible.⁸⁴

Another controversial aspect is the possibility of research participants changing their views if the researcher is involved in various aspects of the process or the presence of the researcher could influence the behaviour of the participants if they realise they are being observed.⁸⁷ It was therefore essential for the researcher to acknowledge these possible issues. It should be emphasised that the reflective journal was not used as primary data. The researcher believes that because she was facilitating the IPE programme over a period of time the students had the opportunity to become comfortable with her presence and also feel supported in teamwork. No formative and summative marks were given to the students by the researcher as this could have made the students feel that they need to change their behaviour.

A date was always provided with the comprehensive observations the researcher made in her reflective journal.⁶⁷ No names of students or children appeared in the journal. Separate notes were used to allocate a specific code to each name because the actual names of the students involved in her research could influence research analysis. The researcher's reflective journal therefore contains no names.

3.7 TRUSTWORTHINESS, VALIDITY AND RELIABILITY

The trustworthiness of the qualitative data as well as the validity and reliability of the quantitative data are discussed in the following section.

3.7.1 Trustworthiness

Data were collected from more than one source to ensure triangulation of data.⁶¹ Triangulation refers to “the designed use of multiple methods, with offsetting or counteracting biases, in investigations of the same phenomenon in order to strengthen the validity of inquiry results”.⁶⁴ The purpose of triangulation is therefore to decrease the possibility of bias and overcome the inherent limitation of the planned research method. Triangulation is intended to increase the trustworthiness of the results if used in the correct way.⁶⁴

Methodology and data triangulation are two of the four types of triangulation described by Denzil⁶⁹ that were used during the study. Methodological triangulation was obtained by including both qualitative and quantitative methods in a multi-method study. Data triangulation was achieved as more than one method or source of data was used. The methods included reflective essays and a scale while the sources were healthcare students and a clinical supervisor.

The researcher agrees with Ortlipp⁸⁴ who states that despite several strategies that are followed by researchers to increase trustworthiness, researchers should consciously acknowledge and be transparent about all the steps followed in the research process. It is therefore essential to critically reflect throughout the research process.⁸⁴

Four constructs need to be considered with regard to trustworthiness. These constructs include credibility, transferability, dependability and conformability.⁶¹ Credibility, according to Merriam⁸⁸, is “how congruent the findings are with that of reality”. Transferability of a study is concerned with the generalisation of the findings to other settings.⁶¹ The dependability of a study is difficult to achieve in a social world as the world is ever-changing. Dependability is closely related to credibility and if researchers employ methods to ensure the credibility of a study, it could also lead to an increase in the dependability of the study.⁶¹ Conformability is also a difficult construct to achieve as the intrusion of the biases of researchers are almost inevitable.

Bias could be limited as far as possible with the aid of research tactics.⁵ The research tactics or strategies that were used during this study are discussed below:

- The researcher aimed to clearly describe how the data collection, data analysis and data interpretation took place.⁵
- The use of triangulation could support credibility as different methods could compensate for the limitations of individual methods.⁶⁴ Triangulation of a study promotes conformability.⁵ Both methodological triangulation and data triangulation are achieved in this study.^{5,64} Greene, Caracelli and Graham state that bias could however continue to surface when triangulation is used because different methods could still generate data for the specific intentions of researchers. The other possibility for bias could be that different methods generate data unrelated to the aim and could therefore not be linked in any way to each other, not be supported or contradicted.⁶⁴ These possibilities were limited as far as possible as the researcher constantly reminded herself of her research aim and also asked an independent person to make suggestions related to the questions asked in the reflective essays.
- The researcher ensured honesty by allowing the participants to give informed consent for the study.⁵ An informed leaflet was discussed with all the possible participants of the study in order for them to make an informed decision whether they would like to participate. No formative or summative marks were given by the researcher for teamwork during the contact sessions. The absence of marks could prevent the participants from feeling that they had to answer according to

what they think the researcher would like to hear. Pretences were further prevented by making it clear to the students that the researcher would only have access to the research numbers and not the names of the students.

- Frequent discussions with the supervisor, co-supervisor and independent reviewer also guided the researcher to identify any possible bias or preference.⁵
- Numerous articles regarding teamwork and related concepts have been read and used during all phases of the research. The use of literature especially during the interpretation phase was essential to ensure credibility.⁵
- The limitation of making use of purposive sampling is that it is a non-probability sample and could seldom be a representative sample of a particular population. Social research is however frequently based on non-probability samples due to the difficulty and cost involved with probability sampling. With purposive sampling generalisation is also not possible.⁶² The context of the study has however been clearly described and allows readers or developers of IPE to identify if their context is similar to this study and could therefore have the potential to be generalised to a similar setting.⁵ Because the IPE programme has been clearly described, investigators from other settings could decide whether parts or the entire IPE programme would be applicable to their context.⁶¹ Gomm, Hammersley and Foster⁸⁹ however highlight the fact that this approach of transferring findings should be done with caution as the richness and uniqueness of qualitative data lie in the phenomena within the specific context that is studied.
- The possibility of the participants deciphering cues from the summarised TWQ Scale was excluded by asking them to complete their reflective essay before the quality teamwork scale was given to them for completion. This method was to eliminate the possibility of guiding the participants to what the researcher would like them to say or to use the words they have read on the summarised TWQ Scale.⁷⁴
- The researcher refrained from interpreting the data when reading through the data for the first time as this could have guided the researcher into a direction that is either known to the researcher or what the researcher expected the data to reveal.⁷²

- During the initial stages it appeared as if many of the codes were “unrelated” but the researcher refrained from only listing the codes that she thought will be useful. All the codes were typed into the Microsoft Office Excel spread sheet.⁷²
- The collected data were read and left for a period of time. The data were later reread as the same data were coded in several ways. Different versions of a Microsoft Office Excel spread sheet were used so as not to guide the researcher to see the previous code she allocated to a specific phrase or sentence. All the possible interpretations were coded and typed into the Microsoft Office Excel spread sheet even if some of the codes appeared unrelated. Some codes were therefore allocated to several categories.⁷²
- The possibility of over interpreting the data could not be excluded from the study.⁷⁰ Member checking was not possible to use as a strategy to avoid over interpreting data generated by the students as the names of the students names were not known to the researcher.⁷⁴ The independent reviewer was asked to review the themes of the study. The reviewer made valuable suggestions.
- A reflective journal containing personal reflective notes and observational notes was kept to explicitly state the researcher’s own role in collecting data and interpreting the data.^{62,70}
- During the steps of analysing and interpreting the data, the researcher was honest, open-minded and clearly stated her involvement in analysing the data.⁷⁰
- It was essential that the researcher explicitly explained her own predisposition in the research study.⁵ Findings were critically evaluated by the researcher. The findings of the research study as well as limitations are explained in chapter 6.

As can be seen from the abovementioned, the researcher employed various tactics to prevent bias while analysing or interpreting the qualitative data.

3.7.2 Validity and reliability

In 2011 the study “Measuring teamwork in healthcare settings: A review of survey instruments” was conducted by Valentine, Nembhard and Edmondson. The findings indicate that the TWQ Scale was one of three scales that satisfied both the standard psychometric criteria and was significantly associated with self-reported outcomes.⁹⁰

In the Valentine, Nembhard and Edmonds⁹⁰ on study the scale was identified as one of the best instruments to measure teamwork in healthcare settings. The TWQ scale was therefore valid to use for this study.

The authors Hoegl and Gemuenden describe the TWQ Scale as a fully standardised questionnaire with a Cronbach's alpha coefficient between 0.72 and 0.97 which indicates strong internal reliability.⁹⁰ The researcher summarised the TWQ Scale from 60 items to 50 items. All ten categories of the scale were still included as previously described. The researcher could therefore not claim that the summarised TWQ was "standardised" but because the scale was completed and compared by the same population the scales results of both phases were therefore compared to one another. The scale could be identified as reliable for the purpose it was used for. The results from each phase were therefore compared to the same sample to determine whether a difference in the quality of teamwork was experienced over the four-week period. The scale was relevant in answering the research question which aimed to determine if a change in the quality of teamwork was experienced by the healthcare students by making use of a base-line and re-evaluation. This increased the internal validity of the study as the quality of teamwork was measured against itself and minor variables were therefore present.

The main contribution to validity was the availability of qualitative data as well as quantitative data, which could be classified as construct validity. Findings of a qualitative nature could complement or contradict quantitative results and vice versa.

3.8 CONSIDERATION OF ETHICS

The ethics considered for the study are discussed by referring to voluntary participation, informed consent, confidentiality and compensation.

3.8.1 Voluntary participation

All the students were exposed to the IPE programme as this programme was part of the requirements of the fieldwork practical. The researcher discussed the information leaflet with all the students during the first contact session before the base-line

evaluation (phase one) took place. Participation in the IPE programme was compulsory as the programme forms part of the requirements of the fieldwork practical. The researcher invited the students to take part in the study by completing the reflective essay and the TWQ Scale and she highlighted the fact that no student was obligated to participate in the study. The researcher also discussed the procedure that would be followed. Each student will be allocated a research number by writing their name on the list provided. It was made clear that the researcher would never see the names of the students and that the independent person would keep the list with the numbers and names with her at all times. The independent person co-ordinated the research numbers during phase one of data collection to ensure the research numbers stayed allocated to the same participants in phase two of data collection.

The same procedure was followed as explained during phase one. The researcher left the setting after she discussed the information leaflet with the students again. The independent person gave each student an information leaflet, an informed consent form as well as a reflective essay. All the students had to hand their informed consent forms and reflective essays back whether it was completed or not even when they did not want to participate in the research study. Applying these measures ensured that the students were not coerced in participating in the research study. The independent person was responsible for collecting the completed forms. Thereafter, the independent person handed out the summarised TWQ Scale. The scale was handed out after their reflective essays were completed and handed in so that the words used on the scale could not influence the answers generated by the questions contained in the reflective essays.

The supervisor was invited by the researcher to participate in the study. The information leaflet and consent form were sent to her via email as she mentioned that she would like to participate in the study. Her participation was a voluntary decision and she was not forced to participate in any way.

3.8.2 Informed consent

The information leaflet and consent form were explained to the students by the researcher and the message was repeated by the independent person. Consent was voluntarily. The students were also informed that they were allowed to discontinue their participation at any time during the programme and could indicate so on the forms handed out to them. All the participants received the participant information leaflet as well as the consent form.

The issue of informed consent relates to the observational notes made in the journal and could be problematic as suggested in literature.⁸⁷ The independent person communicated to the researcher that during phase one all of the students involved gave consent that observational notes could be made during the study. Even though the final sample size was only 19 students for the qualitative methods and 18 students for the quantitative methods, the entire population sample of 21 students gave consent to participate in the study. The remaining two students could not participate in all four the contact sessions and were therefore excluded from the sample size. Because all of the students gave consent, it was possible for the researcher to write down observations of all the students, events and situations.

3.8.3 Confidentiality

The participants' right to privacy was respected as no names appeared on any of the completed forms. The observational notes made in the reflective journal did not contain any of the students' or children's names. The University of Pretoria would be identified in conferences, workshops and articles and would be used with sensitivity, but none of the participants or the community setting would be identifiable in the dissemination of results.

3.8.4 Compensation

No compensation was given to any of the participants.

3.9 CONCLUSION

In this chapter, the researcher described the multi-method research design and the context of the research study. For the methodology of the study four aspects were described, namely the qualitative and quantitative research assumptions; the first phase (base-line evaluation); the IPE programme and the second phase (re-evaluation). A description of the reflective journal and the pilot study, followed by a discussion of trustworthiness, validity and reliability as well as the consideration of ethics were provided. In chapter 4 the researcher discusses the findings that emerged from the qualitative data.

4 CHAPTER 4: QUALITATIVE RESEARCH FINDINGS AND DISCUSSION

4.1 INTRODUCTION

4.2 FINDINGS AND DISCUSSION

4.3 CONCLUSION

4.1 INTRODUCTION

This chapter describes the qualitative findings of the study. The themes that emerged from the study are described and a discussion of related literature follows after each theme.

The influence of exposure to an interprofessional education (IPE) programme on the development of the final-year healthcare students as interprofessional team members will be discussed. Data were generated from the reflective essays (phase one and two) completed by the final-year healthcare students. The reflective essay (phase two) completed by the clinical supervisor from the Department of Speech-Language Pathology and Audiology was not used as a primary data source. The qualitative objectives of the study were to determine the students' expectations of teamwork before exposure to the IPE programme (phase one) as well as the students' experiences of teamwork after exposure to the IPE programme (phase two). Another qualitative objective was to determine the experiences of the speech-and-audiology clinical supervisor with regard to the students' exposure to the IPE programme. The findings and discussion of the qualitative data of the study will now be discussed.

4.2 FINDINGS AND DISCUSSION OF QUALITATIVE DATA

The data generated from the final-year healthcare students during phase one and phase two were analysed separately. The expectations of the students, generated prior to the implementation of the IPE programme, could be summarised in three

themes. The data generated after three IPE contact sessions, were also analysed and the findings indicated the same three themes. The findings of phase one and two are therefore discussed together under each of the three themes. The notes of the clinical supervisor were used to support the themes and categories identified as the notes were not a primary data source. The three themes identified were: 1) outcomes of teamwork, 2) an optimal teamwork environment and 3) the attributes of team members. Figure 4.1 illustrates the themes and categories that emerged from this study:

<p>Theme one: Outcomes of teamwork</p>	<ul style="list-style-type: none"> • Category 1: Beneficial to the client • Category 2: Beneficial to the student <ul style="list-style-type: none"> • <i>Sub-category 1: Professional learning</i> • <i>Sub-category 2: Social learning</i> • <i>Sub-category 3: Personal and emotional learning</i>
<p>Theme two: An optimal teamwork environment</p>	<ul style="list-style-type: none"> • Category 1: Non-judgmental and respectful attitude • Category 2: Supportive team • Category 3: Safe and consistent work space • Category 4: Clear expectations
<p>Theme three: The attributes of team members</p>	<ul style="list-style-type: none"> • Category 1: Contribution • Category 2: Communication

Figure 4.1: Summary of the themes and categories of the study

The themes and categories that emerged from the study are discussed below.

4.2.1 Theme one: Outcomes of teamwork

Table 4.1 is a summary of the expectations (phase one) and the experiences (phase two) of the students related to the first theme. The two categories of this theme are 1) beneficial to the client and 2) beneficial to the student.

Table 4.1: The expectations and experiences of the students related to the outcomes of teamwork (theme one)

Expectations (phase one)	Experiences (phase two)
Category 1: Teamwork to benefit the client	
Expect teamwork to benefit the client.	Observed positive outcomes of client care.
Category 2: Teamwork to benefit the students	
Students expect: <ul style="list-style-type: none"> • to gain knowledge or to learn. • teamwork to prepare them for their future career. • to experience work satisfaction from teamwork. 	Learning and growth were experienced by the students in the following areas: <p><u>Sub-category 1: Professional learning</u></p> <ul style="list-style-type: none"> • Learning related to other professions. • Learning related to own profession. • Capabilities improved. • Preparation for future career. <p><u>Sub-category 2: Social learning</u></p> <ul style="list-style-type: none"> • Communication and sharing improved. • Built new professional relationships. <p><u>Sub-category 3: Personal and emotional learning</u></p> <ul style="list-style-type: none"> • Perspectives about teamwork changed. • Realised the importance of teamwork. • Confidence improved. • Positive and negative emotions resulted in growth.

The students described that they experienced IPE as beneficial to the client and to the students. The findings of the two categories will now be discussed.

4.2.1.1 Category 1: Teamwork to benefit the client

The students highlighted that teamwork should be beneficial to the client as the client should receive quality treatment. The students expected to see the positive effect that teamwork had on the client. The majority of the students, 16 out of 19 students (84.2%), mentioned in 28 different statements that they expected working together would benefit the client. One student noted:

[...] keeping in mind that it's not about the healthcare provider but about the client. [Writer's brackets] Occupational Therapy student (OT) 6

It was clear that most of the students expected the focus to be on the client. This was also the experience of the students as indicated in phase two of data generation. The reflections of the students clearly indicated that positive outcomes related to client care were observed.

Phrases such as “each session showed progress”, “see the influence of teamwork on the client” and “see the effect of a team on the treatment” indicate that clear evidence of improvement in client care was observed by the students. One student stated the following:

I have learned how good it is to work in a team, things I observed during the week with regard to mouthing we incorporated with the feeding and it worked well as our client could feed herself, it was awesome to see it and I felt very proud about how well our teamwork influenced the outcome of our client. OT3

Although improvement in client care was observed, the real impact of teamwork on the client was not measured. Further investigation to measure this impact is suggested.

4.2.1.2 Category 2: Teamwork to benefit the students

The students expressed that it is not only important that the client should benefit from teamwork but also the students themselves. In the first phase the students noted that they expected to gain knowledge through the teamwork sessions, to be prepared for their future career as a healthcare professional and ultimately

experience work satisfaction from teamwork. The students in phase one did not elaborate on the areas they would have liked teamwork to benefit them as noted in phase two. The student said:

[...] we expect it [teamwork] to be an educative experience as well as eye-opening by the end. Physiotherapy student (PT) 17

Similarly in phase two, the students indicated that they experienced teamwork as beneficial for themselves but the descriptions provided were much more in-depth than in phase one. The students elaborated on the learning and growth which they experienced. The students described participation in the IPE programme as “an exceptional learning curve” in which they “grew in more ways than one” and where “development took place”. The students elaborated on the learning and growth that took place. The following sub-categories were identified: 1) professional, 2) social and 3) personal and emotional learning and growth. Each sub-category will be described separately below.

Sub-category 1: Professional learning and growth

Professional learning was prominent as all 19 of the students (100%) noted some form of professional learning developed as a result of interprofessional teamwork. Students learned specific aspects of assessment and treatment from each profession. From the occupational therapy students the team members gained knowledge about “positioning”, “stimulatory activities”, their “roles”, the “treatment goal”, the “NDT approach”, “therapeutic relationship”, “head, neck and trunk stability” and “therapy tips”. From the physiotherapy students team members learned about “lung management” and “percussions”, “aspiration”, “head, neck and trunk stability”, their “scope” and “role”. From the speech therapy students team members learned about “feeding techniques”, “drinking”, “communication”, “techniques on how to handle drooling”, “therapy tips”, their “scope” and “role”. One student observed the following:

I have really learnt a lot from other team members over the last 3 weeks. With speech therapist, I've learnt different feeding techniques (e.g. side feeding).

From physio's I've learnt how they check for aspiration on the lungs. From fellow OT's I've learnt different positions techniques with different children.

OT9

The students made it clear that they did not only learn from other professions, but they also learnt about their own profession. The students not merely gained knowledge but also indicated an improvement in their own capabilities:

This was an extraordinary learning experience for me personally – not only did my knowledge on other disciplines increase, but also my knowledge and abilities in my own discipline. PT16

The students also experienced the importance of teamwork to prepare them for their future career:

[...] it's really going to help me in the future as well. I would like to work one day in [a] team and this has shown me how to start doing this. OT9

If the students were not able to see the need for teamwork, students would have continued to work individually as one student mentioned:

I strongly feel (after these 3 Wednesdays) that intervention with children with CP cannot occur on an individual basis – as for example feeding cannot occur effectively without guidance from the OT with regards to positioning. Speech therapy student (ST) 18

Professionally students grew as they learned about the other professions and their own profession. Professional learning was enhanced when the IPE activities related to the future careers of the students.

Sub-category 2: Social learning and growth

The students also commented on learning and growing socially. As the weeks progressed, students felt comfortable to interact with others without the fear of failure:

I've also learnt how effective a team can work together and how much difference we can make by working together with one client. This has contributed towards my social development as well as I needed to learn how to communicate in a group and put my points of view forward without feeling afraid to do so. OT9

The students also formed new relationships during the course of meeting new colleagues. The importance of building relationships was highlighted by the following comment:

I gained more professional friends and colleagues that I can consult, when needed (in the future). ST20

The importance of gaining new colleagues was also noted by the clinical supervisor:

The students also become attached to their team members and occasionally get each other's contact details so as to keep in touch and contact each other if they see a patient in the future that may require help from another discipline.
Clinical supervisor (CS)

Social learning took place as students improved their communication and gained more professional friends.

Sub-category 3: Personal and emotional learning and growth

Students also experienced personal and emotional development over this period. Personal development was experienced as the students' perspectives about teamwork changed as one student commented:

I have transformed my way of thinking about teamwork and in how we as professionals should know each other roles and be able to refer appropriately in the future. ST19

The students realised the importance of working within a team and not only as individuals. They noted they realised they knew more than they thought when sharing knowledge in the team:

Initially I preferred working alone but in this setting I would not have it any other way [...] I also got to answer their questions which in turn also taught me a lot as I realised I know more than I think I do. PT17

The clinical supervisor also noted the importance of being open-minded to a teamwork approach:

By exposing the students at an undergraduate level to teamwork they will be comfortable with working within a team. They also see the value of teamwork and thus are more open-minded to a teamwork approach to intervention. CS

The students found that they knew more than they thought which improved their confidence and also made them feel proud of their profession:

I personally developed by being proud of my profession and realising how much I already know. OT5

Students mentioned that the positive and negative emotions contributed to their growth:

I feel that I have learnt a lot, and through all the emotions, and ups and downs I have become stronger. OT10

In summary, the students grew and developed personally and emotionally as their perspectives about teamwork changed, their confidence improved and both positive and negative emotional experiences resulted in emotional growth.

4.2.1.3 Discussion of theme one (outcomes of teamwork)

The students mostly experienced IPE as positive. Teamwork was experienced as beneficial to both the clients and the students themselves. The findings might appear to be only one sided however similar positive experiences were obtained from two other IPE studies.^{91,92} Despite the attempt of Mellor *et al.*⁹² to “direct questions to tease out negative experiences”, mostly positive learning experiences were noted by the students.⁹² When IPE is conducted in a clinical placement or has benefits for the future careers of students, they are more likely to experience IPE as positive.^{92,93} The importance of students identifying the IPE activities as relevant for their future

careers should not be underestimated.^{92,94} Buckley *et al.*⁹⁵ on the other hand, found that different student groups identified different benefits from IPE. One example was that medical students did not mention improved confidence to communicate in a team after an IPE simulation activity but all the other professions did.⁹⁵ Various reasons could have caused this variation in the results, one of which could be that different professionals had different learning requirements for IPE.⁹⁵ Even though the learning requirements of the students were not analysed separately, facilitators of IPE should know the learning needs of their students. It could be concluded that the students mostly experienced positive outcomes in our study as IPE was implemented in a clinical placement relevant to their future careers.

The students identified the clients as the focus-point of teamwork as they constantly referred to the clients in their reflective essays. Similarly an overwhelming number of the participants identified clients as the main focus of teamwork.⁹⁶ Students should see the effect that teamwork has on the outcomes of treatment. The use of reflection is one of the many ways to point out the effect they have on their clients.²⁹ Furthermore, the students perceived the importance of participating in more IPE activities as this could result in improved client care.⁹² Even though the effect of IPE on client care was not directly measured in this study, client care was still identified as an important focus in teamwork.

The students experienced teamwork as beneficial – not only to the clients but also to themselves. Learning and growth were reported on a professional, social, personal and emotional level. On a professional level, knowledge and skill were also reported after participation in IPE.⁹⁵ Gaining knowledge about the roles of team members was seen as an essential outcome of IPE^{8,96} as improved knowledge about the roles of team members could lead to improved teamwork and communication.⁹⁵ Students value gaining knowledge about the roles portrayed by professions as these roles are often unclear in a team.⁹⁷ Improved knowledge of the roles and responsibilities of team members tend to also have positive effects on the treatment of clients⁹² and the clinical experiences of students.⁴⁸ IPE facilitates an understanding not only of the various roles of professionals but also the roles of team members' own profession.⁴⁵ Understanding your own professional role can improve collaboration.⁵² Hammick *et al.*²³ identified reflection as a vital part of learning. The reflection the students took

part in after each contact session could have contributed to their learning experiences.²³ IPE should therefore include activities where team members could gain knowledge about the roles of each other and create opportunities to reflect about these roles.

Personal communication skills enhanced by social learning and growth reported by other studies as well.^{4,25,43,95} Evidence of health professionals' communication skills improving even after one short half-day IPE session was also reported in a study.⁹⁵ Interaction among team members are essential in teamwork and could be facilitated with regular team meetings.²⁷ A team-building activity could also decrease anxiety and increase interaction.⁸⁰ Team meetings and team-building activities were both included in the IPE programme and could facilitate social growth and learning. The students also highlighted the importance of meeting new future colleagues.⁵⁸ The students in the study experienced improved communication skills and gained new professional friends as an important social outcome.

The students reported a transformed way of thinking about teamwork which resulted in personal growth. Since students realised they knew more than they had thought, they gained greater confidence and this confidence engendered pride in their profession. Pride in their profession came with the realisation of the importance of their own role.⁹² According to Ponzer *et al.*⁹⁸, this perception students has of their own professional role influences satisfaction with regard to IPE. Mu *et al.*²⁵ found that positive changes in perceptions of IPE are noted despite the duration of the programme. Positive perceptions of students intensify with longer IPE programmes.²⁵ Confidence is also responsible for personal growth and vital for collaboration.²³ The students noted that they were able to handle their emotions better as a result of a supportive environment. Maintaining good social relationships within a team are essential to prevent individual burnout when healthcare is complex and taxing.⁹⁹ The students experienced positive outcomes on a professional, social, personal and emotional level after participating in an interprofessional team for three contact sessions.

4.2.2 Theme two: Optimal teamwork environment

It is essential to not only know what the outcomes of interprofessional teamwork are, but also to understand the mechanisms that lead to these outcomes.²³ Reeves *et al*¹⁰⁰ recommend that qualitative studies should report the elements that are needed to obtain these positive changes.¹⁰⁰ The next two sub-themes of this study indicated what elements/mechanisms, according to the students, led to these positive changes. The students identified an optimal teamwork environment for teamwork (theme two) as an element that led to the positive outcomes the students experienced. Theme two will be discussed in this section.

Table 4.2 provides a summary of what the expectations of the students in phase one and experiences in phase two were in relation to an optimal teamwork environment.

Table 4.2: The expectations and experiences of the students in relation to an optimal teamwork environment

Expectations (phase 1)	Experiences (phase 2)
Category 1: Non-judgemental and respectful attitudes	
Team members expected respect from fellow team members.	Team members experienced non-judgemental and respectful attitudes.
Category 2: Supportive team	
Team members expected support from fellow team members.	Team members experienced support.
Category 3: Safe and consistent environment	
Team members expected a consistent environment.	Team members experienced a safe and consistent environment.
Category 4: Clear expectations	
Team members expected clear expectations.	Team members experienced clear expectations.

The categories within the students' expectations and experiences comprised of 1) a non-judgemental and respectful attitude, 2) a supportive team, 3) a safe and consistent environment with 4) clear expectations.

4.2.2.1 Category 1: Non-judgemental and respectful attitude

The students expected a positive attitude that focused on respect:

Be humble not to think any profession is better than another. Rather work together respectfully. OT2

Students experienced not only a respectful attitude but also a non-judgemental attitude. Two students described the preferred attitude for teamwork:

It is important to have respect for each other and their roles so that in therapy they can support one another and make therapy most effective [...] I also expect no judgement from the others but support from everyone. ST22

[...] none of us all have the correct answers in terms of what the best direction to follow in treatment, but by asking questions and accepting others advice, we will be able to perform in a functional and unbiased way. The team members should be able to take advice and constructive criticism from each other. OT8

According to the students, this type of environment led to an increase in interaction and sharing and ultimately an improvement in teamwork:

It was easier to interact and ask questions to the students from the other disciplines especially because it felt that we respected each other. OT6

A non-judgemental environment in which the students felt respected increased interaction in the respective teams.

4.2.2.2 Category 2: Supportive team members

Words such as “integrate and complement”, “support”, “assistance”, and “help” described the expectation of support among the students well. The students expected to not only receive assistance but also to assist and help each other in the team. The students expected:

To assist each other: OT do the preparation and positioning together with the physio and then assisting the speech therapist in feeding. OT6

The students also experienced fellow team members as supportive. Words such as to “support each other”, “encourage”, “guide”, “help”, and “work together” described the need for a supportive team. The students noted they were less shy and more competent and confident to try new things and they were able to work as a team when they felt they were supported by their peers:

I feel less shy and more competent as we support each other and encouraged each other and success was seen. ST22

I also feel more confident to try new things when the other disciplines are there as they bring more to the table and knowing you have more hands makes one feel more comfortable to try new things. OT10

The students were also able to handle their emotions better because they did not feel alone but felt supported by other team members:

[...] my emotional state was better as opposed to working alone, because I was not alone in the sadness and could see greater moments due to all the input from the different professions. OT4

It was better to handle upsetting situations within the team as it is more focused on getting to the goal and the other team members support each other. OT6

When the students felt they were not alone they “experienced a sense of relief”, “they were better able to handle upsetting situations”, and “when they shared emotions” they felt “confident” and “comfortable” and the experience was therefore less “overwhelming and stressful”. A supportive environment leads students to trust their own abilities and skills, handle emotional situations better and feel more comfortable to participate in a team.

4.2.2.3 Category 3: Safe and consistent work space

The students preferred a safe and consistent work space in which to share and practice without the fear of making mistakes. They preferred working with their peers as they felt less scared to make mistakes. This safe environment caused them to contribute and share more in the group as they felt valued. Anxiety decreased as no marks were given for teamwork:

It was also a safe zone as we as students had the opportunity to [treat the clients/participate in a team] without having marks given. OT3

The clinical supervisor also observed the development of the students from being initially uncertain to becoming more relaxed as the weeks passed:

When the students started with this practical they always seem unsure of themselves and a bit intimidated by the other disciplines presence. Initially the students from one discipline huddle together, as the weeks progress the students become more relaxed with working as part of a team [...] the students become more open and started to ask many more questions so as to learn from each other. CS

The students tended to contribute and interact more when they felt the environment was safe enough to make mistakes without receiving judgement from others.

4.2.2.4 Category 4: Clear expectations

The students preferred the expectations to be clear. One student said that “it [teamwork] also got easier as time went on” and “it was especially good to be in the same team for this whole time – with the same OT and ST”. The researcher would further like to contend that teamwork was easier partly because the students knew what the expectations were, and because the teams worked with the same members during the three weeks. As one student observed:

We weren't sure what to expect and we were more doing out individual duties with a bit of assistance from one another. We as a team knew more of what to

expect and started working very well together explaining what and why we did a certain technique/activity. ST22

Clear expectations resulted in improved confidence and more co-ordination in the teamwork.

The students preferred a non-judgemental, respectful, supportive, safe and consistent environment with clear expectations. This type of environment brought about improved confidence, skilled communication, interaction, sharing and contribution and made the students feel more competent and at ease in their respective teams. A supportive environment helped the students to deal with negative emotions and a consistent and more familiar environment resulted in decreased anxiety levels. This optimal teamwork environment described by the students, resulted in growth and development of the team members on various levels and ultimately led to effective teamwork.

4.2.2.5 Discussion of theme two (an optimal teamwork environment)

The students described an optimal teamwork environment containing 1) a non-judgemental and respectful attitude, 2) a supportive team and 3) a safe and consistent work space with clear expectations. The students preferred an environment where openness, respect and support were present as this led to improved confidence, interaction and sharing in the respective teams. Teams can only function effectively when team members trust, appreciate and respect each other.⁴⁸ Mutual respect among team members are needed for effective collaboration.¹⁰¹ For effective teamwork a “co-operative, non-judgemental” environment should be created.³⁵ According to the students in our study, a non-judgemental and respectful attitude leads the students to interact more within the team thereby improving teamwork.

The students preferred supportive team members and a safe environment gave the students the opportunity to share more as they tended to trust their own abilities without feeling exposed to judgement. Hammick *et al.*²³ similarly suggest IPE activities to be conducted in a “safe, structured and supportive environment”.²³

Students tend to be anxious when they feel exposed to possible judgement by their peers.^{95,102} Anxiety could also be experienced when students are assessed and could result in decreased participation and interaction and ultimately no collaboration in the team.⁹² Because no assessment occurred during the IPE the students were more comfortable to ask questions within the team without the fear of failure.⁹² One might ask if no assessment was present to enhance learning, the students might not value the learning experience?¹⁰³ This was however not the case in our study. The researcher argued that the students experienced IPE as relevant for their future careers and this relevance guided learning. It was therefore possible to create a comfortable environment in which to share without the fear of making mistakes. The students also highlighted that the supportive environment enabled them to handle their emotions better.

The students also preferred a consistent work space with clear expectations. Interaction is enhanced when teams stay consistent during IPE. Facilitators should therefore safeguard stability in a group by ensuring the team members stay the same during IPE⁷⁸ as a consistent environment could lead to improved communication.

Literature identified aspects related to teamwork and environment that are essential for IPE. The environment should be as close as possible to the service delivery setting.^{23,43,45} An experiential and interactive learning environment is also essential for IPE.^{37,43,45} Exposing students to only didactic exercises are not enough to teach interprofessional competencies.⁴⁵ The principles of adult learning theory should also be used during IPE.^{45,104}

An optimal teamwork environment should be created with team members having non-judgemental and respectful attitudes, team members being supportive and having a safe and consistent work space with clear expectations.

4.2.3 Theme three: Attributes of team members

Table 4.3 provides a summary of the attributes students expected from the team members and also what attributes the students identified as essential for effective

teamwork. According to the students, the attributes of team members together with an optimal teamwork environment led to the positive outcomes identified in theme one.

Table 4.3: The expectations and experiences of the students in relation to the attributes of members in the respective teams

Expectations (phase 1)	Experiences (phase 2)
Category 1: Contribution	
The students expected team members to: <ul style="list-style-type: none"> • demonstrate skills. 	Equal contributions made by the members are essential for: <ul style="list-style-type: none"> • improved client care. • improved confidence. • the team members to participate in a team.
Category 2: Communication	
The students expected team members to: <ul style="list-style-type: none"> • exchange knowledge. 	Communication are: <ul style="list-style-type: none"> • Essential for improved client care. • Essential for improved confidence. • Enhanced when the students felt comfortable and not fearful in a group.

The comment “each team member should accept their role and responsibility in the team” makes it clear that the team members have specific attributes that are essential for teamwork. This theme is divided in two categories, namely 1) contribution and 2) communication.

4.2.3.1 Category 1: Contribution

The students expected of the healthcare professionals to have different attributes in the team. The members should contribute to the team as different professions have different skills which could benefit the client. One student said:

I think that because I, as an OT, have certain knowledge but there are “gaps” or rather things I am not trained to do such as respiration and feeding, my

expectation is that we as a team will fill in the gaps we all have and thereby create a whole that better treats the patient. OT12

The team members expected to “see”, “demonstrate” or “observe” the contribution made by the various team members and how these different contributions would benefit the client:

I also expect to see a change in my client with regards to the treatment done by the other students. OT3

According to the students, contributions made by the team members were found to be essential for teamwork. Phrases such as “assist with”, “contribute equally”, “show the others”, “participate equally” and “learn how to allow each other to do”, indicated that they value the contributions made by others in the team. The students were more likely to continue to participate in teamwork when the members in the team contributed equally. One student even said that because he/she was valued in the group, he/she put in some extra effort to be able to contribute more each week:

Not only did I feel like a valuable member of the team each week but once I knew enough about the child we worked on, I was able to do research and ask my supervisor so I contributed more each week to the treatment. PT17

Finally I have learnt that teamwork can work if every member of the team contributes equally. PT17

4.2.3.2 Category 2: Communication

Communication was listed as an attribute team members need for teamwork. The students expected of their fellow team members to communicate and “exchange knowledge” as this could benefit the client and clarify the different roles of the team members:

My expectation of the team is that the speech therapist, physiotherapist and OT [to] communicate and interact effectively between one another so that intervention for this special population will be the best it can be. ST22

Communication (category 2) was described by making use of the following phrases: “transfer own knowledge to others”, “sharing information and ideas”, “interact”, “ask questions”, “say your say”, “fluent discussions”, “share our knowledge”, “effective communication” and “put my points of view forward”.

Communication was important to the students as this skill improves client care. The students noticed that communicating with team members made therapy (both assessment and treatment) much more effective as they could explain their goals and the purpose of specific treatment techniques more easily. A student explained that he/she could:

[...] figure out and discuss the most effective ways for the child to reach their full potential. ST22

Communication is enhanced when the team members “feel more comfortable with each other”:

As we got more relaxed to one another, we were more comfortable to share our knowledge on our specific field. OT7

Fear of failure limits communication as mentioned by one student.

This has contributed towards my social development as well as I needed to learn how to communicate in a group and put my points of view forward without feelings afraid to do so. OT9

Self-confidence and communication are closely related. Communication improved as the confidence of students to share their skill improved and vice versa:

As the weeks progressed, I experienced the different members not only gain more confidence in their own skills but we also became more comfortable to share our knowledge with each other. As well as became more confident in setting shared session goals and working towards the same aims. ST18

My communication with team members improved and also my self-confidence working with other professionals from other disciplines. PT16

The same improvement was noted by the clinical supervisor as she observed how the students became confident in their capabilities as they shared information related to their role and what they knew about client care for this specific group of children. She further noted that this led to professional growth and learning that was experienced and observed:

Furthermore, students had to “be on their toes” as they were required to share information regarding their discipline to the students from other disciplines that were present. This included general information such as the role of a speech therapist as well as client specific information such as how to adapt feeding with children that present with a tongue thrust. At the end of each session each student from the different disciplines always indicated that they had learnt something new. The students also indicated at the end of the block that they enjoyed working in a team as they learnt many things that they can utilize in their therapy sessions with other clients [...]. The students have grown academically as they were more confident with what they are doing and are more willing to share information with the rest of the team members. They also learn a lot from each other. CS

The clinical supervisor noted that as the weeks passed the students communicated more as they asked questions and listened to each other. The students had to explain why they thought a specific technique would work. This allowed the students to solve problems, integrate ideas and be creative:

I noted that as the weeks passed, the students become more open and started to ask many more questions so as to learn from each other. When the students work with students from their own discipline they take for granted the fact that the student they working with know the rationale behind what is being done and thus explaining what is being done and why is not needed. When students work in a team they are required to share their therapy goals and rationale behind their goal as well as listen to other team members goals and come to a solution on how to in cooperate each disciplines skills to achieve optimal and obtainable goals with their patient. This requires problem-solving, integration and creativity. CS

According to the students, communication between team members improved client care. Communication also improved the confidence and skills displayed by team members and as their confidence improved their communication with each other also increased. Both contribution and communication were identified as important attributes to improve teamwork that will lead ultimately to positive outcomes.

4.2.3.3 Discussion of theme three (attributes of team members)

Contribution was valuable to the students as the confidence of team members was enhanced and the contributions made by the team members encouraged them to contribute more to the team. The students listed contribution and communication as important attributes of team members. Contribution tends to motivate team members to continue to contribute to the team as it enhances the confidence of team members and improves teamwork. The students also identified the importance of equal contributions among team members in order to promote collaboration.⁹² Contribution facilitates trust in teams¹⁰⁵ which could in turn create a supportive environment. Klopper, Koornhof, Bester and Bardien¹⁰⁶ stated that interprofessional teamwork encompass members that respect the contribution of other team members.¹⁰⁶ When team members feel their contributions are respected in a team, they feel valued.⁹² The observation made by team members that they could be valuable and resourceful to a team is essential for collaboration.^{96,107} Team members should therefore contribute to their team as contribution leads to improved teamwork and improved teamwork leads to positive outcomes.

The students also identified the importance of communication for effective teamwork to take place after participation in IPE.^{43,92,108} The theory of communicative action by Jürgen Habermas was derived from the concept that communication has two embedded functions, namely that knowledge or an idea is expressed, but it could also perform a specific function such as making a decision, establishing relationships, building a team or improving self-confidence.¹⁰⁹⁻¹¹¹ Clients are more likely to receive quality care when team members are able to communicate effectively.⁵⁴ McPherson *et al.*¹⁰⁷ state that for effective teamwork to take place, team members need good interpersonal skills such as communication, sharing and

listening.¹⁰⁷ Poor communication skills are identified as a major factor that hinders teamwork. Although communication skills are a vital factor for effective teamwork, according to available literature, not a lot of time is currently spent at most higher education institutions to train students to improve their communication skills.^{21,53} The students highlighted that confidence and communication are closely related. When members interact the confidence of members tend to improve.⁹² Communication, together with contribution, were identified as two important functions that team members should fulfil for effective teamwork and to ultimately, reach positive outcomes.

4.3 CONCLUSION

This chapter presented the qualitative findings of the study in three themes. The findings and the discussion with relevant literature were included in this chapter. The first theme was described as the outcomes of interprofessional teamwork with two categories: 1) the benefit to the client and 2) the benefit to the student on a professional, social, personal and emotional level. The second theme discussed was the facilitation of an optimal teamwork environment for interprofessional teamwork and comprised of 1) a non-judgmental and respectful attitude among team members, 2) a supportive team, 3) a safe and consistent work space with 4) clear expectations. The third theme, which is the desired attributes of team members for effective teamwork, suggests that members should 1) contribute and 2) communicate in the team. The second and the third themes were identified as the mechanisms that can lead to the outcomes mentioned in theme one. Chapter 5 will present the quantitative results of this study. The results and discussion of the quantitative results, similarly to this chapter, will appear in Chapter 5.

5 CHAPTER 5: QUANTITATIVE RESEARCH RESULTS AND DISCUSSION

5.1 INTRODUCTION

5.2 QUANTITATIVE RESULTS AND DISCUSSION

5.3 CONCLUSION

5.1 INTRODUCTION

The quantitative data aimed to determine the experiences of the final-year healthcare students with regard to the quality of teamwork before and after exposure to the interprofessional education (IPE) programme. A summarised Teamwork Quality (TWQ) Scale, previously described in chapter 3, was used to collect the quantitative data. The purpose of the quantitative data was to enhance, support or contradict the qualitative data presented in chapter 4. The summarised TWQ Scale consists of ten categories. The results and the discussion of each of the ten categories will be described separately in this chapter.

5.2 QUANTITATIVE RESULTS AND DISCUSSION

5.2.1 Participants

The total sample size for the study was 18 final-year healthcare students. Table 5.1 indicates the total of the participants from each healthcare profession.

Table 5.1: The total of the participants from each healthcare profession

Description	No of Participants
Total participants	18
Final-year occupational therapy students	11
Final-year physiotherapy students	2
Final-year speech therapy students	5

According to Table 5.1 it is clear that the different professions were not equally represented. The results of the different professions could therefore not be compared. A total of 17 female students and only one male student participated in the study. No distinction was made between the results of the female and male participants.

5.2.2 Data collection instrument and analysis

The summarised TWQ Scale was used to determine the quality of the teamwork before and after exposure to the IPE programme. The summarised TWQ Scale consists of 50 items divided in ten categories. Table 5.2 below indicates the ten categories represented in the scale.

Table 5.2 Categories of the summarised Teamwork Quality Scale⁷⁶

Category	Description
1	Communication
2	Co-ordination
3	Balance of member contribution
4	Mutual support
5	Effort
6	Cohesion
7.	Effectiveness
8.	Efficiency
9.	Work satisfaction
10.	Learning

Each of the categories have five items that defines the category, adding to a total of 50 items. The items were not grouped together in the different categories but shuffled. The questions of the summarised TWQ Scale were presented in the form of a 5-point Likert scale from “completely agree” to “completely disagree”

Each of the five answers was allocated a specific number in order to obtain a total for the specific category, for example “completely agree” was allocated five points and the section “disagree” was allocated one point. Four of the 50 items of the original

TWQ Scale are listed in the negative and the allocation of marks had to be reversed for these four items. The results from phase one and phase two were compared to determine whether a change could be detected in the quality of teamwork after the implementation of the IPE programme.

In total, only four items in the summarised TWQ Scale were not answered. No reasons were found for these omissions as these different items are from various categories. The decision was made to substitute the items left out with the average of the particular items. Substituting these items with a zero would have had an impact on the results. This substitution was done with all four of the items omitted.

The quantitative data before (phase one) and after (phase two) the implementation of the IPE programme were compared with the use of the Statistical Package for Social Sciences (SPSS) for Windows, Version 23.0 Chicago: SPSS Inc. The data from the 18 participants in phase one were compared to the data of the same 18 participants in phase two. The related-samples Wilcoxon signed rank test for nonparametric results in the SPSS program was used. Table 5.3 indicates the summary of the quantitative results obtained from the study.

Table 5.3: Summary of the analysed quantitative results

Phases	Sum	Mean	Standard deviation	P-value	
Communication 1	401.0	22.3	2.9	0.327	P>0.05
Communication 2	410.6	22.8	2.9		
Co-ordination 1	353.0	19.6	3.2	0.001**	P<0.01
Co-ordination 2	408.0	22.7	2.4		
Contribution 1	374.0	20.8	2.6	0.007**	P<0.01
Contribution 2	404.0	22.4	2.6		
Mutual support 1	381.0	21.2	2.8	0.003**	P<0.01
Mutual support 2	417.0	23.2	2.1		
Effort 1	369.0	20.5	3.1	0.004**	P<0.01
Effort 2	407.0	22.6	2.8		
Cohesion 1	386.3	21.5	2.7	0.049*	P<0.05
Cohesion 2	413.0	22.9	2.9		
Effectiveness 1	324.0	18.0	3.9	0.000**	P<0.01
Effectiveness 2	392.00	21.8	2.6		
Efficiency 1	356.1	19.8	3.2	0.004**	P<0.01
Efficiency 2	400.0	22.2	3.3		
Work satisfaction 1	405.6	22.5	2.9	0.039*	P<0.05
Work satisfaction 2	426.0	23.7	2.1		
Learning 1	417.0	23.2	2.7	0.131	P>0.05
Learning 2	431.0	23.9	1.7		
** Correlation is significant at a <0.01 level					
* Correlation is significant at a <0.05 level					

The sum in column one indicates the total for the five items from the related categories of all the participants. The sum of phase one and phase two will be compared. The mean (average), standard deviation and P-value are also indicated in the table. The standard deviation “indicates how values vary about the mean of the distribution”.¹¹² It is clear that the distribution of results were closely related. Each of the ten categories (see Table 5.2) is described separately in the sections to follow with reference to the five items asked in the summarised TWQ Scale.

5.2.3 Communication

5.2.3.1 Results of communication

The five items related to communication directly quoted from the summarised TWQ Scale are listed below (Table 5.4) with the results mentioned thereafter.

Table 5.4 The summarised Teamwork Quality Scale items⁷⁶ related to the category of communication

<i>There was frequent communication within the team.</i>
<i>The team members communicated spontaneously.</i>
<i>The team members communicated mostly directly and personally with each other.</i>
<i>Relevant information was shared openly by all team members.</i>
<i>The team members were happy with the usefulness of the information received from the other team members.</i>

Communication was defined according to the frequency, spontaneity, quality, relevancy and usefulness of communication.⁷⁶ The table below indicates the results from the category of communication.

Table 5.5: Results regarding communication

Category	Sum	P-value	
Communication 1	401.00	0.327	p>0.05
Communication 2	410.62		

A slight improvement was noted in the sum of phase one (401.00) and the sum of phase two (410.62), but the related-samples Wilcoxon signed rank test for nonparametric results indicated no significant changes in communication after the implementation of the IPE programme. The significant value is 0.327 resulting in the P-value being more than 0.05. No significant improvement in the frequency, spontaneity, quality, relevance and usefulness of communication (as defined by the summarised TWQ Scale) was therefore perceived by the students.

An overview of the IPE programme implementation is provided in Table 5.6 in order to refer to the steps in the discussion sections of this chapter.

Table 5.6: interprofessional education programme

Nr.	Summary of the steps followed in the Interprofesssional Education programme
1.	Orientation: Revise the interprofessional teamwork process and divide the students into teams. Allocate clients to each student group.
2.	Team building activity: Get acquainted with the team members.
3.	Team meeting before the session: Face-to-face meeting to determine the objectives, session targets and role identification.
4.	Interprofessional teamwork: Assessments or treatment interventions to be conducted.
5.	Team meetings after sessions: Face-to-face meeting to evaluate the session conducted in step 4.
6.	Team reflections: All the teams meet for team reflections.

The results of category 1 (Communication) are now discussed.

5.2.3.2 Discussion related to communication

An improvement, though not significant, in the sum from phase one to phase two was noted in communication. Though various activities were included in the IPE programme for the purpose of improving communication between the team members, no significant improvement was seen. As indicated in Table 5.6, the students had to participate in a team-building activity (step 2) and had to meet before (step 3) and after (step 5) the intervention sessions to discuss and evaluate specific aspects related to the client form. According to literature, both the team-building activity and the regular face-to-face meetings could improve communication among the team members.^{27,79} According to the quantitative results of this study, these activities could have caused a slight change in communication after the implementation of the IPE programme, but no significant improvement was achieved.

On the other hand, the findings of the qualitative part of this study did suggest that the healthcare students expected communication to be an important attribute in a team and they noted improved communication in phase two (See chapter 4). Several

qualitative articles reported an improvement in communication after participating in IPE of the same duration.^{43,92}

The results that appear to contradict each other could be because the healthcare students perceived their own communication skills as of good quality, frequent enough, relevant to the intervention sessions and also useful in the team before the implementation of the IPE programme. This interpretation could be seen in the relatively high sum (the third highest of the ten categories) in the category of communication. The effect of the IPE programme was therefore not significant because the students perceived their communication skills to be good before the implementation of the IPE programme. The IPE programme did however highlight the importance of communication and this could be the reason why the students commented on communication several times in their reflective essays. Communication was not facilitated during the intervention phase (step 4) and this might have been the reason why only a small improvement was found. Literature emphasises the facilitation of communication skills during IPE.^{21,53} Regardless, the findings of the qualitative data indicated that the students experienced communication as important during teamwork.

The actual communication skills of the students were not measured before the implementation of the IPE programme. The effect of each individual activity in the IPE programme to improve communication is also unclear. Further studies should be conducted to determine how the frequency, spontaneity, quality, relevancy and usefulness of communication could be improved with the different IPE programme activities.

5.2.4 Co-ordination

5.2.4.1 Results of co-ordination

The five items related to co-ordination directly quoted from the summarised TWQ Scale are listed below (Table 5.7) with the results mentioned thereafter. One of the items in the scale was listed in the negative form. (See ***)

Table 5.7 Summarised Teamwork Quality Scale items⁷⁶ related to the category of co-ordination

<i>The work done on different subtasks was closely harmonized.</i>
<i>There were clear and fully comprehended objectives for subtasks within our team.</i>
<i>The goal for subtasks was accepted by all team members.</i>
<i>There were conflicting interests in our team regarding objectives/session targets.***</i>
<i>All members worked together to achieve the objectives/session target.</i>

Co-ordination, according to the items in the summarised TWQ Scale, was defined as agreeing upon the objectives/session targets/goals and harmonising these aspects within the team.⁷⁶ Table 5.8 below indicates the results of all the students from the category of co-ordination.

Table 5.8: Results regarding co-ordination

Category	Sum	P-value	
Co-ordination 1	353.00	0.001**	P<0.01
Co-ordination 2	408.00		
** Correlation is significant at a <0.01 level			

A significant change was found in the quality of co-ordination in the team before and after the implementation of the IPE programme. The significant value was 0.001. The P-value is therefore less than 0.01. According to the students, the objectives/session targets/goals chosen for the treatment sessions were accepted by all the team members. The teamwork to achieve these objectives/session targets/goals improved after the implementation of the IPE programme.

5.2.4.2 Discussion related to co-ordination

The results indicated that a significant improvement was perceived in the co-ordination of the team. According to the summarised TWQ Scale's definition of co-ordination, the healthcare students perceived an improvement in the team to work

together towards the same goal.⁷⁶ Loxley¹¹³ similarly states that co-ordination is facilitated when team members understand the purpose of the team.

According to Gittell *et al.*¹¹⁴, effective co-ordination in teams requires “frequent, timely and accurate communication” as well as “shared goals, shared knowledge and mutual respect”.¹¹⁴ Communication has a direct effect on co-ordination in teams.²⁷ As effective communication is needed for co-ordination in teams, the researcher could conclude that the communication skills of the students were effective in order for the co-ordination of the team to show a significant improvement. This interpretation confirms the researcher’s statement that the students perceived their communication skills as good before the implementation of the IPE programme. Co-ordination could therefore have been facilitated during step 3 of the IPE programme as the goal/objectives/session targets had to be discussed and noted on the client forms during this step. Co-ordination is further developed when the benefit of teamwork is recognised.¹¹³ The evaluation of the sessions in step 5 and reflections in step 6 could have assisted the students to recognise the benefits of teamwork for the client and for themselves. A combination of the steps of the IPE programme mentioned could have resulted in the significant improvement of co-ordination in the group.

Although this category did not surface in the qualitative data with reference to the benefit of teamwork, it was highlighted in theme one (outcomes of teamwork). The importance of communication was highlighted in theme three (the attributes of team members) and the importance of mutual respect was mentioned in theme two (an optimal teamwork environment). The qualitative findings in theme two also suggested that clear expectations improve teamwork and co-ordination (see chapter 4).

Co-ordination improved when the team members worked towards the same goal, communicated frequently, respected each other, saw the benefit of teamwork and when the expectations during teamwork were clear. A combination of discussing the goal (step 3), evaluating the intervention (step 5) and reflecting to understand the benefit of teamwork (step 6), could have facilitated the significant improvement perceived in co-ordination within the respective teams.

5.2.5 Balance of member contribution

5.2.5.1 Results of member contribution

The five items related to contribution as directly quoted from in the summarised TWQ Scale are listed in Table 5.9. The results of contribution are discussed thereafter. The negative statements in the scale are indicated with an “***”.

Table 5.9 Items about member contribution in the summarised Teamwork Quality Scale⁷⁶

<i>The team recognized and used the specific potentials (strengths and weaknesses) of individual team members.</i>
<i>The team members were contributing to the achievement of the team’s goals in accordance with their specific potential.</i>
<i>Imbalance of member contribution caused conflicts in our team.***</i>
<i>All members contributed what they could.</i>
<i>All members explained the reason for their suggested intervention action.</i>

The contribution category can be defined as the ability of the team members to add value to the treatment of the client according to their own strengths and weaknesses. Contributions should also be balanced and members should be able to explain their own contributions.⁷⁶ The table below indicates the results obtained from the category of contribution.

Table 5.10: Results regarding member contribution

Category	Sum	P-value	
Contribution 1	374.00	0.007**	P<0.01
Contribution 2	404.00		
** Correlation is significant at a <0.01 level			

A significant change was indicated in the quality of teamwork related to contribution in phase one to phase two. The significant value is 0.007 with the P-value being less than 0.01. The significant value of 0.007 indicates a chance of less than 1% for the changes in contribution in the team to be coincidental. Therefore, according the

summarised TWQ Scale, the ability of team members to recognise the potential of other team members, the balancing of contributions from the team members and the ability to explain the reason for their contributions improved after the implementation of the IPE programme. This significant change is discussed.

5.2.5.2 Discussion related to contribution

Teamwork improves when team members see the contribution each team member makes.⁹² Team members also contribute when they believe that teamwork is beneficial to client care.^{115,116} When the students are able to see the relevancy of teamwork for their future career, the team members are more likely to participate.⁹²⁻⁹⁴ When interprofesional education was conducted in a clinical setting with students in their final-year of undergraduate studies – in line with relevant literature – students contributed in their team as they experienced teamwork as relevant. This interpretation is also in agreement with the findings from the qualitative data as contribution is listed as one of the attributes (theme three) team members expect from each other.

The students had to identify the role and contribution of each team member in step 3 (planning of intervention) of the interprofessional programme which could have also led to the significant improvement in the contributions made by the team members. When team members explain their role and contribution it enhances the contribution in the group.¹¹⁷ The students were also encouraged to ask each other questions which could have facilitated an opportunity where members could have explained their contribution to the team. The evaluation and the reflection of sessions in the interprofessional programme (step 5 and step 6) could have facilitated the students to see the effect they have on the client and could have highlighted the relevancy of teamwork. Both of these steps could have contributed to the improvement in the balance of member contribution in the respective teams.

The team members contributed more as they experienced teamwork as beneficial to the client, when they experienced the relevancy of teamwork for their future careers and when they had the opportunity to explain their role and contribution to the team members.

5.2.6 Mutual support

5.2.6.1 Results of mutual support

The five items related to mutual support directly quoted from the summarised TWQ Scale are listed below (Table 5.11) with the results mentioned thereafter.

Table 5.11: Items about mutual support in the summarised Teamwork Quality Scale⁷⁶

<i>The team members helped and supported each other as best as they could.</i>
<i>If conflicts came up, they were easily and quickly resolved.</i>
<i>Suggestions and contributions of team members were respected.</i>
<i>Our team was able to reach consensus regarding important issues.</i>
<i>Suggestions and contributions of team members were discussed and further developed.</i>

Mutual support within a team was defined according to the summarised TWQ Scale as helping, supporting and respecting suggestions and contributions of other team members.⁷⁶ The table below indicates the results of all the students from the category of mutual support.

Table 5.12: Results regarding mutual support

Category	Sum	P-value	
Mutual support 1	381.00	0.003**	P<0.01
Mutual support 2	417.00		
** Correlation is significant at a <0.01 level			

Mutual support within the team from phase one to phase two had a significant value of 0.003 where the P-value is less than 0.01 indicating that there is less than a 1% chance that the changes in mutual support from phase one to phase two were coincidental. The results indicated that help, support and respect in the team significantly improved after the implementation of the IPE programme. This change is discussed.

5.2.6.2 Discussion related to mutual support

Attitudes such as “mutual respect” are learning outcomes that should be developed during IPE.⁵⁰ Support, respect and trust are closely related. When team members trust, appreciate and respect each other teams could function effectively.⁴⁸ “Trust develops as the team members recognise and appreciate the unique skills and contributions of each other.”¹¹⁶ The students had to identify the role or contribution of each member in the group, after which these roles and contributions were implemented and evaluated in the IPE programme (step 3 to5) which could have enhanced trust and support in the respective teams.

Trust and respect are developed when team members are able to show their competency in and contribution to the team.¹¹⁷ Because the students were in their final-year of study, they had skills to share and contributions to make to the team, consequently developing an environment of trust and respect.

High levels of trust and respect are also experienced in stable teams.¹¹⁸ The students were in the same teams for the duration of the four contact sessions which could have further developed trust and respect in each of the teams.

The healthcare students were able to contribute their skills to the team as they were in their final-year of studies before they would be qualified healthcare professionals. Because the students could make valuable contributions that stayed the same over the four contact sessions, team members could respect and support each other. The steps in the IPE programme facilitate an environment of respect and support according to the qualitative findings.

The results of the study were confirmed as mutual support was also highlighted in theme 2 in the qualitative results as part of an optimal teamwork environment. The students experienced supportive team members as essential for teamwork. Contribution was identified as an attribute team members should have when functioning as part of a team (category 1 of theme 3). Contributions from members are essential to facilitate mutual support in teams.

5.2.7 Effort

5.2.7.1 Results of effort

The five items related to effort directly quoted from the summarised TWQ Scale are listed below (Table 5.13) with the results mentioned thereafter. See *** for the negative items as these items appear in the scale.

Table 5.13: Items about effort in the summarised Teamwork Quality Scale⁷⁶

<i>Every team member fully pushed the objectives of the intervention.</i>
<i>The team did not see anything special in the teamwork intervention.***</i>
<i>Our team put much effort into the intervention of the client.</i>
<i>There were conflicts regarding the effort that team members put into the intervention.***</i>
<i>Every team member made the intervention their highest priority.</i>

Effort is put in during teamwork when team members value teamwork intervention.⁷⁶

Table 5.14 indicates the results of all the students from the category of effort.

Table 5.14: Results regarding effort

Category	Sum	P-value	
Effort 1	369.00	0.004**	P<0.01
Effort 2	407.00		
** Correlation is significant at a <0.01 level			

A significant change was found in the quality of teamwork related to effort before and after the implementation of the IPE. The significant value was 0.004 which indicates that the P-value is less than 0.01. This change is discussed in the following section.

5.2.7.2 Discussion related to effort

When team members are committed to the team they are more likely to contribute^{115,116} and therefore team members will also put effort into teamwork. Contribution and effort are therefore closely related as similar aspects improve both the contribution and effort of team members. The definition of effort, according to the

summarised TWQ Scale, is when team members fully “push” the objectives of a session which will then result in team members valuing teamwork.⁷⁶ According to Mellor, Cottrell and Moran; Reeves, Goldman and Oandasan as well as Parsell, team members participate in a team when they see the value of teamwork.⁹²⁻⁹⁴

Planning (step 3) and reflection (step 6) as steps followed in the implementation of the IPE, could have contributed to an improvement in effort in the respective teams. During the team meetings to plan intervention, the roles and contributions were identified and each member had a specific responsibility. Reflection could have contributed to team members seeing the value of teamwork.

Although the word “effort” was not used in the reflective essays of students, the team members referred to “contribute”, “demonstrate” and “do”. The students experienced that students contributed more each week which they have listed as an important attribute to have within teams. According to the students, team members tend to be more committed when they make contributions to the team.

5.2.8 Cohesion

5.2.8.1 Results of cohesion

This section lists the five items directly quoted from the category of cohesion as listed in the summarised TWQ Scale (Table 5:15). The results of cohesion will then be discussed.

Table 5.15: Items related to cohesion in the summarised Teamwork Quality Scale⁷⁶

<i>It is important to all the members of the team to be part of the intervention.</i>
<i>The session targets were accepted by all team members.</i>
<i>The intervention was important to the team.</i>
<i>All members were fully integrated into our team.</i>
<i>Our team was sticking together.</i>

Cohesion, according to the items of the scale, can be defined as when team members work together in unity, when team members are fully integrated and when

they stick together.⁷⁶ Table 5.16 indicates the results of all the students from the category of cohesion.

Table 5.16: Results regarding cohesion

Category	Sum	P-value	
Cohesion 1	386.33	0.049*	P<0.05
Cohesion 2	413.00		
* Correlation is significant at a <0.05 level			

Significant changes of cohesion among the team members were indicated after the implementation of the IPE programme. The significant value is 0.049 which indicates that the P-value is less than 0.05. The teamwork of team members improved as a unity after the implementation of the IPE programme. These results are now discussed.

5.2.8.2 Discussion related to cohesion

The team building activity in the interprofessional programme (step 2) aimed to increase cohesion in the group⁷⁹ and was seemingly successful. According to Husting, the reason for an improvement in cohesion or closeness experienced by the students could have been because team members have the same positive attitude, communicated well and conformed to the set of norms.¹¹⁹ Alternatively, negative stereotyping could have caused the students to have negative attitudes towards one another preventing cohesion.¹¹⁹ However, the results of the summarised TWQ Scale of phase 2 indicated that the students perceived their communication to be effective in the team therefore contributing to a significant improvement in cohesion.¹¹⁹ According to Husting, it is also easier to experience cohesion within smaller teams.¹¹⁹ However, it is important to note that cohesion needs to be facilitated in teams⁹⁹ and this was one of the reasons why a team-building activity was included in the IPE programme.

The word, cohesion, was not used in the qualitative data, but theme two with regard to an optimal teamwork environment – specifically a supportive environment – is closely related to this category. Having a non-judgemental and respectful attitude

could also have resulted in cohesion, as suggested by Husting.¹¹⁹ The quantitative data therefore confirms the qualitative data as discussed in chapter 4.

In conclusion, the positive attitudes and effective communication skills of the students present in smaller teams together with the team-building activity could have enhanced cohesion in the respective groups. It is however not clear whether a combination or only one of these aspects was responsible for the significant change in cohesion in the teams and this issue needs further investigation.

5.2.9 Effectiveness

5.2.9.1 Results of effectiveness

Before the results of effectiveness, directly quoted from the summarised TWQ Scale, are discussed the five items that defines effectiveness is listed in Table 5.17.

Table 5.17: Items related to effectiveness in the summarised Teamwork Quality Scale⁷⁶

<i>All intervention objectives were achieved.</i>
<i>The intervention was of high quality.</i>
<i>The team was satisfied with the intervention.</i>
<i>Results were obtained with teamwork.</i>
<i>We had little uncertainty in our group.</i>

Effectiveness, according to the items of the scale, can be linked to providing high quality treatment, achieving the treatment goals and seeing the results of teamwork.⁷⁶ Table 5.18 indicates the results of effectiveness.

Table 5.18: Results regarding effectiveness

Category	Sum	P-value	
Effectiveness 1	324.00	0.000**	P<0.01
Effectiveness 2	392.00		
** Correlation is significant at a <0.01 level			

Effectiveness within the team from phase one to phase two had a significant value of 0.000 where the P-value is less than 0.01 indicating a 0% chance that the changes in effectiveness from phase one to phase two were coincidental. According to the students, an improvement in providing high quality treatment, achieving the treatment goals and seeing the results of teamwork were observed. This improvement in effectiveness is discussed.

5.2.9.2 Discussion related to effectiveness

Borrill *et al.*⁸¹ state that clear goals are directly related to the effectiveness of teams. Step 3 in the IPE programme could have enhanced the effectiveness of the teams as the purpose of this step was to achieve the goal noted for the intervention sessions. Reflection in step 6 could have assisted the students in seeing the benefit of teamwork to the client which could also have contributed to the improvement experienced in the effectiveness of the respective team.^{29,92} A combination of all the categories in the summarised TWQ Scale, such as co-ordination, a balance in member contribution, effort and efficiency, could have had an influence on experiencing teamwork as effective.

The qualitative data confirm the results as the students experienced the teamwork as beneficial to the client and to themselves (see theme one in chapter 4).

5.2.10 Efficiency

5.2.10.1 Results of efficiency

In this section the five items directly quoted from the category of efficiency in the summarised TWQ Scale are listed followed by a discussion of the results. Table 5.19 lists the five items related to efficiency as listed in the summarised TWQ Scale.

Table 5.19 Items: Items related to efficiency in the summarised Teamwork Quality Scale⁷⁶

<i>The intervention session was executed as planned.</i>
<i>Team intervention was low cost and effective.</i>
<i>Good time management was used during teamwork.</i>
<i>Our team used the resources available.</i>
<i>Our team was well organized.</i>

Efficiency can be defined as providing treatment that is well-organised and provided at a low cost. Time and resources should also be used effectively.⁷⁶ The table below indicates the results obtained for efficiency during teamwork.

Table 5.20: Results regarding efficiency

Category	Sum	P-value	
Efficiency 1	356.06	0.004**	P<0.01
Efficiency 2	400.00		
** Correlation is significant at a <0.01 level			

Efficiency within the respective teams from phase one to phase two has shown a noticeable change as the significant value of 0.004 where the P-value is less than 0.01 indicating less than a 1% chance that the changes in efficiency were coincidental. The ability of the teams to organise themselves, to provide low-cost intervention and to use time and resources efficiently was perceived as showing a noticeable improvement after the implementation of the IPE programme. These results are now discussed.

5.2.10.2 Discussion related to efficiency

The summarised TWQ Scale defines efficiency as teamwork being low-cost and well-organised and when available resources are used.⁷⁶ One of the main reasons why interprofessional teamwork and collaboration is encouraged, is because interprofessional teamwork has the possibility to reduce healthcare costs and

therefore can improve the overall efficiency of healthcare.^{2,120} Efficient teamwork is therefore needed.

A significant change in efficiency was noticed because the students perceived their team members to be well-organised and to use time and resources effectively. The clinical supervisor provided structure and clear expectations (step 1) to the teams which contributed to well-organised team members. It is however not clear what aspects or step(s) have caused the students to perceive teamwork as efficient and this issue needs further investigation.

5.2.11 Work satisfaction

5.2.11.1 Results of work satisfaction

This section describes the definition of work satisfaction as directly quoted from the summarised TWQ Scale and the results thereof. Table 5.21 lists these five items below.

Table 5.21: Items related to work satisfaction in the summarised Teamwork Quality Scale⁷⁶

<i>The team members have gained from the teamwork.</i>
<i>The team members would like to do this type of collaborative teamwork again.</i>
<i>The teamwork was experienced as positive.</i>
<i>We are satisfied with our teamwork.</i>
<i>I would like to provide healthcare services in a team.</i>

Work satisfaction can be defined as the team members benefitting from teamwork as they have experienced teamwork as positive and experienced the relevancy of teamwork.⁷⁶ If the students would like to provide healthcare services in a team in the future it would also be an indication of their work satisfaction. Table 5.22 indicates the results obtained related to work satisfaction.

Table 5.22: Results regarding work satisfaction

Category	Sum	P-value	
Work satisfaction 1	405.57	0.039*	P<0.05
Work satisfaction 2	426.00		
* Correlation is significant at a <0.05 level			

A significant value of 0.039 was indicated for the category of work satisfaction. The P-value is less than 0.05. It could be concluded that the students gained from teamwork, for example they experienced teamwork as relevant and positive and would like to continue with teamwork in the future. These results are now discussed.

5.2.11.2 Discussion related to work satisfaction

According to Curran *et al.*¹²¹, IPE is experienced more positively by female students as well as senior undergraduate students.¹²¹ The improvement in the category with regard to work satisfaction could have been because mainly female students participated in the study.¹²¹ Students are also more likely to experience teamwork as positive when IPE is conducted in a clinical setting or setting relevant to the future careers of the students.⁹²⁻⁹⁴ Evaluation in step 5 and reflection in step 6 could have highlighted the relevancy of teamwork in the particular setting, contributing to this change in work satisfaction between phase one and two. Also, effective teamwork ultimately leads to work satisfaction¹²² which was indicated in the previous section.

Therefore, as the participants were mainly senior undergraduate female students and experienced teamwork as relevant their perceived work satisfaction improved.

The qualitative findings confirm the significant improvement in work satisfaction as theme one of the outcomes of teamwork indicated the benefit to the students on a professional, social, personal and emotional level – including growth and development. The students also highlighted IPE as a positive experience.

5.2.12 Learning

5.2.12.1 Results of learning

This section describes the definition of learning as directly quoted from the summarised TWQ Scale and the results thereof. The following five items related to learning, appear in Table 5.23.

Table 5.23: Items related to learning in the summarised Teamwork Quality Scale⁷⁶

<i>We have learned from the other members during teamwork.</i>
<i>The teamwork promoted me professionally.</i>
<i>The teamwork promoted me personally.</i>
<i>During teamwork I have learned from myself.</i>
<i>Teamwork was an effective learning opportunity.</i>

The category of learning can be defined as an effective learning opportunity and when learning takes place on a professional and personal level.⁷⁶ Table 5.24 indicates the results obtained for the category of learning.

Table 5.24: Results regarding learning

Category	Sum	P-value	
Learning 1	417.00	0.131	p>0.05
Learning 2	431.00		

No significant changes were indicated for the quality of teamwork related to learning before and after the implementation of the IPE programme. The significant value was 0.131 which indicates the P-value is more than 0.05. The significant value suggests that there is a 13% chance that the changes seen in learning can be ascribed to coincidence. The category of learning, similar to the category of communication, indicated no significant change after the implementation of the IPE programme. A slight improvement was however noted in the sum of phase one (417.00) and the sum of phase two (431.00), but the related-samples Wilcoxon signed rank test for nonparametric results indicated no significant changes in learning after the implementation of the IPE. The results are discussed.

5.2.12.2 Discussion related to learning

The entire IPE programme was aimed at providing a structured programme for learning to take place. Reflection in step 6 was therefore also added to the programme to facilitate learning.^{23,29,46} However, as can be seen in the results the change in perceived learning is not significant.

It should be highlighted that the sum of learning in phase one was the highest number in the phase one category, and that can be the cause of the insignificant change in phase two. The students therefore already experienced learning during their first teamwork contact session at the particular centre, as this was their first exposure to interprofessional teamwork in a clinical setting. No similar quantitative research results were found in literature. However, the qualitative results of this study support this argument as 100% of the participants indicated that learning took place on either a professional or personal level or on both levels. Learning was also noted on a social and emotional level. Similarly Klopper, Koornhof, Bester and Bardien¹⁰⁶ found, without asking any information related to interprofessional education, that the findings indicated “more than half of the students spontaneously mentioned learning about working in an inter-professional team as one of the highlights”.

5.3 CONCLUSION OF QUANTITATIVE RESULTS

The quantitative objectives of the study were to determine the students' experience of the quality of teamwork before (phase one) and after (phase two) exposure to the IPE programme. The two phases were compared to determine the quality of teamwork with the use of the summarised TWQ Scale in ten categories. Significant improvements were noted in eight of the ten categories, namely co-ordination, contribution, mutual support, effort, cohesion, effectiveness, efficiency and work satisfaction. Even though a slight improvement was found in the categories of communication and learning after the implementation of the IPE programme, no significant improvement was found.

The results discussed in this chapter were in line with literature as well as the qualitative data of this study discussed in chapter 4. Triangulation between these sources made the results more trustworthy and the results are concluded in chapter 6.

6 CHAPTER 6: CONCLUSION AND REFLECTION

6.1 INTRODUCTION

6.2 AIM OF THE STUDY

6.3 OBJECTIVES OF THE STUDY

6.4 REFLECTIVE JOURNAL

6.5 LIMITATIONS

6.6 RECOMMENDATIONS

6.7 CONCLUSION

6.1 INTRODUCTION

This chapter aims to summarise the findings and results in relation to the aim and objectives of the study. In order to clarify the position of the researcher in the study, her reflective journal is included in this chapter. The limitations experienced in this study follow thereafter. Furthermore, the recommendations for future research studies and recommendations to educators who will develop and/or implement an interprofessional education (IPE) programme, are also discussed.

6.2 AIM OF THE STUDY

It was the aim of the researcher to determine the influences of exposure to an IPE programme on the development of the final-year healthcare students as interprofessional team members in a community setting.

The findings and results of the study indicated that the exposure of the students to the IPE programme improved their ability to function as interprofessional team members and therefore the aim was reached. The aim of the study is more clearly described through the objectives. The first set of objectives described the qualitative ingredients to improve the ability of the students to work as interprofessional team

members. The second set of objectives comprised quantitative components needed to improve the quality of teamwork. The objectives of this study that were reached, will now be described.

6.3 OBJECTIVES OF THE STUDY

6.3.1 Objectives reached through qualitative methods

The following objectives were reached through qualitative methods:

1. To determine the expectations of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students for interprofessional teamwork before exposure to the IPE programme.
2. To determine the experiences of the undergraduate final-year occupational therapy students, physiotherapy students and speech therapy students of interprofessional teamwork after exposure to the IPE programme.
3. To determine the experiences of the speech-and-audiology clinical supervisor of interprofessional teamwork during exposure to the IPE programme.

The findings were summarised in Figure 6.1. The expectations of the undergraduate final-year students, before exposure to the IPE programme (objective one) was the same as the experiences of the students after exposure to the IPE programme (objective two). These findings are supported by the experiences of the speech-and-audiology clinical supervisor (objective three). Figure 6.1 below indicates the themes that emerged from the data.

<p>Theme one: Outcomes of teamwork</p>	<ul style="list-style-type: none"> • Category 1: Beneficial to the client • Category 2: Beneficial to the student <ul style="list-style-type: none"> • <i>Sub-category 1: Professional learning</i> • <i>Sub-category 2: Social learning</i> • <i>Sub-category 3: Personal and emotional learning</i>
<p>Theme two: An optimal teamwork environment</p>	<ul style="list-style-type: none"> • Category 1: Non-judgmental and respectful attitude • Category 2: Supportive team • Category 3: Safe and consistent work space • Category 4: Clear expectations
<p>Theme three: Attributes of the team members</p>	<ul style="list-style-type: none"> • Category 1: Contribution • Category 2: Communication

Figure 6.1: Summary of themes and categories of the study

6.3.2 Objectives reached through quantitative methods

The following objectives were reached through quantitative methods:

1. To determine the perception of the final-year occupational therapy students, physiotherapy students and speech therapy students with regard to the quality of teamwork before exposure to the IPE programme.
2. To determine the perception of the final-year occupational therapy students, physiotherapy students and speech therapy students with regard to the quality of teamwork after exposure to the IPE programme.

The six-step IPE programme was implemented after phase one and before data collection took place in phase two. To remind the reader of the steps followed, Table 6.1 indicates an overview of the IPE programme.

Table 6.1: interprofessional education programme

Nr.	Summary of the steps followed in the Interprofesssional Education programme
1.	Orientation: Revise the interprofessional teamwork process and divide the students into teams. Allocate clients to each student group.
2.	Team building activity: Get acquainted with the team members.
3.	Team meeting before the session: Face-to-face meeting to determine the objectives, session targets and role identification.
4.	Interprofessional teamwork: Assessments or treatment interventions to be conducted.
5.	Team meetings after sessions: Face-to-face meeting to evaluate the session conducted in step 4.
6.	Team reflections: All the teams meet for team reflections.

The results of the quality of teamwork as perceived by the healthcare students from phase one to phase two were compared. An improvement in all ten categories of the summarised TWQ Scale was found. Only eight of these categories showed significant improvement. Table 6.2 depicts outcomes that need to be emphasised in each step if the IPE programme for each category of the TWQ Scale to improve as described in chapter 5.

Table 6.2 : Effect of the interprofessional education programme on the quality of teamwork

Categories	Steps followed in the implementation of the interprofessional education programme					
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
	Orientation	Team building	Team meeting to discuss goal and roles	Interprofessional teamwork	Team meeting to evaluate session	Group reflection
Co-ordination	Expectations were clear.		Goals were determined and communicated.		Opportunities for communication were created.	The benefit of teamwork was seen.
Balance in member contribution			Member roles were explained.	Team members contributed.	Sessions were evaluated (effect of teamwork on the client was seen).	The relevancy of teamwork and the effect on the client was seen.
Mutual support	Teams stayed the same during all of the contact sessions.		Role contributions were identified.	Competency and contributions were demonstrated.	Contributions were evaluated.	Contributions were reflected upon.
Effort			Roles and contributions were discussed.	The objectives identified for each of the sessions were followed.		The value of teamwork was seen.
Cohesion	Teams were small.	Team building activity				
Effectiveness			Clear goals were set.			The benefit of teamwork was seen.
Efficiency	Clear expectations and structure were provided.					
Work satisfaction					Evaluation highlighted the relevancy of teamwork.	Reflections highlighted the relevancy of teamwork.

Only eight of the categories showed a significant improvement after the implementation of the IPE programme, namely co-ordination, contribution, mutual support, effort, cohesion, effectiveness, efficiency and work satisfaction. The significant improvement in the abovementioned categories were the result of a combination of various outcomes within the steps of the IPE programme. It is however unclear if the influence of a specific outcome in a step was greater on the improvements found. It is recommended that the influences on the categories are further investigated.

6.4 REFLECTIVE JOURNAL

As previously mentioned in chapter 3, a reflective journal was completed by the researcher to explicitly state her role and ideas during the research process. A summary of the reflective journal appears in the section to follow and was written in the first person.

MY REFLECTIVE JOURNAL

The developing phase

My exciting research journey is about to start. My passion to teach students has caused me to undertake this research journey. How great would it be if I could develop and implement an IPE programme that could assist students to work effectively in a team? It might just be that effective teamwork will overflow to improved client care. On the one hand, I would really like this programme to benefit students and clients, but on the other hand I will have to also evaluate the programme in an objective manner. Will it be possible to separate my own ideas from reality? Upon answering this question for myself I realised that the reflective journal can be used as a tool to be transparent and reflect on this process.

This exciting research journey turned out to be quite intense. I have read in literature that it tends to be difficult to co-ordinate different professions to learn together but I had no idea that this challenge will be my reality. At times I thought that developing the programme and making all the arrangements will eventually lead to nothing as I had great difficulty co-ordinating the timetable of the speech therapy students with the other students involved. I was informed that there might be a possibility that the speech therapy students will not be

part of the interprofessional teamwork due to their curriculum changes. This could jeopardise my research. Also, interprofessional teamwork will not be as effective if only the physiotherapy and occupational therapy students collaborate. After several emails and phone calls to determine whether this will be my reality, I received an email with good news. The speech therapy students will form part of the interprofessional teamwork sessions for four sessions at the beginning of 2015. My despondency turned into a glimpse of hope.

To be honest, I did not only want to realise this interprofessional teamwork for the sake of the students and children but also for myself. I am a junior lecturer and have several new ideas related to education which I have managed to implement with success but it felt to me as if my future as an educator depended on this research. I weren't concerned about the successfulness of the programme as I knew the research will be able to highlight the mistakes and successes of the programme. It is great to see when something you have developed is successful but finding out what should be changed in the programme could ultimately lead to success.

What concerned me was that this research was supposed to turn out as my research for my Masters degree in Occupational Therapy. Obtaining a Masters degree when you want to continue your future career as an academic is essential. I was therefore quite relieved when my research could continue as planned. This feeling allowed me to move my focus away from the research and focus on my passion for teaching.

The first contact session

The first day of interprofessional teamwork has arrived and I experienced mixed feelings. I am excited for the possible benefit teamwork could have in the setting but I am also slightly nervous to meet a new group of students which I have never seen before (except the occupational therapy students of course). Will all the student groups pitch at the centre?

It is important to stick to what I have planned for the first contact session. All of the student groups did arrive at the centre (thank goodness!) and I am a bit more at ease. It appears to me that I am not the only one anxious for the teamwork this morning as the students are less interactive today. They are also anxious. It is understandable as they do not know what to expect from this morning, they do not know each other and the centre is an unfamiliar setting to most of them. I arranged with the manager of the centre to introduce the centre to the students and I explained how the morning will work. The students were divided into different teams and allocated to different children in the centre. No facilitation to enhance teamwork was implemented except for encouraging the students to start working with the different

children. I walked around in the centre to supervise the students and to discuss the children with each group. I walked to the different teams to give advice and ideas related to their children. Teaching students in the clinical field is one of my many passions in life. As I am fulfilling my role as a clinical supervisor, and enjoying it, I quickly forgot that this is the first contact session of my research. Only after I saw the independent person arriving at the centre to assist me with the data generation and collection, I realised it is my first contact session of my research.

The second contact session

During the second contact session the students are observably more at ease. I explained in detail what will be expected of them and introduced the IPE programme to them. A team building activity was used to make sure the students get acquainted with each other. After the team building activity the purpose of the client form was discussed. The teams discussed and completed the first part of the form before the intervention session. They will evaluate the intervention on the second part of the form after the session. I encouraged the students to ask questions in the group and told them it is “okay” if they do not know the answer as they could find out what the answer was and tell the group during the next contact session. The students started immediately and no encouragement was needed for the teams. I walked from team to team and asked questions and facilitated some problem-solving in the groups. When all the teams were finished, I called them to make a big circle outside the centre. The students were asked to reflect verbally about the interprofessional teamwork and to explain what they have learnt about their own profession and what they have learnt from the other professions. I facilitated a discussion with the use of various leading questions. The students were eager to share and they mentioned very specific aspects of the session. The students mentioned the following things they have learnt:

- The way the faces of children should be wiped when they tend to drool.
- Feeding children correctly.
- The scope of physiotherapists when they treat the children with phlegm.
- The role of each profession in the team.
- Facilitating weight bearing in assisted standing.

I observed the students speaking to each other after the session. They were speaking about things related and unrelated to therapy. Social interaction was observed after all the formal activities were finished for the morning.

The third contact session

With the third contact session the IPE programme was implemented for the second time and therefore the students participated in the same activities. After the team-building activity the students had difficulty getting together to treat the different children in their teams. During teamwork I walked from team to team. I observed the excitement of some of the students as they saw improvement in the children's functioning over the last two sessions. Some students also verbalised their confusion as the children did not react to the stimuli as the students have hoped they would. The students were asked to reflect in the group and they mentioned several aspects they have learnt including:

- The effect of different textured food on oral sensitivity.
- The excitement of the team when children managed to feed themselves with spoons that they almost forgot to swallow the food.
- The need to use the Neurodevelopmental Theory as preparation to feed the children.
- The children sometimes appeared to be difficult but it could just be because they have preferences for specific toys.
- Working and learning in a team is valuable learning experience.

The fourth contact session

The fourth and final contact session arrived and I was slightly worried as this was also the final day for data collection and data generation.

During the reflection the students mentioned that they have learnt specific aspects during the teamwork:

- Improvement in the hand function of children was observed.
- The positive effects of everyone working together were observed.
- The different roles of the team members were perceived which could make referrals in the future easier.

The independent person managed the data collection and generation process and I walked out of the centre. I experienced feelings of despondency because the last facilitation of the IPE programme was over (for now). Thinking about the different contact sessions made me realise that the effort to co-ordinate the timetables were all worth it. I felt excited about interprofessional teamwork and the positive effects on the outcomes of the children. Uncertainty however overwhelmed me as the data collection sheets and the data generation

documents were waiting to be analysed. Where do I start with these heaps of information? How should I interpret the information through the eyes of an outsider without manipulating the data to suite my ideas? The reflective journal was definitely a tool to make sure I explicitly explain my thoughts and ideas. I reflected honestly about what I have observed and experienced and decided to continuously reflect during the data analysis and interpretation phase.

The journal managed to provide an opportunity to explicitly state the researcher's position and therefore the transparency of the research process was improved. The limitations of the study identified by the researcher are mentioned in the section to follow.

6.5 LIMITATIONS

Limitations are inherent in any research and should clearly be stated in all academic work.¹²³ Several limitations were present in this study. In line with a number of other IPE related studies the sample size of the students was relatively small and all the professions involved were not equally represented.⁹⁵ The data obtained from the students from different professions could therefore not be analysed individually.⁹⁵

When learning are reported in a retrospective way after learning has occurred, it is difficult to really understand the extend of learning as it occurred.¹²⁴

Another limitation was that the researcher was the facilitator of the IPE during the four contact sessions and this could have caused the students to only note the aspects that they thought the researcher would like to hear.

The reflective journal was written within three to four days after the interprofessional teamwork contact sessions took place and not directly after each of the sessions.

Member checking was not possible in this study as explained in chapter 3.

The development of the students over the four contact sessions could have been influenced by various other aspects. For this reason the different healthcare disciplines have been analysed together.

6.6 RECOMMENDATIONS

6.6.1 Recommendations for interprofessional education programme developers:

- When an IPE programme is introduced, it should be presented in a structured format.
- Interprofessional teamwork should be facilitated in a clinical setting for the participants to identify the relevancy of teamwork for their future careers.
- Reflection should also be included in the programme.
- Activities should be included where students could understand each other's roles and contributions.
- The focus of teamwork should be on improving patient care.
- The different student groups should understand their own roles and contribution in their group. Roles and contributions should be established during the earlier years of the students' undergraduate studies.
- As equal contributions by all the team members was seen as very important, this should be encouraged during interprofessional teamwork.
- Opportunities for communication among team members should be scheduled. Team meetings to discuss and evaluate the goals set for the clients could be very valuable.
- A team-building activity before teamwork starts should be included to facilitate cohesion in the team.
- Small teams that stay the same for the duration of teamwork are advisable.
- An optimal teamwork environment should be created for the team members to be able to work most effectively. One can achieve this environment by making team members aware to not be judgemental but to be respectful and supportive towards their fellow team members.
- Communication skills for effective teamwork should be part of the IPE programme. The exact timing when communication skills should be introduced is however not clear.
- The steps followed with regard to the components of the IPE programme as listed in Table 6.5 should be used as a guideline for educators to develop their own IPE programme specific to their clinical setting.

6.6.2 Recommendations for future studies

- The impact of the IPE programme on clients should be measured.
- The quality of teamwork, specifically communication and learning, should be measured before interprofessional teamwork commences.
- Further studies should be conducted to determine how the frequency, spontaneity, quality, relevancy and usefulness of communication could be improved within different IPE programme activities. The effect of each individual activity in the IPE programme to improve communication is also unclear.
- The learning needs of students for teamwork should be investigated as the outcomes are directly linked to the learning needs of students.
- The effect on students when the IPE programme is implemented for longer or shorter periods should be investigated.
- The impact of presenting sessions on communication before interprofessional teamwork and facilitating communication during the interprofessional teamwork should be examined.
- Future studies should determine which activity/activities or step/steps contributed to which outcome.

6.7 CONCLUSION

The aim of the study was answered by addressing the objectives. The qualitative and quantitative objectives were summarised. The reflective journal of the researcher and the limitations of the study were also referred to in this chapter. Recommendations for IPE developers and for future studies that are similar in nature were also made.

This study clearly indicates that the Interprofessional Education Program used in this study had an influence on the development of the final-year healthcare students as well as the team. The development of the students could be seen on a professional social, personal and emotional level. The students also perceived the quality of teamwork to have improved after the implementation of the Interprofessional

Education Program. Table 6.2 provides a clear picture of the possible changes/development that could be achieved with each step of the Interprofessional Education Programme. Interprofessional education programme developers will be able to use this Interprofessional Education Programme as guidance when teamwork in similar settings is planned.

The references (University of Pretoria, Vancouver Referencing Style) used in this dissertation appear in the next section followed by the annexures.

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ANNEXURES

Some annexures omitted in this version for confidentiality reasons

ANNEXURE A: Qualitative data generation: Reflective essays for students (phase one)

ANNEXURE B: Evidence of correspondence with Hoegl and Gemuenden via email

ANNEXURE C: Quantitative data generation: Reflective essays for students (phase two)

ANNEXURE D Quantitative data generation: Reflective essay questions for the clinical supervisor

ANNEXURE E: Summarised Teamwork Quality Scale

ANNEXURE F: Different team building activities used in the study

ANNEXURE G: Client form used for the interprofessional education programme.

ANNEXURE H: Quantitative data collection: Microsoft Office Excel 2010 spread sheet

ANNEXURE I: Ethical clearance letter

ANNEXURE J: Editor's declaration letter

ANNEXURE A:
Qualitative data generation: Reflective essays
(phase one)

REFLECTIVE ESSAY (Phase one)

Date: _____

25/02/2015

Nr

Encircle the appropriate answers below:

Student from:	Occupational Therapy	Physiotherapy	Speech Therapy
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Answer the following questions as comprehensively as possible:

Write down your expectations of teamwork in this particular setting.

ANNEXURE B:

Evidence of correspondence with Hoegl and Gemuenden via email

EVIDENCE OF CORRESPONDENCE WITH THE AUTHORS OF THE TEAMWORK QUALITY SCALE

MARTIN HOEGL AND HANS GEORGE GEMUENDEN (2001)

An email was send to M. Hoegl and H.G.Gemuenden to ask permission to use their Teamwork Quality (TWQ) scale. See emails below of the correspondence with M Hoegl and H.G. Gemuenden:

First email to M. Hoegl and H.G.Gemuenden

From: Heila VanWyk
Date: 18.06.2014 10:57 (GMT+00:00)
To: Hans.gemuenden@tim.tu-berlin.de, hoegl@wsu.edu
Subject: Teamwork Quality Survey/Scale

Dear M. Hoegl and H.G. Gemeunden

First I would like to thank you for the article you have written about 'Teamwork Quality and the Success of Innovative Projects: A Theoretical Concept and Empirical Evidence.' I read about the Teamwork Quality Survey (TWQ) in an article 'Measuring teamwork in Healthcare Settings - A review of Survey Instruments.' On page 32 in this article a summary of the TWQ is given. It mentioned a Teamwork scale of 37 items. I am currently writing my proposal for a Master's Degree at the University of Pretoria, South Africa and I would like to know if there is a possibility to use this TWQ scale as part of my Masters? My study is about Interprofessional education programme to develop teamwork among undergraduate healthcare students during

community fieldwork'. It is a multi-method study and I would like to use the TWQ scale to measure teamwork during my pre- and re-evaluation of the interprofessional team in order to determine what the most suitable way would be to educate undergraduate healthcare students to function in a team

Thank you once again!

Regards

Heila van Wyk

University of Pretoria

Occupational Therapy Department

Reply from M Hoegl with regard to first email

-----Ursprüngliche Nachricht-----

Von: Hoegl, Martin [mailto:hoegl@lmu.de]
Gesendet: Mittwoch, 18. Juni 2014 13:44
An: Heila VanWyk; Gemuenden, Hans Georg, Prof. Dr.; hoegl@wsu.edu
Betreff: AW: Teamwork Quality Survey/Scale

Dear Heila van Wyk

Thanks for your interest in our work. Feel free to use the scales and cite our 2001 Organization Science article.

All the best for your research

Martin Hoegl

Reply from H.G.Gemuenden with regard to first email

Hans Georg Prof. Dr. Gemuenden
hans.gemuenden@tim.tu-berlin.de
Thu, Jun 19, 2014 at 7:49 AM
To: heilaw@gmail.com, Martin Hoegl <hoegl@lmu.de>, "hoegl@wsu.edu" <hoegl@wsu.edu>

Dear Heila van Wyk

I agree as well, and also want to thank you for your interest.

Greetings from the project business workshop in Oulu, Finland

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Editor-in-Chief of Project Management Journal

Question from the researcher

From: Heila VanWyk
[mailto:Heila.VanWyk@up.ac.za]

Sent: Thursday, June 19, 2014 7:46 AM
To: Hoegl, Martin
Subject: TWQ survey/scale

Dear M. Hoegl

Thank you for the reply. We have access to most of the journals. I have the article Teamwork Quality and the success of innovative projects.pdf. Table 1 describe the teamwork quality construct with questions. Could I ask these questions to determine the quality of teamwork or is there another scale (Likert scale)? In the 'Measuring teamwork in Healthcare Settings - A review of Survey Instruments.' they mention items in a teamwork scale?

Maybe I am just missing something very obvious.

Regards
Heila van Wyk

Reply from M Hoegl

-----Ursprüngliche Nachricht-----

Von: Hoegl, Martin [mailto:hoegl@lmu.de]
Gesendet: Mittwoch, 19. Juni 2014 09:39
An: Heila VanWyk; Gemuenden, Hans Georg, Prof. Dr.; hoegl@wsu.edu
Betreff: AW: Teamwork Quality Survey/Scale

All the items are included in the appendix of that paper and were assessed by respondents on a 5-point Likert scale ranging from 'completely disagree' to 'completely agree'.

Hope this helps.

Best

M. Hoegl

ANNEXURE C:

Quantitative data generation: Reflective essays for students (phase two)

REFLECTIVE ESSAY (Phase 2)

Date: _____

Encircle the appropriate answers below:

Student from:	Occupational Therapy	Physiotherapy	Speech Therapy		
Your exposure to teamwork in this specific setting:	1 Wednesday	2 Wednesdays	3 Wednesdays	4 Wednesdays	5 Wednesdays
Write down the amount of Wednesdays you have worked with each discipline in this specific setting. E.g. 3 Wednesdays with an OT and 2 Wednesdays with a PT	Occupational Therapy	Physiotherapy		Speech Therapy	

Answer the following questions as comprehensive as possible:

1. Reflect on your **experiences** as a team member in this particular setting and write it down below.

2. Reflect on your **development (academic, social, emotional, personal) over the last few Wednesdays** from being exposed to mainly working individually (or with your own discipline) to working in a team with other disciplines. Please write your answer down below.

3. Anything else that you would like to mention? Please write it down below.

ANNEXURE D:

Quantitative data generation: Reflective essay questions for the clinical supervisor

REFLECTIVE ESSAY (Clinical supervisor)

Date: _____

Answer the following questions as comprehensive as possible:

- 1) From a lecturer/supervisor's point of view **reflect on the teamwork you observed** amongst the students in this particular setting.
- 2) From a lecturer/supervisor's point of view reflect on the students' **development (academic, social, emotional, personal) over the last few Wednesdays** from being exposed to mainly working individually (or with students from their own discipline) to working in a team.
- 3) **From a lecture/supervisor's point of view what is your expectations of teamwork with students from other disciplines in this particular setting**

ANNEXURE E:
Summarised Teamwork Quality Scale

Summarised Teamwork Quality (TWQ) Scale

by M. Hoegl and H.G. Gemuenden (2001)

Summarised by H. van Wyk (2014)

Mark the appropriate column; completely agree, mostly agree, unsure, mostly disagree, completely disagree (each question should only have one column marked):

		Completely agree	Mostly agree	Unsure	Mostly disagree	Completely disagree
1	There was frequent communication within the team					
2	The work done on different subtasks was closely harmonized.					
3	The team recognized and used the specific potentials (strengths and weaknesses) of individual team members					
4	The team members helped and supported each other as best as they could					
5	Every team member fully pushed the objectives of the intervention					
6	It is important to all the members of the team to be part of the intervention					
7	All intervention objectives were achieved					
8	The intervention session was executed as planned					
9	The team members have gained from the teamwork					
10	We have learned from the other members during teamwork					
11	The team members communicated spontaneously.					
12	There were clear and fully comprehended objectives for subtasks within our team					
13	The team members were contributing to the achievement of the team's goals in accordance with their specific potential.					
14	If conflicts came up, they were easily and quickly resolved					
15	The team did not see anything special in the teamwork intervention					
16	The session targets were accepted by all team members					
17	The intervention was of high quality					
18	Team intervention was low cost and effective					
19	The team members would like to do this type of collaborative teamwork again					
20	The teamwork promoted me professionally					
21	The team members communicated mostly directly and personally with each other.					
22	The goal for subtasks were accepted by all team members					

		Completely agree	Mostly agree	Unsure	Mostly disagree	Completely disagree
23	Imbalance of member contribution caused conflicts in our team					
24	Suggestions and contributions of team members were respected					
25	Our team put much effort into the intervention of the child					
26	The intervention was important to the team					
27	The team was satisfied with the with the intervention					
28	Good time management was used during teamwork					
29	The teamwork was experienced as positive					
30	The teamwork promoted me personally					
31	Relevant information was shared openly by all team members					
32	There were conflicting interests in our team regarding objectives/session targets					
33	All members contributed what they could					
34	Our team was able to reach consensus regarding important issues					
35	There were conflicts regarding the effort that team members put into the intervention					
36	All members were fully integrated into our team					
37	Results was obtained with teamwork					
38	Our team used the resources available					
39	We are satisfied with our teamwork					
40	During teamwork I have learned from myself					
41	The team members were happy with the usefulness of the information received from the other team members					
42	All members worked together to achieve the objective/session target					
43	All members explained the reason for their suggested intervention					
44	Suggestions and contributions of team members were discussed and further developed					
45	Every team member made the intervention their highest priority					
46	Our team was sticking together					
47	We had little uncertainty in our group					
48	Our team was well organized					
49	I would like to provide healthcare services in a team					
50	Teamwork was an effective learning opportunity					

ANNEXURE F:

Different team building activities used in the study

Team building activities

Session two:-Get to know your team

- Students were divided in the teams they worked with for the next three contact sessions.
- The team members asked questions to get to know one another.
- Each member in the team had to be introduced to the bigger group but students were not allowed to introduce themselves.

Session three:-Name game

- Words relevant to the setting and profession were written on a sticker.
- Each student received a sticker that was stuck to their forehead.
- In their teams the members had to explain the term without using the word or part of the word written on their forehead.
- As soon as all the members could identify their own word the team was finished

Session four:-

- Students had to stand in one circle
- Students had to move an object around in the circle starting and ending at the same person. The object was not allowed to fall to the ground. Students were not allowed to use their hands to move the object.
- Objects included a stick and a balloon

ANNEXURE G:

**Client form used for the interprofessional
education programme.**

CLIENT FORM

One client planning form should be completed per team (team involve occupational therapy (OT), physiotherapy (PT) and speech therapy (ST) students) as preparation and evaluation of each team effort.

Date: _____

Table 1: Team members:		
Name and surname of the team members	Encircle discipline (OT, PT, ST.) of each members	Encircle the number of times each member has been involved in team work at this centre (specifically in this team)
	OT PT, ST	1, 2, 3, 4, 5, 6, 7
	OT PT, ST	1, 2, 3, 4, 5, 6, 7
	OT PT, ST	1, 2, 3, 4, 5, 6, 7
	OT PT, ST	1, 2, 3, 4, 5, 6, 7
	OT PT, ST	1, 2, 3, 4, 5, 6, 7

***Encircle the team member you have identified as the team facilitator**

Table 2: Intervention of client	
Name and surname of the client	
Age of the client:	
Known diagnosis:	
Encircle intervention:	Assessment, Treatment, Both

Please do not include any names (student or client's names) on this page!!

Client	Write down the objectives for this session?	
	Write down the session targets for this session	
	List the contribution of each of the team members in achieving the common objectives/session targets? Do not include any names!	
	Disciplines	Contribution
	OT	
PT		
ST		

If you have completed until here the intervention session should now be conducted!!

Client	Evaluate the session (objectives, session target, team work, roles etc.)
	Write down the change and planning for the next session

ANNEXURE H:

Quantitative data collection:

Microsoft Office Excel 2010 spread sheet

	Communic		Coordination		Contribution		Mutual support		Effort		Cohesion		Effective		Efficiency		Work satisfaction		Learning
	Comm	Comm	Coordi	Coordi	Contrib	Contrib	Mutual	Mutual	Effort 1	Effort 2	Cohesio	Cohesio	Effective	Effective	Efficient	Efficient	Work sat	Work sat	
1	24	25	24	22	23	23	24	25	20	24	25	24	20	22	24	23	25	25	25
2	23	19	16	19	19	18	17	22	16	18	20	18	16	20	20	21	22	18	21
3	22	15	16	15	15	9	22	10	17	10	21	10	18	10	15	9	22	10	10
4	24	25	18	25	18	25	19	24	17	25	18	25	11	24	16	24	20	25	25
5	15	18	15	20	15	21	16	22	14	20	15	21	15	20	15	20	18	23	22
6	22	23	17	21	21	22	21	21	21	22	23	21	19	19	21.057	19	23	23	24
7	22	20	19	18	20	19	22	20	20	18	20	15	10	15	16	19	19	20	20
8	23	25	20	22	23	23	24	25	23	25	24	25	20	22	21	23	24.568	25	25
9	15	16	14	20	15	17	17	18	15	18	17	20	13	18	14	12	16	21	21
10	23	25	21	23	21	24	23	25	23	23	22	25	18	22	19	24	24	25	25
11	25	25	24	25	24	25	25	24	21	25	25	24	24	23	23	25	25	25	25
12	23	24	18	25	21	21	20	24	22	25	22	25	20	24	20	21	25	24	25
16	22	25	22	25	24	24	24	24	24	24	23	25	22	24	22	25	25	25	25
17	23	21	16	21	20	20	19	22	19	19	21	22	16	22	16	23	19	22	24
18	20	25	22	24	22	25	22	25	22	25	22	25	16	25	20	25	22	25	25
19	25	24	21	24	22	22	19	21	23	22	20	25	22	24	24	24	25	25	24
20	24	21	24	25	23	25	24	25	22	25	23	25	20	21	24	25	25	25	25
21	24	24.62	20	24	22	25	22	25	22	25	22.33	23	20	22	19	22	24	25	25
22	24	25	22	25	21	25	23	25	25	24	24	25	22	25	22	25	24	25	25
Total	401	410.6	353	408	374	404	381	417	369	407	413	324	392	356.06	400	405.57	426	417	431

Participant 3 taken out of the total

ANNEXURE I:
Ethical clearance letter

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 22 May 2002 and Expires 20 Oct 2016.
- IRB 0000 2235 IORG0001752 Approved dd 22/04/2014 and Expires 22/04/2017.



UNIVERSITEIT VAN PRETORIA
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Faculty of Health Sciences Research Ethics Committee

2/10/2014

Approval Certificate
New Application

Ethics Reference No.: 369/2014

Title: Multidisciplinary education programme to develop undergraduate healthcare students as multidisciplinary team members in a community setting in Gauteng

Dear Miss Heïla Van Wyk

The **New Application** as supported by documents specified in your cover letter for your research received on the 29/08/2014, was approved by the Faculty of Health Sciences Research Ethics Committee on the 1/10/2014.

Please note the following about your ethics approval:

- Ethics Approval is valid for 1 year.
- Please remember to use your protocol number (369/2014) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, or monitor the conduct of your research.

Ethics approval is subject to the following:

- The ethics approval is conditional on the receipt of 6 monthly written Progress Reports, and
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers: MChB; MMed (Inf); MPharMed.
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

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ANNEXURE J:
Editor's declaration letter

DECLARATION OF LANGUAGE EDITING



I, Mari Grobler, hereby declare that I have edited the research study with the title:

**Interprofessional education programme to develop teamwork among
undergraduate
healthcare students during community fieldwork**

for **Heila van Wyk** for the purpose of submission as a postgraduate dissertation.

Changes were suggested and implementation was left to the discretion of the author.

Yours sincerely

Mari Grobler

SATI membership no: 1002808