

**A FRAMEWORK FOR SERVICE-LEARNING IN THE
UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE
MANGAUNG AREA**

by

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25 September 2014

PROMOTER:

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DECLARATION

I hereby declare that the work submitted here is a result of my own independent investigation. Where help was sought, it was acknowledged and all the sources I have used or quoted have been indicated and acknowledged as references. I further declare that this work is submitted for the first time at this university/faculty towards a Philosopher Doctor degree in Health Professions Education and that it has never been submitted to any other university / faculty for purpose of obtaining a degree.



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01 October 2014
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DEDICATION

I dedicate this thesis to everyone who recognises the plight of those less fortunate and strives to improve their fellow human being's lives by using their privileged position as educated citizens. The Nelsons, the Walters, the Mahatmas, the Therasas, who despite adversity fights social injustice spurred on by the philosophy of Ubuntu.

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IGZIABEHER!

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LIST OF ACRONYMS

ASLER	:	Alliance for Service Learning in Education Reform
CCFO	:	Critical Cross Field Outcomes
CE	:	Community Engagement
CPUT	:	Cape Peninsula University of Technology
CUT	:	Central University of Technology
ELOs	:	Exit-level Outcomes
FSDoH	:	Free State Department of Health
HPCSA	:	Health Professions Council of South Africa
IQ	:	Intelligence Quotient
ISETL	:	International Society for Exploring Teaching and Learning
JET	:	Joint Education Trust
NGO	:	Non-governmental Organisations
NQF	:	National Qualifications Framework
NRF	:	National Research Foundation
OBE	:	Outcomes-based education
PBL	:	Problem-based Education
RED	:	Radiography Education Discussion group
SA	:	South Africa
SAAHE	:	South African Association of Health Educationalists
SAHECEF	:	South African Higher Education Community Engagement Forum
SAQA	:	South African Qualifications Framework
SASCE	:	Southern African Society for Cooperative Education
SL	:	Service-Learning
STEPS	:	Strategic Transformation of Programmes and Structures
TUT	:	Tshwane University of Technology
UFS	:	University of the Free State
UJ	:	University of Johannesburg
WIL	:	Work-Integrated Learning

SUMMARY

Key terms: Service-Learning (SL); benefits; personal growth; reciprocity; critical thinking; Mixed-methods research design; framework for SL; Radiography.

In this research project, an in-depth study was done by the researcher with a view to compiling a framework for Service-Learning (SL) in the undergraduate Radiography programme in the Mangaung area.

SL is “a credit-bearing educational experience in which students participate in an organised service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content” (Bringle & Hatcher 1995: 212). Currently no framework for SL in resource-based disciplines such as Radiography exists in South Africa. The objectives of the study were

- To establish whether the community benefits from Radiography SL;
- To establish whether SL cultivates social responsiveness in students;
- To investigate the effectiveness of SL in enabling students to achieve the generic skills;
- To establish specifically whether SL cultivates critical thinking in students; and
- To analyse whether reciprocity is achievable when doing SL in Radiography.

A mixed method research approach was used to gather data consisting of both qualitative and quantitative data. Third-year Radiography students prepared and executed dramatised presentations, and Grade 12 learners, contact persons at the five schools involved and the Radiography facilitator evaluated the presentations using different rubrics. The Radiography students completed a structured reflection adapted from Zlotkowski *et al.* (2005) and the Watson-Glaser Critical Thinking Appraisal tool. Radiography academics participated in a semi-structured interview during the study. Data was also gathered from delegates at the 42th ISELT conference. The data sets were merged, connected and embedded to facilitate triangulated discussion and conclusions.

Grade 12 learners, contact persons and academics who participated (42nd ISELT conference UJ, TUT and CPUT) indicated that communities benefitted from the SL intervention. From students' reflective comments it can be concluded that students became more socially responsive. This conclusion was confirmed by the academics who participated. From feedback by Grade 12 learners and contact persons and other academics involved, it can be concluded that SL enables students to attain generic attribute skills. The collective results of the Watson-Glaser Critical Thinking Appraisal tool of the third visit increased from the second visit. Facilitators from the ISELT conference, UJ, TUT and CPUT confirmed that SL assists in developing critical thinking skills in students. Academic reciprocity was made possible by incorporation of additional sources of information, through doing research and by having a practical approach to simplifying information.

From the conclusions it is clear that SL activities benefit students and communities. The general approach to structuring the framework allows other academic fields to make use of this framework. The framework has an action-research format: activities and goals of the intervention are reflected on constantly.

OPSOMMING

Belangrike terme: Diensleer; voordele; persoonlike groei; akademiese wederkerigheid; kritiese denke; gemengde-metode navorsingsontwerp; raamwerk vir diensleer; Radiografie.

Die navorser het tydens hierdie projek 'n in-diepte studie uitgevoer met die oog daarop om 'n raamwerk saam te stel vir diensleer in die Voorgraadse Radiografieprogram in die Mangaung area.

Diensleer is 'n geakkrediteerde opvoedkundige ervaring waaraan studente tydens 'n georganiseerde diensaktiwiteit deelneem, wat vooraf bepaalde gemeenskapsbehoefte aanspreek en wat vereis dat hulle oor die diensaktiwiteit dink ten einde 'n dieper begrip van die vakkennis te bekom (Bringle & Hatcher 1996: 222). Tans bestaan daar geen raamwerk in Suid-Afrika vir diensleer in hulpbrongebaseerde dissiplines soos Radiografie nie. Die doelwitte van die studie was:

- Om vas te stel of gemeenskappe baat by Radiografie diensleer;
- Om vas te stel of diensleer sosiale verantwoordelikheid by studente kweek;
- Om te bepaal hoe effektief diensleer is om generiese bekwaamhede by studente te ontwikkel;
- Om spesifiek vas te stel of diensleer kritiese denke by studente kweek; en
- Om te analiseer of wederkerigheid moontlik is wanneer diensleer in Radiografie verrig word.

'n Gemengde-metode navorsingsontwerp is gebruik om kwalitatiewe en kwantitatiewe data te versamel. Derdejaar-Radiografiestudente het gedramatiseerde voorleggings voorberei en uitgevoer, en Graad 12-leerlinge, kontakpersone by die vyf skole betrokke en die Radiografiefasiliteerder het die voorleggings met behulp van verskillende rubriks geëvalueer. Die Radiografiestudente het 'n gestruktureerde refleksie, gebaseer op Zlotkowski *et al.* (2005) en die Watson-Glaser Critical Thinking Appraisal Tool, voltooi. Radiografie-akademics het gedurende die studie aan 'n semigestruktureerde onderhoud deelgeneem. Data is ook versamel van afgevaardigdes by die 42^{ste} ISELT konferensie.

Hierdie datastelle is saamgevoeg, verbind en ingebou om triangulasie van bespreking en gevolgtrekkings moontlik te maak.

Graad 12-leerlinge, kontakpersone en akademici wat deelgeneem het (42^{ste} ISELT konferensie, UJ, TUT en KPUT), het aangedui dat gemeenskappe baat by diensleer-intervensies. Van student se reflektiewe kommentaar kan afgelei word dat studente meer sosiaal verantwoordelik geword het. Hierdie gevolgtrekking is bevestig deur die akademici wat deelgeneem het. Uit terugvoer deur Graad 12-leerlinge, kontakpersone en akademici wat deelgeneem het, kan dit afgelei word dat diensleer studente in staat stel om generiese bekwaamhede te ontwikkel. Die saamgestelde resultate van die Watson-Glaser Critical Thinking Appraisal Tool van die derde besoek het toegeneem vanaf die tweede besoek. Fasiliteerders van die 42^{ste} ISELT konferensie, UJ, TUT en KPUT het bevestig dat diensleer studente help om vaardighede wat met kritiese denke verband hou, te kweek. Akademiese wederkerigheid is moontlik gemaak deur addisionele bronne van inligting in te sluit, deur navorsing te doen en deur 'n praktiese benadering tot die vereenvoudiging van inligting te volg.

Uit die gevolgtrekkings is dit duidelik dat diensleeraktiwiteite voordelig is vir studente en die gemeenskap. Die algemene benadering wat gevolg is om die raamwerk te struktureer beteken ander akademiese velde kan ook die raamwerk gebruik. Die raamwerk volg 'n aksienavorsingsbenadering: daar word voortdurend op aktiwiteite en doelwitte van die intervensie gereflekteer.

A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Before hieroglyphics, before papyrus, before pedagogy, before the Bachelors and before the Internet, experience and word of mouth were the tools of information dissemination and formal education.

The subsequent elitisation of tertiary education was in direct contrast to the origin of education—and in relation to teaching and learning methodologies such as service-learning (SL), it is true that *pedagogical regression* is directly proportional to societal progression. Societal progression through service provision and access to resources in South Africa poses great challenges. Reasons for this are the geographical spread of and demographic, socio-economic and educational differences among members of the South African population. The mandate of an institution of higher learning is highly integrated with the development and requirements of society at large. Remedial action through SL by institutions of higher learning is not only a governmental proclamation, but also warranted by our common humanity.

What is good teaching? It is a known fact that learners' abilities and background, and their different expectations and commitment, influence the way that they respond to current teaching methods (Biggs 2003:2). Facilitation should also cater for the level of sophistication of today's learners through innovative and creative learning experiences. What is good teaching? Learning experiences should articulate with the cognitive level required for the specific module. When writing outcomes, learning designers should use specific verbs to derive target activities for constructive student engagement through SL activities. Maybe the answer of what good teaching is lies in the process of adding value to learning material, to finally manifest in a sort of automotive intelligence in students that adapts theory to the environment and thus shapes the environment.

When answering the question of one of the top learners in his class, "What is the correct answer?". Patterson (1988:Personal communiqué) said: "Any of the discussed answers, you may use as the correct answer." This profound statement referred to a teaching process that allowed learners to engage with the learning material at a deeper level and thus create their own knowledge that related to the learning material.

Patterson (1988:Personal communiqué) serves as a guide to answer the question of what good teaching is through him cultivating individuals who have a sense of belonging, a knowingness, an inquisitiveness, an emancipated spirit that is not confined to the covers of a textbook. Good teaching takes place when you allow your four-year-old child to play around with Ms Paint. It is by allowing students to feel the texture of the mud forced through their fingers when they make mud cakes, in doing so making sense of the environment and reshaping it.

This research study involved an in-depth study by the researcher with a view of using an evaluation of the efficiency of SL as a learning facilitation method to develop a philosophy and methodology for SL in Radiography. This study can serve as a directive for developing SL experiences not only for Radiography, but also for other undergraduate, resource-based, paramedical disciplines doing SL. The relevance of the study is emphasised by the South African Department of Education (DoE) declaration that community service activities like SL should be integrated with learning, teaching and research (RSA DoE 1997).

The aim of this first chapter is to orientate the reader to the study. It provides the background and context to the research problem. This information is followed by the problem statement and research questions, the overall goal, aim and objectives of the study, demarcation and the scope of the study, research design and methods. Chapter 1 includes the envisioned implementation of the findings, and the outline of the subsequent chapters in the thesis. Chapter 1 is concluded with an overview of the chapter content as well as a preview of Chapter 2.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

The aim of the background section is to sketch the current higher-education landscape of South Africa (SA) and to give a broad overview of teaching and learning practices. The background section also investigates similar studies in relation to design, inter-project

relationships and findings. The growth of community-based interventions by tertiary institutions in SA is a response to the country's socio-economic legacy of inequality and has primarily been driven by government through a variety of interventions, which are discussed in Section 1.2.1.

1.2.1 Service-learning and higher education

White Paper 3 (RSA DoE 1997) changed the three-silo arrangement of tertiary education, that of teaching and learning, research and community service. The concept of community service now infuses and enriches the other two functions of tertiary education with a sense of context, relevance and application. There has been a change in the terminology used by the DoE and the Higher Education Quality Committee (HEQC), from "community service" (RSA DoE 1997) and "academically based community service" (HEQC 2001) to "community engagement", which includes SL (HEQC 2004a; 2004b; 2004c). The term "scholarship of engagement" has been in use since 2006 (HEQC JET 2006). By examining the above nomenclature, it becomes evident that the words indicate a shift in thinking about the way academic institutions interact with communities. Community Higher Education Service Partnerships (CHESP) contextualise at least three reasons why this has happened. First, there is a renewed interest in the re-insertion of the public good of tertiary education into reformative discussions. Thus, *pedagogical regression* leads to societal progression through the re-evaluation of the definition of the public good—perhaps through a "social contract" (Bawa 2003:53).

Second, there has been an increase in knowledge production, dissemination and integration of knowledge into the solution of problems over the past decades. Castells (in Bawa 2003:53) describes knowledge as the electricity of the new industrial revolution. In specialised, resource-based disciplines like Radiography this flow of knowledge from the community may not be subject specific. The pilot study of this research project, though, suggests advantages of active student participation, such as collaborative learning and knowledge enhancement, through students having to simplify information during the presentations.

Third, the explosive growth of information technology (IT) has opened new forms of knowledge flows. Depending on the community partnered with IT, SL facilitates better communication with the community (electronic mail and Short Message Service). IT can be used during the intervention and also to evaluate the intervention. The Radiography

student cohort is diverse and come from diverse backgrounds, and consequently not all students have had the same advantages. The Radiography SL project aims to narrow this chasm by having students participate in information gathering, information processing and dissemination. Students thus have to use the internet, create visually aided presentations and use IT hardware to facilitate the dissemination of information.

On the basis of these three reasons a new conceptualisation of community-based learning is founded. As a teaching methodology SL is aligned with the previously mentioned reasons as long as SL is conceptualised in the context of reciprocity between the students and the community. In a very real sense, this is an opportunity to reflect on the nature of the "pluroversity" (Goddard 2011:Presentation), which will be discussed in Section 1.2.2.

1.2.2 From University to "Pluroversity"

The word university refers to a singularity, dependent on itself and not influenced by other extrinsic variables. In this lies the problem. During the proceedings of the Community Engagement Conference of 2011, co-hosted by the South African Higher Education Community Engagement Forum (SAHECEF) the idea of the "pluroversity" was raised. The term is affiliated with the concept of the "civic university", which can be described the city as a living laboratory. Goddard suggests that the idea of the "pluroversity" is supported by survey and case-study evidence (Goddard 2011:Presentation). "Pluroversity" indicates a plurality, dependent on and influenced by other extrinsic variables. This concept takes into account the role that higher education plays in developing broad-based, national intellectual cultures, fostering good citizenship, and ensuring the vibrancy of national cultures. In the case of the "pluroversity", community needs, well-being and proliferation are the main extrinsic factors that assist the academic institution to define and refine its relevance (Goddard 2011:Presentation).

1.2.3 Teaching and learning at the Central University of Technology

Principles of teaching and learning at the Central University of Technology (CUT) relate to the creation of a learner-centred environment that will facilitate critical thinking and problem-solving through the integration of academic abilities and activities to create gregarious, lifelong learning. Another value of the CUT is that learners should be allowed to integrate transferable skills into the mainstream curriculum (CUT 2004:5).

The implementation of outcomes-based education (OBE) principles at the CUT has created fertile ground for the establishment of graduate attributes derived from the graduate outcomes prescribed by the South African Qualifications Framework (SAQA) (CUT 2004:9). Radiography is a very practical, resource-based field of study that requires learners to demonstrate graduate skills such as communication, teamwork, working effectively with science and technology, and problem solving. This specific way of handling the medical environment on a daily basis is cultivated through clinical exposure, Work-Integrated Learning (WIL), community engagement (at the CUT, community engagement includes SL) outcomes, and assessment strategies. Through working with diverse populations through community engagement activities such as SL, students are given an opportunity to develop skills relating to cultural sensitivity, relativity, and tolerance, thus encouraging a transformation in their thinking.

1.2.4 Service vs. learning

Sigmon (1996:9) explains four perspectives that can shape the SL experience. There can be an emphasis on service, on learning, or on both, together or separately. When the emphasis is placed on service only, service becomes the primary focus of the experience and learning is secondary, written as SERVICE-learning. Conversely, when the focus is on learning and service is secondary, Sigmon (1996:9) reports that the pedagogy is written as service-LEARNING. There are also those who favour the stance that each is separate but important; therefore, they depict the pedagogy as service learning, clearly omitting the hyphen. Lastly, Sigmon explains that when both service and learning are emphasised equally and the words are combined with the hyphen, reciprocity is at play for all partners in the experience and the pedagogy is written as SERVICE-LEARNING.

Jacoby (1996:4) points out that the use of the hyphen in the term service-learning is a representation of the symbiotic relationship that exists between service and learning. This symbiotic relationship is an important distinguishing marker of SL that is uniquely tied to reciprocity. Without the symbiotic relationship, reciprocity cannot occur. One of the greatest challenges of integrating SL into the curriculum is to show that this pedagogy allows community experiences to enrich the educational experience. This is especially true in specialised disciplines like Radiography, where reciprocity needs to be redefined.

1.3 PROBLEM STATEMENT AND RESEARCH QUESTIONS

The importance of reflection on and evaluation of teaching practices is related to discrediting the perception that SL is a mere “add-on”. In light of this argument, it can be asked whether Radiography undergraduate SL serves its intended academic and societal purpose. No recent (or any) study concerning SL in Radiography could be traced as far as the Nexus database (cf. 2.1) is concerned.

In order to address the problem stated, the following research questions were addressed:

1. Do communities benefit from Radiography SL?
2. Does Radiography SL promote citizenship by cultivating social responsiveness in students?
3. Does planning, preparation and interaction with the community through SL enable students to achieve graduate attributes?
4. Does Radiography SL enhance learning through reciprocity?

Radiography SL has become a reality through the intervention of the government bodies, and the efforts of tertiary institutions. Feedback from the Radiography Education Discussion (RED) group in 2011 indicates that only three of the seven South African higher-education institutions offering Radiography are engaged in SL. It is thus imperative that a methodology and philosophy for SL in Radiography be developed to thereby enable the other institutions not currently engaged with communities through SL, to do so.

1.4 OVERALL GOAL, AIM AND OBJECTIVES OF THE STUDY

1.4.1 Overall goal of the study

The overall goal of the study is to develop a philosophy and methodology for SL in Radiography. Through different national interventions, a philosophy and methodology for Radiography WIL was developed. Similarly, a common understanding and pathway is needed for Radiography SL. This is underpinned by the fact that it is challenging to do SL in resource-based disciplines like Radiography, and consequently only a few institutions offering Radiography are involved in SL. The philosophy and methodology were developed from information gathered through the objectives analysis facilitated by a variety of research tools.

1.4.2 Aim of the study

The aim of this study was to developing a framework for SL in the undergraduate Radiography programme in the Mungaung area. By doing this an evaluation of the efficiency of SL as a learning-facilitation method is used to develop a philosophy and methodology for SL in Radiography. Doing all these “new” things raises many questions, and the most troublesome one seems to be whether SL is achieving the promised rewards of overall beneficitation. Is SL just another add-on, or is it the protruding, blood-drenched dagger engineered to lead to the licking wolf’s demise?

The aim can be further unpacked under the headings of beneficitation related to students and communities, whether SL informs the academe, and whether it is still SL even though not all the classic criteria characterising academic community engagement are satisfied.

1.4.3 Objectives of the study

To achieve the aim, the following objectives were pursued:

1. To establish whether the community benefits from Radiography SL.
This objective addresses research question 1.
2. To establish whether SL cultivates social responsiveness in students.
This objective addresses research question 2.
3. To investigate the effectiveness of SL in allowing students to achieve graduate attributes.
This objective addresses research question 3.
4. To establish whether SL cultivates critical thinking in students.
This objective is a subcategory of graduate attributes and addresses research question 3.
5. To analyse whether reciprocity is achievable when doing SL in Radiography.
This objective addresses research question 4.
6. To compare the significance and correlation between the datasets of the different years using a 95% confidence interval.
This objective validates research questions 1, 2, 3 and 4.

1.5 DEMARCATION OF THE FIELD AND SCOPE OF THE STUDY

The findings of the study may be applied in health professions education, and specifically in Radiography programmes. Melville and Goddard (2001:12-16) note that proper demarcation of the research problem and a well-defined scope and boundaries are important for providing focus and direction to any proposed research activity. In relation to the overall goal of the study, the findings will lay the foundation for the development of a methodology and philosophy for SL in Radiography.

As mentioned previously (cf. 1.3), from the RED group meetings it was clear that only a few institutions are engaged in Radiography SL. It was also evident that there exists a great deal of apprehension about SL and that Radiography academics in SA do not have a clear or common understanding of SL. A framework for undergraduate Radiography SL may not only lead to a common understanding of SL among Radiography academics but may assist in creating responsive, purposeful, effective and mutually beneficial community-based teaching and learning activities.

Through the literature review it became clear that very few paramedical studies have been done on the effectiveness of SL as a teaching and learning method and in relation to Radiography, no studies on undergraduate SL in Radiography in SA were found. More specifically, in resource-based disciplines, issues of critical thinking and reciprocity seem to be landmine fields. If community-based interaction is structured to cater for the aforementioned experiences, health-care workers will gain essential skills and, in addition, it would give credence to the evolution of the "pluroversity" (Goddard 2011:Presentation). To facilitate validity, reliability and trustworthiness (cf. Section 3.7) in relation to the methodology followed as well as the results, a variety of participants were involved in this study. Grade 12 learners at five purposefully selected schools in the Mangaung area and contact persons (teachers) at the different schools completed a structured rubric. Third-year Radiography students participated in a structured reflection and had to complete the Watson-Glaser Critical Thinking Appraisal tool (Watson & Glaser 2002:1-13). Semi-structured interviews were conducted with lecturers at institutions involved in Radiography SL in SA. The processes of data gathering, data analysis and reporting happened continuously during the time period 2012-2013.

1.5.1 The researcher

The researcher in this study is a qualified radiographer (also known as an imaging technologist) registered with the Health Professions Council of South Africa (HPCSA). He is currently a lecturer in the Radiography programme, Faculty of Health and Environmental Sciences, at the CUT in Bloemfontein, SA. The researcher was a member of the institutional Community Engagement Committee and chairperson of the aforementioned faculty's CE committee from 2010-2012 and the CUT.

When Radiography SL started at the CUT, the course content had to be developed from scratch; SL was a foreign concept and no SL guidelines existed at the CUT. Keeping the characteristics of SL in mind, all study material and assessment tools were created by the researcher and, subsequently, he also had to facilitate workshops on SL.

Since first engaging with SL, the researcher has completed a module in SL and has presented a paper at the 2nd National South African Association of Health Educationalists (SAAHE) conference, which took place in Cape Town in 2009. An extended abstract of the presentation was published in the first issue of the *African Journal of Health Professions Education* (AJHPE) (Botha 2009:19). In 2009, the researcher received the Vice Chancellor's Advanced Teaching Award of the CUT. In 2014 an extended abstract of the presentation: Developing critical thinking skills through Radiography service learning at the 5th SAAHE conference of 2013 was published in the AJHPE (Botha, Bezuidenhout & Nel 2014:91).

Initially the researcher did smaller research projects on the experiences of students participating in SL. These projects and more formal developmental sessions not only triggered the researcher's interest in SL, but also were a source of introspection and debate. For the researcher it was important to acquire an improved understanding of SL methodology and philosophy, the teaching and learning theories and strategies used during SL, how SL can be used to benefit all parties involved, its implementation and evaluation as well as current issues and pitfalls associated with SL. Not only would the aforementioned lead to improved personal practice but it would also prove the merit of SL a teaching and learning method.

1.6 SIGNIFICANCE AND VALUE OF THE STUDY

SL activities are designed to benefit students, communities and service providers. Viewing the overall goal of the study as discussed in Section 1.4, it becomes clear that a philosophy and methodology for SL in Radiography has a wider academic impact.

SL activities are designed to assist students to be socially responsive, to have a deeper understanding of the learning material and to develop new skills (cf. section 2.7). Through SL, community needs are addressed and consequently community health is improved. The results of the study indicated the degree to which this happens. Improving community health was achieved by creating an informed community; a community that is aware of available services in general and of medical imaging and associated benefits in particular. Since communities are able to access the services of the Free State Department of Health (FSDoH), the Department's mandate to improve community access and health is also fulfilled. Developing a philosophy and methodology for SL in resource-based disciplines like Radiography may assist with the planning, implementation and evaluation of meaningful academic engagement.

1.7 RESEARCH DESIGN AND METHODS

1.7.1 Design of the study

The mixed method design used in this study is described in more detail in Chapter 3. This study included components of both quantitative and qualitative designs. The overall goal of this study can only be achieved through the combination of these datasets rather than by either approach alone. A mixed approach will provide a better understanding of the philosophy and methodology of Radiography SL. Quantitative and qualitative data will be merged, combined and embedded (Creswell & Plano Clark 2006:7) and the manner of applying, and the depth to which the study used this approach, will be further unpacked in the research design and methodology chapter, Chapter 3.

1.7.2 Methods of the investigation and flow of the study

The study commenced with a search for information related to SL. From the information gathered and personal experience, gaps in the way SL is conducted in resource-based disciplines were identified. The literature searches also assisted in the development of

the research tools. Empirical data was collected from the rubrics of Grade 12 learners and the contact person with the aim of addressing objectives related to beneficiation and the development of graduate skills. A closer look at the development of critical-thinking skills, specifically, was made possible by using the Watson-Glaser Critical Thinking Appraisal tool. The open-ended questions of the Radiography students' reflections and the information from a semi-structured interview with Radiography facilitators provided qualitative information related to the wider impact of SL, including personal growth and academic reciprocity. Trends were categorised and views were transcribed, analysed and interpreted.

A more detailed description of the population, sampling methods, data collection and techniques, data analysis, reporting and ethical considerations is provided in Chapter 3. The schematic overview of the study presented in Figure 1.1 outlines the research activities including assessments and data analysis spread over two years (2012 and 2013).

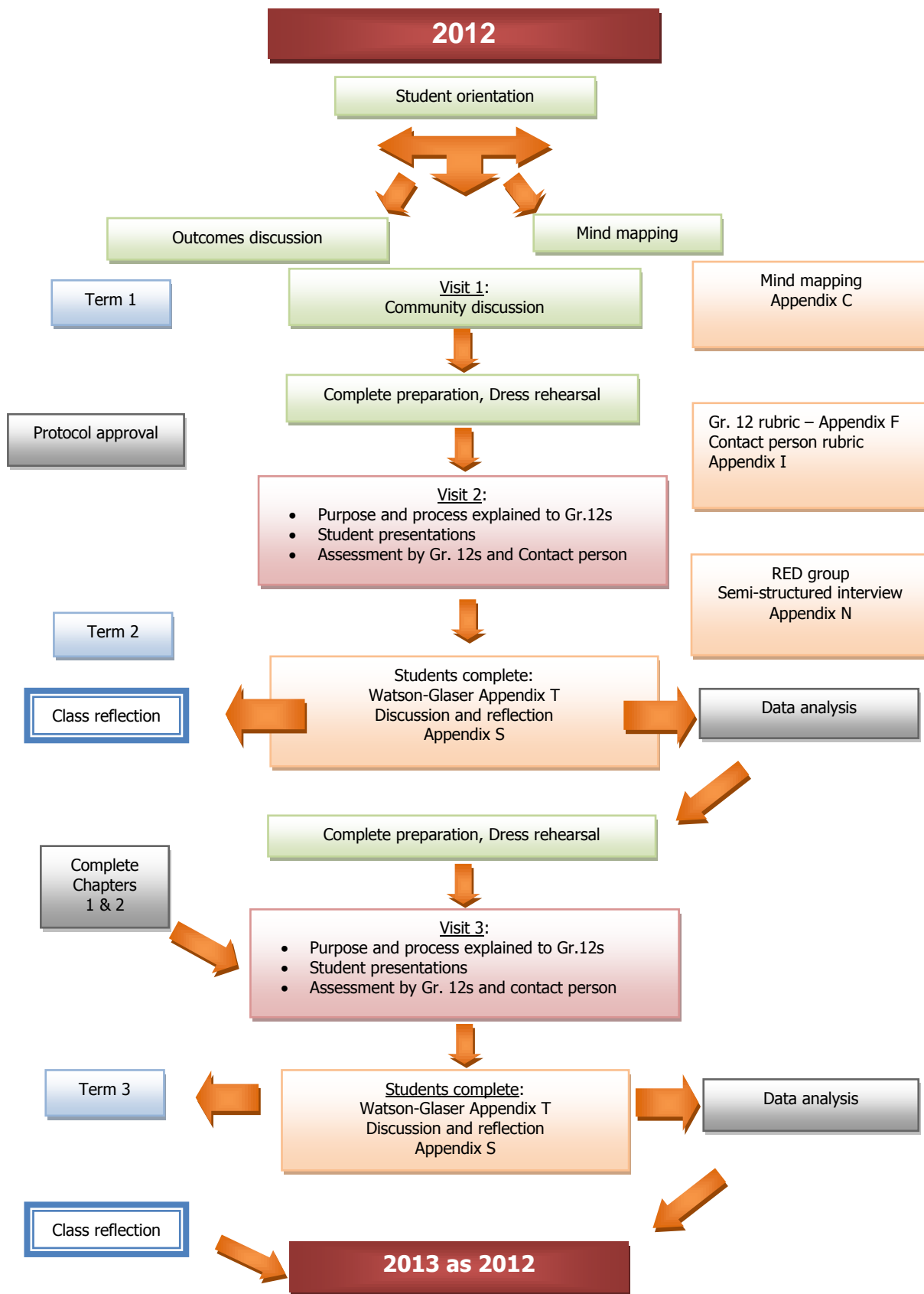


FIGURE 1.1: SCHEMATIC OVERVIEW OF THE STUDY (Compiled by the researcher, Botha 2012)

1.8 IMPLEMENTATION OF THE FINDINGS

The findings of this research and the framework developed from these findings will serve as a reference guide to the what, why and how of SL. This is particularly true for Radiography, but also has applications in the wider field of paramedical disciplines. The implementation of strategies suggested in the framework will be achieved through interventions with the RED group, presentations at workshops, seminars and conferences.

In addition, articles based on the research findings may be submitted to academic journals for publication.

1.9 ARRANGEMENT OF THE REPORT

To provide insight into the topic, the following section provides a brief outline of how the study will be reported, namely,

Chapter 1: Orientation to the study

This chapter presents the background to the research problem. It refers to the problem statement and research questions, the overall goal, aim and objectives of the study. The demarcation and the scope of the study, its research design and methods are briefly alluded to. Chapter 1 includes the outline of the subsequent chapters and the thesis, and it ends with a summary of the chapter.

Chapters 2: Pedagogical regression

This chapter provides the theoretical framework within which the research was conducted. It sketches the current higher-education landscape of SA and gives a broad overview of the teaching and learning practices. This is followed by a more zoned and specific discussion on the conceptualisation of SL, its characteristics, its intended benefits and use in Radiography. This chapter also differentiates between SL and WIL, and it investigates studies with similar objectives in relation to design and findings and presents different viewpoints on methodologies and philosophies of SL.

Chapter 3: Research design and methodology

This chapter describes the research design and methods used to address the objectives of the study. The different research tools and data collection methods are discussed. Chapter 3 gives a detailed explanation of the target population, the specific sample as

well as the sample sizes used during the study. In some instances the research tools were piloted and this chapter provides background and some findings thereof. Issues of validity, reliability and trustworthiness are framed, as are ethical considerations, including consent, associated with the study. The method of data analysis is described.

Chapter 4: Postulate to praxis I: Quantitative results

In Chapter 4 the quantitative research findings of the different tools used during the study are presented. To facilitate easy reading, this chapter includes analysis, interpretation and discussion of the quantitative results of the different tools presented. The chapter is arranged to, first, present the information of the Grade 12 learners—the contact persons—and Radiography facilitator rubrics, including the Radiography students' critical thinking rubrics completed as part of Visit 2 (2012–2013). Second, the same data for the same period for Visit 3 is presented. Third, the feedback from the delegates attending the 42nd International Society for Exploring Teaching and Learning (ISETL) conference in San Antonio, Texas, in 2012, will assist to ensure congruence and thus trustworthiness of facilitator experiences.

Chapter 5: Postulate to praxis II: Qualitative results

The qualitative research results of the different tools are presented. Like the previous chapter, this chapter includes analysis, interpretation and discussion of the qualitative results of the different tools presented. The chapter is thus also arranged to present the qualitative information of the Grade 12 and contact person rubrics. It also includes the Radiography students' structured reflection completed as part of Visit 2 (2012–2013). The chapter includes the same data for the same period of Visit 3, as well as the feedback from reflection discussions of Radiography students. The feedback gathered from the interviews with Radiography facilitators of other South African institutions is then presented—here the previously mentioned congruence of facilitator experiences is demonstrated.

Chapter 6: Pluroversitism: A framework for service-learning

This chapter defines SL in the Radiography context and in doing so differentiates between Radiography SL and Radiography WIL. It provides guidelines for SL planning, SL implementation, SL engagement, assessment of SL and reflection on SL. Management and issues of quality control associated with SL are discussed, including identifying possible hindrances to effective SL in Radiography. The aforementioned revelations are

made possible through an integrated discussion of the study findings and are elaborated on in Section 3.2.1: Quantitative and qualitative data combination.

Chapter 7: Oribus Onum: Conclusions, limitations and recommendations of the study

This chapter elaborates on the conclusions, limitations and recommendations of the study. The conclusion reached from the results is arranged in relation to the objectives of the study. The limitations and recommendations of the study generally relate to all aspects and, more specifically, to the practicalities associated with performing further research in the area of SL.

References:

References will be arranged according to the adapted Harvard referencing method.

Appendices:

All official research documentation as well as all research-related material, such as research tools, consent forms and research information sheets will be presented in this chapter.

1.10 CONCLUSION

This first chapter provides an orientation to the study that is entitled: *A Framework for Service-Learning in the Undergraduate Radiography Programme in the Mangaung area*. It addresses the background to the problem, problem statement and research questions briefly and states the overall goal, aim and objectives of the study. The chapter briefly introduces the research design and research methods, and the significance and implementation of the findings. The chapter concludes by providing an outline of the thesis and the chapters to follow.

In Chapter 2 the theoretical orientation of and support for the study are discussed. Through the investigation, analysis and critical comparison of similar SL studies, the study will be positioned.

CHAPTER 2

PEDAGOGICAL REGRESSION

2.1 INTRODUCTION

In this study *pedagogical regression* refers to taking teaching and learning back to its origins of word-of-mouth through community interaction. Chapter 1 sets out the overall goal and objectives of the study, and provided a glimpse of the methodology and the scientific grounding of the research, which can only be achieved by a thorough review of available research. The researcher completed a search for applicable, current and completed research on SL in Radiography by reviewing both written work, such as textbooks and journals, and electronic databases like Ebscohost®, Science Direct® and PubMed®. No similar studies in the field of Radiography were found, but similar studies in other paramedical fields did emerge.

In this chapter, the notion of pedagogical regression through community engagement and the holistic “pluroversity” approach will be discussed. The regulatory positioning of Radiography, teaching and learning practices used during SL and the general characteristics and benefits of SL will be presented. Radiography WIL will be discussed briefly, enabling the reader to identify similar characteristics and benefits associated with SL and WIL. This discussion also emphasises the differences between SL and WIL; and illustrates that these two teaching and learning methods are not mutually exclusive in Radiography.

Importantly, Chapter 2 demonstrates not only the legitimacy of the research methodology, but also analyses and interrogates the findings of current and previously completed SL research. Chapter 2 will furthermore provide the literature foundation to develop a methodology and philosophy for SL in Radiography; the findings of this study can be regarded as the pillars thereof.

2.2 SCHEMATIC OVERVIEW OF THE CHAPTER

The schematic overview of the chapter presented in Figure 2.1 serves to give the reader a synopsis of the chapter.

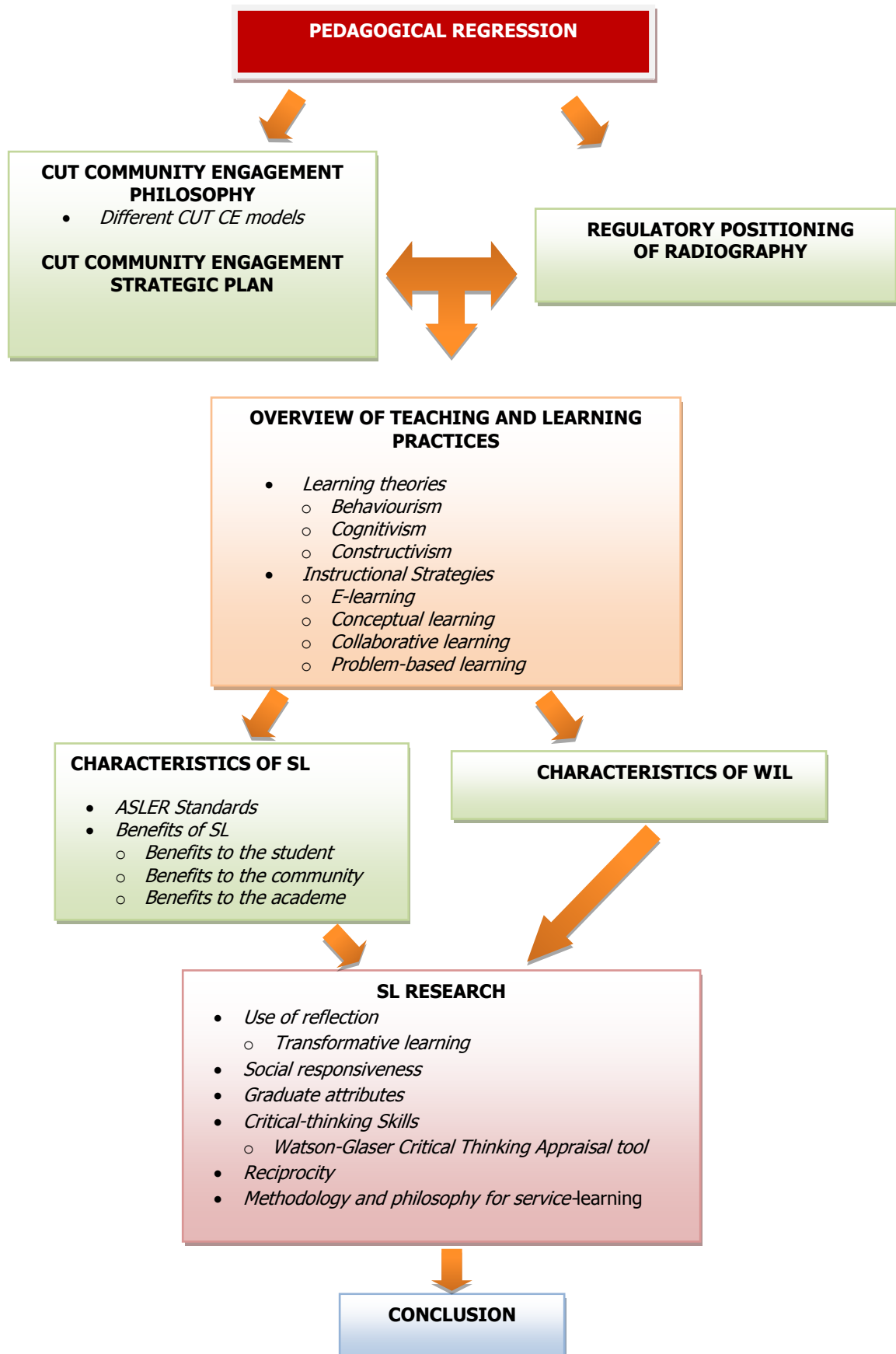


FIGURE 2.1: SCHEMATIC OVERVIEW OF CHAPTER 2
(Compiled by the researcher, Botha 2013)

2.3 PEDAGOGICAL REGRESSION

Modern education is in a state of permanent flux, constantly endeavouring to improve teaching and learning. The purpose of education is to open students' eyes and to create a hunger for learning; this is achieved by adjusting teaching methods and using resources and study material so that it has a broad social impact. The problem with the teaching landscape is that concepts are handled individually and learners are not making the connections. This implies that teachers must sometimes utilise all available resources to go beyond the prescribed textbook, and present the material in an inspiring manner, at a level that makes it possible for learners to be engaged and to comprehend.

The aforementioned situation is further compounded by the three challenges facing higher-education institutions in the 21st century. The first is the rate at which new knowledge is produced; the second is the increasing rate at which knowledge and information are infused into production and service-industry processes; and the third is the increased diffusion of knowledge generation and knowledge dissemination into society, and its reciprocal effect on academe (HEQC CHE 2006).

At a national level, community engagement was identified in White Paper 3 (RSA DoE 1997) as a strategy for transforming higher education, and as a strategy to enable higher-education institutions to demonstrate their social commitment and their sense of social responsibility (HEQC JET 2007). The HEQC has included community engagement in its audit and accreditation requirements, compelling institutions to review their approach to and practices of community engagement. Community engagement has to be embedded into the different functions of universities. To this end, a review of the current situation in terms of social positioning of institutions by means of a needs analysis should be the first step towards holistic infusion of community engagement. Consultation with community partners and other stakeholders, revisiting current offerings, both undergraduate and postgraduate, and setting objectives and outcomes, are important strategies. In this regard the CUT has, amongst other activities, embarked on a Strategic Transformation of Programmes and Structures (STEPS) process of reviewing, planning and designing new interfaculty qualifications, with the prime objective being better orientation to regional and community needs.

The Joint Education Trust facilitated a national CHESP project aimed at "the reconstruction and development of South African civil society through the development of

socially accountable models for higher education, research, community service and development” (JET 1999:2). Six SA tertiary institutions participated in the project. The project’s aim was to achieve this through “the development of partnerships between developing communities, higher education institutions and the service sector” (JET 1999:2). The service sector can include government, not-for-profit, and public service and non-governmental organisations. In this research study the partnership was between the CUT Radiography programme, Grade 12 learners and the Free State Department of Health (FSDoH). Partnerships operate on three different yet integrated levels, the first of which relates to the initial CHESP project:

1. The macro level: The level of the national project (all six universities) and the national DoE and its policies;
2. The meso level: The level of individual campuses—at the CUT this is governed by the institutional community engagement (CE) philosophy and strategic plan (discussed in Section 2.4); and
3. The micro level: The level of the individual academic module (Radiation Science III (SWD30AT) modules) and its community (Grade 12 learners at five different schools) and service partners (FSDoH).

This rethinking of CE differs from the three roles or pillars of a university, namely, teaching and learning, research, and CE. CE is pursued relatively independently from the other two; it is generally confined to community outreach and volunteerism (silo model). Some institutions have varying degrees of intersection between the three roles, and where there is intersection (intersection model), innovative strategies like SL are the primary drivers, and community outreach and volunteerism continue as separate activities. In the cross-cutting model, the university has two fundamental roles, namely, teaching and learning, and research, and in this case CE is defined as a fundamental idea and perspective that must inform and be integrated with teaching/learning and research activities (HEQC JET 2007). At the CUT there exists little diffusion between the three roles. It can be argued that the “pluroversity” (cf. Section 1.2.2) involves the merger of the three pillars, where community engagement encapsulates and enhances academe and is open to interrogation by means of research.

The “pluroversity” encourages interaction between stakeholders and is thus subject to environmental influences. These influences include local challenges characterised by a continued focus on access, equity and quality. In response to the elitisation of higher

education there is a shift of focus towards reinserting the public good of higher education into the recalculation of higher education's purpose (Singh 2001:8). The shift in focus takes into account the role of higher education in developing broad-based national intellectual cultures and ensuring the vibrancy thereof, as well as the promotion of good citizenship. Higher education should facilitate the growth of economies and the achievement of other objectives, including information dissemination, service delivery, policy creation and other activities that may not be part of the core activities of higher education.

Radiography is a discipline that uses medical imaging technology to enhance diagnosis and treatment of pathology. Students are exposed to the clinical environment during WIL. Radiography WIL (cf. Section 2.8) is a set of activities, including experiential training through clinical placement, demonstration, simulation, case studies, objective structured clinical assessment (OSCA) and associated assessments that facilitate the translation of theory to practice. WIL is thus associated with the clinical environment, an environment that can sometimes be more clinical than empathetic.

To create better rounded professionals, Radiography students at the CUT have to perform SL as part of their training. A SL module for third-year Radiography students at the CUT was created in 2007. The purpose of the module is to engage communities by disseminating relevant health-related information using dramatized presentations compiled from outcomes related to SWD30AT and Clinical Radiographic Practice III (KLD30AT) modules. The SL component has a weight of eight credits or 80 notional hours derived from the credits of SWD30AT.

SL is defined by Bringle and Hatcher (1995:112) as "a credit-bearing educational experience in which students participate in an organised service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content". According to this definition SL can be regarded as an academic enterprise. In comparison to other forms of community service, such as volunteering, SL deliberately integrates community-service activities with educational objectives. This means that not every community-service activity can be regarded as SL. SL needs have to be identified by the community rather than being imposed on them by outsiders (Ross & Deverell 2004:287). Creative thinking and planning are required to make sure that the purpose of the interaction is not only achieved, but that it also reflects the outcomes of the module. Thus, high-quality SL courses demonstrate reciprocity

between the campus and the community, with each giving and receiving, each teaching and learning (Bringle & Hatcher 2005:27).

Community-based activities like SL provide an ideal opportunity for left-brain (analytical) learning paradigms but should also be broadened to encompass right-brain (creative) learning, thereby promoting more holistic approaches to reasoning. Community-based activities should facilitate community-based research activities and thereby assist communities to develop. SL is a means of rethinking the nature of the engagement between higher education and broader society; SL relies on a reciprocal and inclusive relationship between communities and higher education institutions (HEQC CHE 2006). With regard to SL, academic institutions take on a less paternalistic role. One of the advantages of SL lies in its potential to rejuvenate academe, redefine scholarship and involve society in renegotiating the role and focus of higher education.

The philosophy, rollout and process of CUT Radiography SL (Chapter 3) links up well with the previously mentioned SL definition, thus giving substance to the Everestic one-line definition of SL by Bringle and Hatcher (1995:112).

2.4 CUT COMMUNITY ENGAGEMENT PHILOSOPHY AND PLAN

The CUT's institutional Community Engagement (CE) committee drafted, discussed and approved the CUT philosophy of CE and CUT CE plan during 2013; aspects of these documents will be discussed in the next sections. The reader must note that SL is categorised under curriculum-related accredited CE at the CUT.

2.4.1 CUT Philosophy of community engagement

The introduction of the documents states that the CUT endeavours to achieve a context-specific level of CE within its framework. It adds that the CUT needs to engage in CE in order to bring about social change, and outlines that the following issues that need to be addressed at CUT:

- Ways of strengthening CE at CUT while being responsive to the needs of the community and the students;
- Ways of incorporating CE into the curriculum;
- Ways of elevating the CE image and support at CUT; and
- Ways of facilitating bilateral and multilateral university partnerships focused on CE (CUT 2013a:2).

It is important that the skills, knowledge, attitudes and values associated with CE should benefit the institutions internally and externally (the communities involved). CUT's strategy must include elements of common vision and diversity. These elements are as follows:

- Society has provided universities with intellectual and material assets and therefore universities need to give back through community interaction.
- Community voices are valid and the community must be viewed as an equal partner in CE activities.
- There is a new generation of students at universities who believe they can make a difference and therefore needs to be given this opportunity.
- Universities should empower students to put their knowledge into action.
- Universities should have an enduring impact that helps students to engage throughout their lives (CUT 2013a:3).

At the CUT communities are defined as specific, local, collective interest groups that participate, or could potentially participate, in the community-service activities of a higher-education institution. Communities are regarded as partners who have a full say in the identification of service needs and development challenges they face. The document also declares that communities participate in defining the community service and developing outcomes (and/or learning outcomes); identifying the relevant assets at their disposal; evaluating the impact of community service; and contributing substantially to the mutual search for sustainable solutions to challenges and service needs. Communities are identified in this document as a cluster of households or an entire region, as an organisation ranging from a provincial government department to non-governmental organisations (NGO), as a school, clinic, hospital, church, or mosque or a part of the university itself.

Community engagement is defined as two-way interaction between the university and a community, in which the university forms partnerships with the community that delivers beneficial outcomes for both the community and the university. Specifically, the term engagement warns against making assumptions about communities: it calls for a dialogue. It also implies that the development of the relationship itself has to be the focus of attention: The University will have to engage with communities and request communities to engage with it (CUT 2013a:5).

Community engagement can be conceptualised as a continuum determined by two important distinctions:

- (1) Who the primary beneficiaries of the service are (i.e. community or student); and
- (2) What the primary goal of the service is [i.e. community service or student learning (curriculum-related community engagement)].

2.4.1.1 *Different models for community engagement at the CUT*

Curriculum-related CE includes formal, accredited programmes or modules (national certificates, diplomas and degrees), as well as credit-bearing short learning programmes of which the purpose is SL. With reference to SL the CUT document clarifies how CE is fused into the curriculum and integrated with teaching and learning, and that research does not refer only to SL, but that SL should rather be seen as the main driver of CE (CUT 2013a:10).

SL programmes engage students in activities in which both the communities and the students are primary beneficiaries. The goals of SL programmes are to provide services to the community and to enhance student learning. The programmes are characterised by reciprocity, mutual enrichment and integration with scholarly activities. It enriches the scholarship of academic employees in the institution. Research should also play a key role in curriculum-related community engagement or curriculum-based learning.

Non-curriculum-related CE entails the professional involvement of employees in CE initiatives, where both the community and the institution's employees benefit from the engagement.

Research-related CE involves the advancement of scientific knowledge as a result of community engagement. The community is involved as a partner and the university's research capacity is used to address community problems.

Community development and capacity building entails the development of skills and knowledge of individuals in order to address specific needs of communities, resulting in capacity-building community outreach.

Community outreach is voluntary outreach activities to communities by academics,

university employees, alumni or students in response to the social, economic and political needs of communities (CUT 2013a:12).

2.4.2 CUT community engagement plan

Information that separates the CE plan from the CE philosophy relates to the following emerging focus areas:

- Eradicating poverty and related conditions (providing community members with basic education, health-care, nutrition and protection);
- Promoting human dignity and health (as it denotes respect and status for individuals and better health);
- Increasing social capacity (all levels of leadership, empathy, listening skills, negotiation and persuasion skills, conflict management);
- Development (the process of economic and social transformation); and
- Education (a form of learning in which knowledge, skills, and habits of a group of people are transferred from one generation to the next through teaching, training and research. It generally occurs through any experience that has a formative effect on the way people think, feel, or act).

The abovementioned focus areas can be divided into the following programmes: teaching, training, development, skills development and professional development, sustainable development, innovation, entrepreneurship and incubation as it relates to the overarching goals of a community. CUT's CE plan states that CE projects should encompass at least one of the following components of CE: research, SL, WIL; incubation, innovation and professional engagement (CUT 2013b,:7).

The following strategies for achieving successful CE are discussed in the document:

Consciousness raising, to be achieved by appointing CE representatives in faculties, itemising CE projects on Faculty Board agendas, and increasing CE projects by 5%.

Curriculum infusion, by structuring a staff time usage formula, i.e. 60% teaching, 40% research, 5% administration and 5% CE, which translates into two hours per week to be spent on CE activities. Furthermore, CE will be credit-bearing and compulsory for awarding of qualifications.

Teaching methods should be realigned by building understanding of and capability

regarding new ways of doing things—new/aligned curriculum processes, competencies and skills.

Increasing opportunities for flexible learning by diversifying the ways in which learning content is delivered e.g. student-centred approaches to teaching and learning.

Providing systems of support and guidance, by identifying barriers, to facilitate acceptance of, and engagement in CE. This includes staff development and using staff members' knowledge of local communities and their needs.

Sustainable growth, achieved through the enhancement of research and innovation skills.

Exploring funding mechanisms, which will be driven, by the Advancement and Marketing Department (CUT 2013b:8).

The development of a framework for SL should incorporate these strategies such as academics' orientation to SL, time spent on SL, use of diverse teaching, learning and assessment methods and the use of institutional support systems to develop sustainable growth.

2.5 REGULATORY POSITIONING OF RADIOGRAPHY

Through SAQA (2012:Online) and the National Qualifications Framework (NQF) government is attempting to change institutions of teaching into institutions that produce learning results. This outcomes-driven, learner-centred approach serves to address the economic needs of South Africa through policies and criteria that higher-education institutions have to comply with. The SAQA-registered 360-credit National Diploma Radiography (Diagnostic) qualification requires that graduates exhibit predefined graduate attributes, exit-level outcomes (ELOs) and specific learning outcomes. SL is one of the strategies that facilitate the achievement of the outcomes, as illustrated by the following example.

ELO: Demonstrate a critical understanding and application of knowledge and skills in the context of diagnostic Radiography.

ELO unpacked: Acquire an informed and detailed knowledge of diagnostic Radiography.

- Principles of anatomy, patho-physiology, physical science, radiation science and patient management are integrated to enable students to perform routine and specialised imaging techniques.
- The entire imaging procedure is followed according to set criteria in order to enable students to operate in known and unfamiliar circumstances.

SL learning outcomes for the second visit (first presentation) articulates with the above ELO as follows:

- Discuss the interactions of x-rays with matter.
- Explain radiation and radiation protection applicable in general Radiography.
- Identify the structures/anatomy of the breast on a drawing/sketch.
- Demonstrate mamma self-evaluation technique according to the guidelines.
- Describe indications for mammography.
- Explain the various mammographic projections done during routine mammography as defined by prescribed references.
- Discuss the use and the advantages of compression during mammography.
- Demonstrate knowledge of the compilation and functioning mammography imaging equipment.
- Explain the important radiation considerations and effective protection during mammographic imaging.

2.6 OVERVIEW OF TEACHING AND LEARNING PRACTICES

Human beings are constantly in the process of gaining new knowledge or changing their existing knowledge structures. This process is referred to as learning. The human capacity for learning is an important characteristic that sets our species apart from all others. Learning provides benefits for both the individual and society. For society, learning plays a key role in transmitting a culture's accumulated knowledge to new generations (Gredler 1992:2).

The way we regard knowledge influences the ways in which we see the transfer of knowledge occurring. This influences the way we seek to "manage" or "organise" the learning environment. Different facilitators have different approaches to teaching and learning, which stem from their own generalised abstracts, field-related schemata and

scripts (Wiig & Wiig 1999:2).

A discussion of learning theories follows, such as behaviourism, cognitivism, constructivism and learning strategies like e-learning, conceptual and collaborative learning, as well as problem-based learning, that can be applied during SL in the next sections will underpin the pedagogical premise of SL.

2.6.1 Learning theories

A learning theory is an organised set of principles articulating particular learning experiences, in this case, in the SL environment. It provides a conceptual framework for separate items of information. Some of the unique characteristics of a holistic approach to teaching and learning, such as SL, is that these characteristics address the underlying psychological dynamics of learning. In other words, the characteristics of SL provide a mechanism for understanding the implications of events related to learning in both formal and informal settings. As mentioned previously (Section 2.3) SL is also a useful mechanism for evaluating and redesigning teaching practices, curricula and educational resources. Each learning theory is unique and has a set of principles consistent with assumptions about the nature of learning. There is thus not one learning theory that can capture all the variables involved in all learning (Gredler 1992:4). As illustrated in the following sections, SL offers a more holistic approach to teaching and learning since it allows different learning theories to come together, to synergise and to jell.

SL facilitates advanced knowledge acquisition rather than introductory learning. Advanced knowledge acquisition follows introductory knowledge and precedes the acquisition of expert knowledge. The following sections describe the three major theories that were used during this study.

2.6.1.1 Behaviourism

Behaviourism deals with change in observable behaviour, ignoring the possibility of processes occurring in the mind. It has limitations with regards to the understanding of learning, as it states that people could model behaviour just by observing the behaviour of another person (Gredler 1992:5). Based on observable changes in behaviour, behaviourism focuses on a new behavioural pattern being repeated until it becomes automatic. It requires a low degree of processing and is facilitated by behavioural

strategies such as stimulus-response and contiguity of feedback. Learning is defined as the acquisition of behaviour (Pritchard 2005:7).

The use of orientation and outcomes introduces the SL material to students in a behaviouristic manner. The level of engagement is expressed in the cognitive level of the verbs used in the learning outcomes. To facilitate learning, the facilitator should prescribe a sequence of learning activities that will enable the learner to reach the outcomes. SL provides opportunities that will enable students to exhibit the desired responses during clinical interaction with patients. SL assists learners to provide the proper responses, and reinforcement strengthens the correct responses when students interact with community members.

2.6.1.2 *Cognitivism*

Cognitivism views knowledge as mental constructs in the learner's mind, and the learning process is the means by which these representations are committed to memory. It can be defined as the scientific study of mental processes such as learning, perceiving, remembering, using language, reasoning and solving problems (Pritchard 2005:21). Changes in behaviour are observed, but only as an indicator of what is going on in the learner's head, as alluded to in Section 2.6.1.1 (perceiving in the previous sentence). The social cognitive learning models such as SL assert that culture determines individual development. Yet, in a different view of culture, SL challenges the cognitivist notion that culture determines individual development. The learning environment influences the development of critical thinking and SL assists in broadening the classroom and cultural impetus. Before the visits of the present study, students were given a sequence of learning activities by the facilitator that enabled them to improve their critical-thinking skills. Therefore, students' learning development is affected by the culture in which they will be enmeshed.

According to cognitivism, learning activities should be structured to enable students to reach the specified outcomes. The following outlines a few principles of learning based on cognitive theory and its implications for facilitators:

- For information to be learned, it must be recognised as important (academic SL outcomes and orientation).
- Learners act on information if it has meaning, e.g. giving examples, using images.
- Learners store information in long-term memory in an organised manner.

- Learners continually check understanding, which results in refinement (cooperative learning and taking the audience into account).
- Learning is facilitated when learners are aware of their learning strategies.

It is necessary to make learning as meaningful as possible. Meaningful learning depends on the state of the individual's cognitive structure at the time of learning.

2.6.1.3 Constructivism

According to constructivism, learning starts with the issues around which students are actively trying to construct meaning (SL outcomes). Meaning requires that wholes are understood (e.g. mamma cancer) as well as parts (e.g. indications, breast anatomy, and mammography); furthermore, parts must be understood in the context of wholes. SL activities should thus be designed to enable students to complete the puzzle of knowledge. Constructivism focuses on primary concepts and the interaction between the learner and the environment; it also clarifies where students fit into the broader society. Learning happens when new information is built into and added on to existing knowledge (Pritchard 2005:21). This type of learning structure works quite well for advanced knowledge acquisition encompassed by SL activities.

Teaching strategies should be tailored to student responses and should encourage students to analyse, interpret, and predict information. Teachers following a constructivist approach rely heavily on open-ended questions and promote extensive dialogue among students. In the SL environment this can be achieved through online group discussion and structured reflection and realignment.

2.6.2 Instructional strategies

Instructional strategies are techniques used to help students become independent, strategic learners. A variety of instructional strategies, learning materials and tools should offer opportunities for students to transfer skills and ideas and create meaningful connections with real-life situations. Instructional strategies motivate students and help them focus their attention and organise information (Alberta learning 2002:67).

These instructional strategies can become learning strategies when students independently select the appropriate ones and use them effectively to accomplish tasks or

meet goals (Alberta learning 2002:67). The strategies used during SL and their application will be discussed below.

2.6.2.1 *E-learning*

E-learning is defined as the use of multimedia technologies and the internet to facilitate access to resources and services and to improve the quality of learning. It includes formal and informal learning and training activities and events through the use of all electronic media, including CD-ROM, videotape, TV, cell phones, personal organisers, computer technology, etc. (LinkOnLearning 2013:Online). E-learning also promotes remote exchange and collaboration amongst students. As discussed in Chapter 3, Radiography students have to create visually aided presentations that require them to actively use information technology (IT). This happens during preparation through literature searches and the creation of the presentations themselves. As part of this research project IT also facilitated voice recordings during reflective discussion related to the study outcomes. The facilitator is still responsible for the pedagogical manner in which these tools are used, in other words, the context that the teacher sets up is at the core of the teaching.

2.6.2.2 *Conceptual learning*

Conceptual learning is necessary to develop attitudes, skills and understanding of real-life situations (Wiig & Wiig 1999:2). Five possible cognitive and affective factors determine the success of SL, namely, personal and interpersonal development, perspective transformation, citizenship skills and values (Eyler & Giles 1999:24). Combining these factors forms the framework for conceptual learning.

2.6.2.3 *Collaborative learning*

Since learning is a social activity, preparation, presentations and discussions propagate interaction with more knowledgeable others to minimise the zone of proximal development (ZPD). Vygotsky (1978:32) believes that social learning leads to cognitive learning. Students can do or learn something better when they do it under the guidance of or in collaboration with peers. In order to close the gap between students the lecturer needs to collaborate with and guide students so that the learning experience becomes reciprocal through student collaboration. Students engaging in SL are exposed to collateral learning as they work with group members in a reciprocal relationship that leads

to mutually beneficial outcomes. Through group work the classroom becomes a learning community in which students play an active role in their own learning and in the learning of their peers. SL “puts theory into context, mixes rigor with relevance, and builds concrete skills” (Richardson 2006:38). Meaningful experiences can be profound and life-changing for all participants. Planning and implementation should reflect the true benefits of the service linked to the course objectives. Scaffolding activities and using flexible time frames allows learners to work at their own pace to this end.

2.6.2.4 *Problem-based learning (PBL)*

In problem-based learning (PBL) courses, students work with classmates to solve complex and authentic problems that help develop content knowledge as well as problem-solving, reasoning, communication, and self-assessment skills. In Radiography SL, group work is used during preparation, execution and reflection (White 2001:Online).

The outcomes presented to students are problems; this helps to maintain student interest in course material, because students realise that they are learning the skills needed to be successful in the field. PBL begins with the assumption that learning is an active, integrated, and constructive process influenced by social and contextual factors. Again, the structure, rollout and evaluation of Radiography SL encompasses the aforementioned elements. In addition to emphasising learning by “doing,” students must learn to be conscious of the information they already possess about the problem, the information they need to know to solve the problem, and the strategies to use to solve the problem. Being able to articulate such thoughts helps students become more effective problem solvers and self-directed learners. Initially, however, many students are incapable of this sort of thinking on their own and this is why collaboration is advised (White 2001:Online).

2.7 CHARACTERISTICS OF SERVICE-LEARNING

In SA, SL is distinguished from other forms of community engagement by the HEQC (2006:21) through their adaptation of Fruco’s distinction between service programmes shown in Figure 2.2.

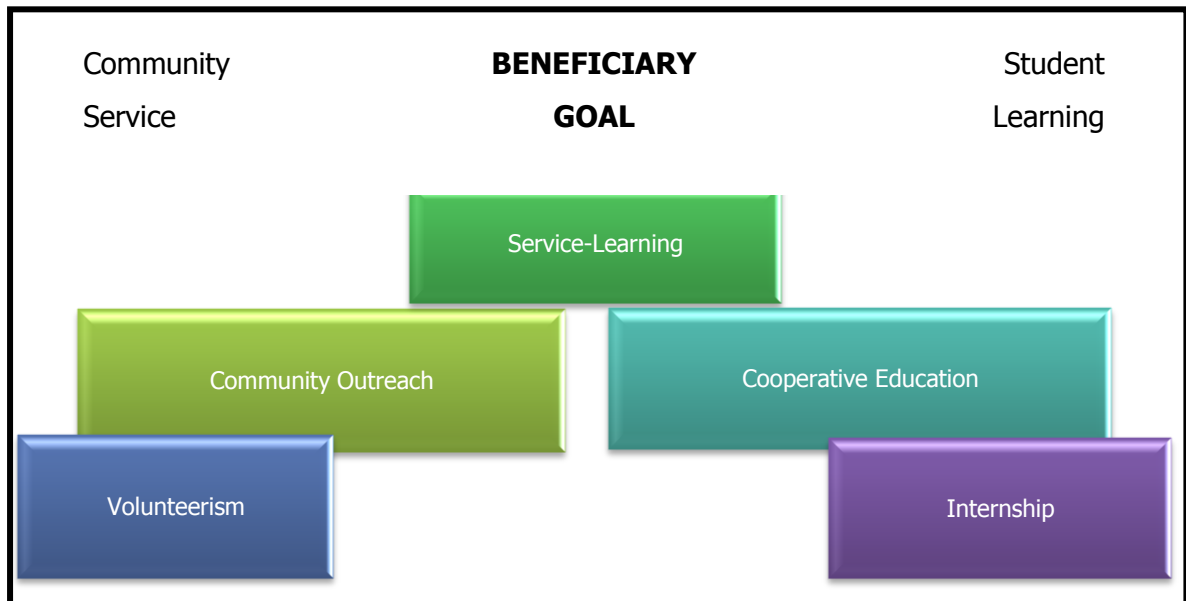


FIGURE 2.2: FURCO'S DISTINCTION BETWEEN SERVICES (IN HEQC 2006:21)

With volunteerism and community outreach the goal and beneficiary in figure 2.2 leans towards the community and the service rendered. On the right side the beneficiary and goal leans towards the student and learning associated with internship and cooperative education (aspects associated with WIL). SL's position and what differentiates it in the above typology can be clarified by the CHESP triad partnership model (cf. Figure 2.3) developed by Lazarus (Lazarus 2001 in HEQC 2006:93) that includes:

1. Community empowerment and development;
2. Transformation of students and higher-education systems in relation to community needs; and
3. Enhancing service delivery to previously disadvantaged communities.

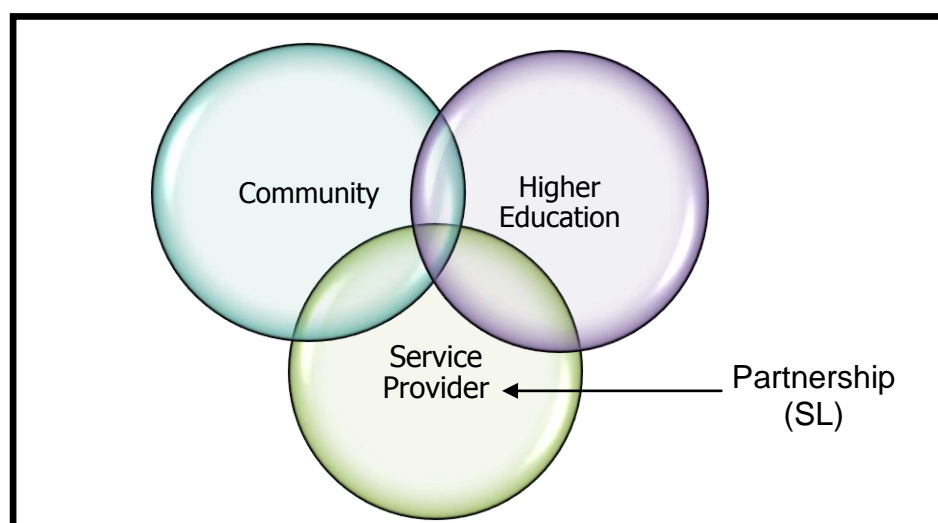


FIGURE 2.3: CHESP TRIAD PARTNERSHIP MODEL (LAZARUS 2001 IN HEQC 2006:93)

The figure illustrates that with SL the community, higher education (including students)

and the service provider benefits and the goal is both service and learning. And as mentioned in Section 1.2.4 when both service and learning are equally important, the words are combined with the hyphen, indicating a relationship, the pedagogy is written as SERVICE-LEARNING. Apart from its academic merits, like integrated and holistic education, SL also helps to develop the complete being. To achieve this, the starting point is social empathy followed by social response and proactive social contribution towards social justice for the collective good.

SL is a method whereby participants learn and develop through active participation in thoughtfully organised service that is conducted in and meets the needs of a community and which is coordinated by an institution of learning.

Previous studies on the characteristics of SL (Zlotkowski 1998:3; Duckenfield & Swanson 1992:5 and Roos, Temane, Davis, Prinsloo, Kritzing, Naudé, Wessels 2005:704) have shown that courses incorporating SL generally provide greater learning benefits than those that do not. These benefits include a deeper understanding of course material, a better understanding of complex problems, and an ability to translate theory to the ever-changing imaging environment and real-world problems. Research also suggests that integration of SL activities enhances the achievement of module and course outcomes, improves facilitator-student relationships and helps facilitators to understand student learning styles better. SL also promotes academic (cognitive) and social (affective) integration and consequently leads to increased student retention (Hurd 2006:Online).

In Figure 2.4 Kolb's experiential learning cycle provides the theory for learning associated with SL. It describes how students migrate from direct experience (in a community-service context) to action (in the clinical service context), which is linked by reflection and abstract formulation.

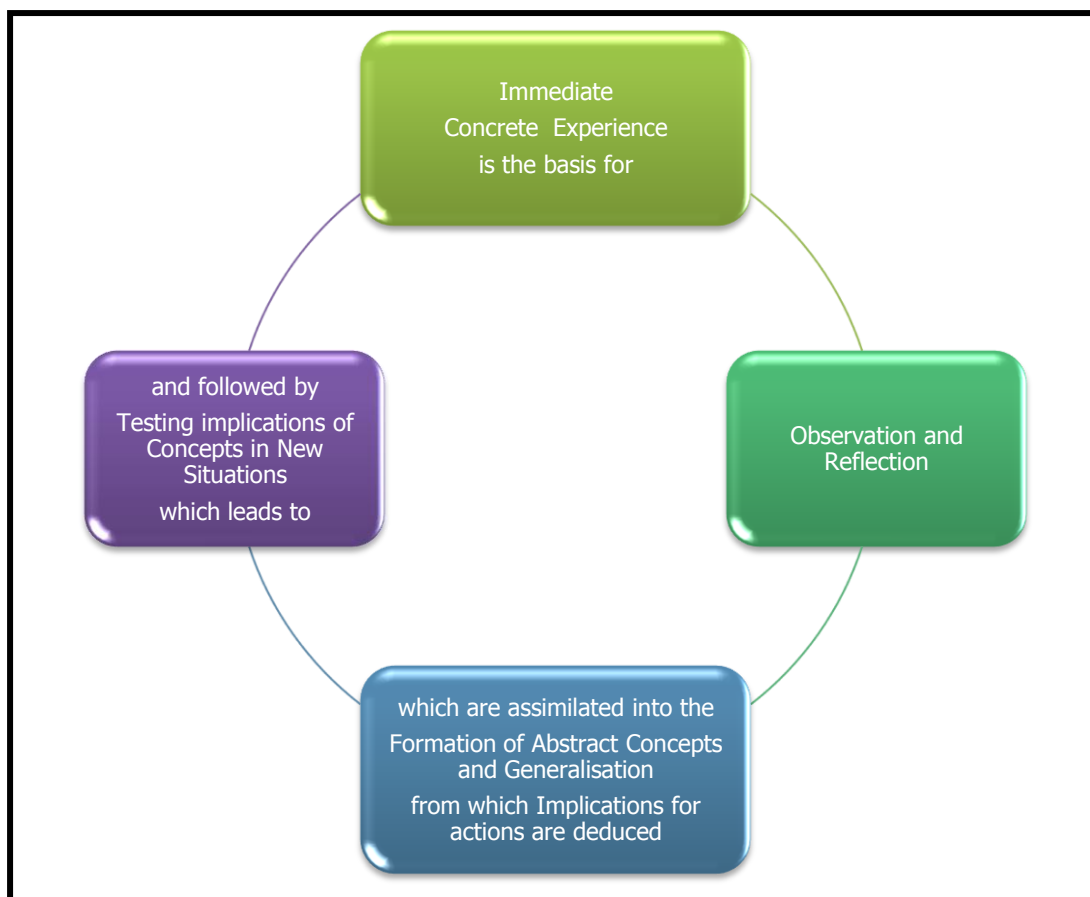


FIGURE 2.4: KOLB'S EXPERIENTIAL LEARNING CYCLE (KOLB 1984 IN HEQC 2006:18)

The cycle is suitable for SL programmes since it necessitates concrete experience of social realities outside the institution. Learning is a continuous process of experience, interpreting and processing experience, and taking appropriate action. The net result of these actions is to increase the service provided to the community.

The Alliance for Service Learning in Education Reform (ASLER) standards and the benefits of SL to all participants are listed.

2.7.1 ASLER standards

Members of the ASLER developed the following standards to promote quality in school-based and community-based SL programmes.

1. Effective SL strengthens service and academic learning.
2. Model SL provides opportunities for students to learn new skills, to think critically, and to test new roles.
3. Preparation and reflection are essential elements in SL.

4. Students' efforts are recognised by those served, as well as their peers, the institution, and the community.
5. Students are involved in the planning.
6. The services students perform make a meaningful contribution to the community.
7. Effective SL integrates systematic formative and summative evaluation.
8. SL connects the academic institution and its community in new and positive ways.
9. SL is understood and supported as an integral element in the lives of the institution and its community.
10. Skilled adult guidance and supervision are essential to the success of SL.
11. Pre-service training, orientation, and staff development that include the philosophy and methodology of SL ensure that programme quality and continuity are maintained (Duckenfield & Swanson 1992:5).

By providing opportunities to develop skills and attitudes necessary in the clinical environment the Radiography SL intervention was designed to comprise both service and academic learning. The research instruments used during the study allowed the researcher to assess the extent to which this is happening. By involving students in the planning and using reflection, and formative assessment students are encouraged to connect the academic institution and the community and become more socially responsive.

2.7.2 Benefits of SL

How does SL benefit all parties involved? This question will be answered in relation to students, the community and the academic institution, in Sections 2.7.2.1 to 2.7.2.3.

2.7.2.1 Benefits to students

Among some of the benefits to students, SL projects allow students to develop critical-thinking skills, social understanding and civic participation, which is at the core of the engagement (Eyler & Giles 1999:12). Further, it renews the educational process holistically. SL allows "induction to complement deduction, personal discovery to challenge perceived truths, immediate experience to balance generalisations and abstract theory" (Zlotkowski 1998:3).

Most students have critical needs regarding personal, social, and intellectual growth, as well as civic responsibility and career exploration. SL enriches the lives of all students in

allowing them to become successful and productive members of an enriched society (Duckenfield & Swanson 1992:5). Duckenfield and Swanson (1992:5-12) give a more complete picture of the benefits of SL to students and will thus be referred to often in the next paragraphs. Confirming statements from other works will be used to add validity to the statements by Duckenfield and Swanson (1992:5-12).

Benefits of SL to students can be classified as follows:

Personal growth refers to the development of characteristics related to self-improvement and self-actualisation. SL improves students' self-confidence, self-esteem and self-understanding by allowing them to acquire a sense of identity, independence and autonomy by being open to new experiences and roles. Students' personal values and beliefs are strengthened through them being useful as well as them having the ability to take risk and accept challenges (Duckenfield & Swanson 1992:5). The effect of SL on the aforementioned aspects was evaluated using a reflection rubric.

Social growth includes the social skills that are necessary for relating to others in society. Examples of these skills are,

- Communication skills,
- Leadership skills,
- Ability to work cooperatively with others,
- A sense of caring for others,
- A sense of belonging,
- Acceptance and awareness of others who are from diverse and multicultural backgrounds, and
- Peer group affiliation (Duckenfield & Swanson 1992:5).

The social growth factors mentioned reflect both graduate attributes and social responsiveness elements. These factors also relate to two of the research objectives of this study:

2. To establish whether SL cultivates social responsiveness in students.
3. To investigate the effectiveness of SL in allowing students to achieve the graduate attributes.

SL heightens students' awareness of their role in society and thereby helps in the national drive of citizenship development by integrating new generations of intellectuals into the process (Bawa 2003:52).

Intellectual growth encompasses the cognitive skills necessary to enhance academic learning and acquired higher-level thinking skills. Intellectual growth can be facilitated through the application of knowledge, problem-solving and decision-making skills during group discussions used during this study. Additionally having to apply critical-thinking skills during preparation and execution of the intervention and using skills necessary to learn from experience assists in the development of positive attitudes towards learning (Duckenfield & Swanson 1992:6).

The benefit of SL is that learners take responsibility for their own learning, since they are actively involved in what they are learning. Furthermore, the dialogue between learners and facilitators encourages a process of interactive reflective learning (Burnard in Roos, Temane, Davis, Prinsloo, Kritzinger, Naudé, Wessels 2005:704).

Citizenship refers to the responsibilities relating to participation in a multicultural society and of citizenship in a democracy, and includes,

- A sense of the responsibility to contribute to society,
- Democratic participation (informed citizen, exercises voting privileges),
- Awareness of community needs,
- Organisational skills,
- Social-action skills (persuasion, policy research, petitioning), and
- Empowerment, belief in own ability to make a difference (Duckenfield & Swanson 1992:6).

As was the case with social growth factors, citizenship reflects social responsiveness elements, but also personal growth. The effect of SL on the citizenship was evaluated using a reflection rubric.

Preparation for the world of work: Students who have been prepared are able to gain work experience in a variety of areas, such as, human-service skills, ability to function as a member of a team, skills relating to reliability (punctuality, consistency, regular attendance) and professionalism (dress, grooming, and manners). The SL guide

received by students during this study which was also used during orientation addressed these competencies. SL thus allows students to develop realistic ideas about the world of work and to follow directions (Duckenfield & Swanson 1992:6).

SL makes connections for students: SL can provide a sense of belonging among students. Working as a team on a meaningful activity where a real difference is being made in the community can have enormous impact. Solving problems with peers can bond students and provide the support base needed by these young professionals (Duckenfield & Swanson 1992:11).

Srinivas and Wrench (2012:109) found that students felt that working as part of a group was helpful in their SL elective. One student articulated: "Working as a group is beneficial as the workload is equally distributed and becomes manageable". Students either strongly agreed or agreed that working in a group contributed to their learning and feeling of deep personal satisfaction.

SL improves the scope of learning by students by exposing them to communities' developmental issues. The real-world problems addressed by SL allows for integration of compartmentalised categories within which much university learning takes place (Bawa 2003:52).

Developing self-esteem: A characteristic common to students who drop out is low self-esteem. Failure at school and in other activities in life substantiates feelings of inadequacy. Student self-esteem is more highly correlated with student success than Intelligence Quotient (IQ) is (Duckenfield & Swanson 1992:11). It is therefore incumbent upon educators to seek out ways to enhance the self-esteem of students in order to maximise their academic success.

SL promotes real success: SL offers opportunities for promoting self-esteem. Whether a student is serving as a tutor for first years and simultaneously becoming a role model, or whether he/she is providing needed services at an retirement home, this student is growing in self-esteem. To actually live the act of being helpful to another person, as is the case with SL, is to gain in self-esteem. The development of social skills used in SL situations also provides the student with confidence and thereby increases self-esteem (Duckenfield & Swanson 1992:11).

SL empowers students: SL provides opportunities for teaching young people the skills they need to become empowered. By becoming involved in projects that address real problems, students become problem solvers. By working with other students to solve these problems, they become team players. By working with adults in service situations, students develop communication and social skills. All of these activities are prerequisites for becoming empowered (Duckenfield & Swanson 1992:12).

SL changes the values of students: Guided, structured reflection in SL shapes values and beliefs and creates a better future through collaboration with different parties. Civic engagement through SL encourages active participation in democratic citizenship and working towards solving problems. Students will be confronted with both the aforementioned challenges during their professional lives (Julie, Daniels & Adonis 2005:51).

The work of Duckenfield and Swanson (1992:5-12) articulates with that of Eyler, Giles, Jr., Stenson, and Gray (2000:34), who state that SL affect students in their awareness and involvement in the community, personal development, academic achievement, sensitivity to diversity, interpersonal skills, learning, and application of learning.

2.7.2.2 *Benefits to the community*

Literature (Dewey 1938:20; Ross & Deverell 2004:287) indicates that, through collaboration and consultation in the planning, creation and implementation of the SL programme, not only are the academic and professional needs of students met, but community members benefit and gain new knowledge (Alperstein 2007:59).

SL facilitates sustainable development of communities by integrating knowledge, skills and resources, thereby effecting social and economic transformation. Sustainable development encompasses concepts like,

- the achievement of lasting satisfaction of human needs,
- the improvement of the quality of human life,
- the idea of self-reliant development, and
- the idea of cost-effective development.

Vernon and Ward (1999:30) explored the community's perceptions of students and

academics involved in SL. They found that communities had an overwhelmingly positive perception of universities in their area. Communities reported that there are benefits and challenges to working with students and that there needs to be better communication and coordination between stakeholders (Vernon & Ward 1999:32).

2.7.2.3 Benefits to academe

SL comes with the intellectual challenge of pragmatizing scholarship and its applicability to community needs. Tertiary institutions benefit from SL since SL emphasises institutions' relevance to their environment and allows for new, interdisciplinary cooperation. SL provides a unique opportunity for students to internalise their knowledge and to recognise the value it has for the community and society (Julie *et al.* 2005:51).

The following benefits to academe can be associated with SL:

- Reciprocity;
- Enhanced relationships between the community and the academic institution;
- Improved student retention;
- Enhanced Institutional commitment to communities and SL; and
- SL becomes integrated into institutional programmes.

The above benefits can be regarded as the unpacking of what Behera and Erasmus (1999:3) infer, namely, that human beings can also be regarded as resources in the concept of SL. Nevertheless, few institutions make SL a requirement for their academic core (Bellner & Pomery 2005:91).

2.8 CHARACTERISTICS OF WORK-INTEGRATED LEARNING

SAQA (SASCE 2010:Online) defines WIL as career focused education that includes theoretical forms of learning that are appropriate for professional qualifications. WIL could thus be described as an educational approach that *aligns* academic and workplace practices for the mutual benefit of students and workplaces. WIL is an educational strategy combining institution-based academic teaching and learning with time spent in a workplace relevant to the programme of study and career aims (Houshmand & Papadakis 2007:6). WIL refers to "learning by doing" and, according to Coll and Eames (2007:132), cooperation takes place between the student, higher education and the workplace, all

parties working in collaboration to develop a comprehensive skill set in students (Coll 1996:29).

Where WIL is a structured part of a qualification the volume of learning allocated to WIL should be appropriate to the purpose of the qualification. It is also the responsibility of institutions that offer programmes requiring WIL credits to place students into WIL programmes. Such programmes must be structured and properly supervised and assessed (Forbes 2007:2).

SASCE states clearly that WIL should be directed at the attainment of professional or occupational learning outcomes. The Society confirms that WIL should not involve experiential learning exclusively but should include a continuum of learning that is curriculum driven and is therefore designed and executed at the required NQF levels of the qualification.

WIL programmes exhibit four core elements:

- A curriculum integrated with industry needs;
- A work component included in the curriculum for students to learn through experience;
- A group of workplaces offering appropriate placements for students to ensure that the tertiary course remains relevant; these providers of work give advice and input regarding the curriculum; and
- Well-defined logistics, so that the programme provides clear detail about its organisation, coordination and assessment of students (Groenewald 2004:19).

A key purpose of WIL is to provide graduates with a comprehensive skill set desired by potential employers. It is difficult for higher-education providers to provide students with these skills, especially the so-called behavioural or soft skills. In Radiography this is achieved through strategies like PBL and WIL.

SASCE defines SL as applied learning that is directed at specific community needs. SL should be integrated into the academic programme of the curriculum, it should be credit bearing and assessed and may or may not take place in a work environment (Forbes 2007:2). In other words, SL is aimed at enhancing the civic responsibility of students within the context of the curriculum. The purpose of SL is therefore to engender a sense

of civic responsibility in students by enabling them to share the knowledge, skills and attitudes learned during their studies, with civic society.

Both WIL and SL take place during higher education (it is curriculum driven) with the major difference between the two concepts being that WIL is industry-based and SL is community-based. In other words, WIL takes place in the specific industry that informs the purpose of a specific qualification. In this case a partnership has been formed between the university, the industry (workplace) and the student. In SL the partnership is formed between the university (including the students), a community of people and a service provider. However, both strategies have the ultimate aim of linking what the student has learned in the classroom (contextual knowledge) with the real situation in the world of work outside the classroom (conceptualisation of knowledge).

2.9 SERVICE-LEARNING RESEARCH

The increase in SL courses has led to a boost in empirical studies on the impact of SL on student outcomes (Eyler 2002:518). There has been little investigation into the impact of SL on communities and on institutional goals. This study addresses the impact of SL on communities by using a variety of rubrics that evaluate these aspects directly (Appendix Grade 12 rubric, contact person rubric, reflection rubric). Studies on community enhancement have found that community partners generally value the services offered by students (Nigro & Wortham 1998:161).

2.9.1 Use of reflection in service-learning

While many academic offerings are called SL, the actual experiences of students range from intensive community experiences with integration into academic study, to brief "add-on" service activities largely unconnected to academic work. The definition of SL highlights the importance of reflection. Reflection is the "intentional consideration of an experience in light of particular learning objectives" (Hatcher & Bringle 1997:153); this is one of the most important principles of good practice.

Reflection is a foundational principle of SL and is regarded as the glue (hyphen) that holds service and learning together (Eyler & Giles 1999:10). Reflection assists students to acquire the skills and attitudes needed to evaluate their own professional practice and to contextualise the role of the radiographer and themselves within broader society.

Reflection therefore provides higher-education institutions with feedback useful in strategising ways of incorporating service as a means to extend the institution's mission (the "pluroversity" concept), and to enhance student achievement by incorporating community engagement as part of their academic curriculum (Bringle & Hatcher 1995:112).

In this study, an adaptation of Zlotkowski's (in HEQC 2006:74) and Laplante's (2007:231) structured reflection was used to gain insight into the academic enhancement and learning achieved by students, as well as their social responsiveness and personal growth.

The use of interactive reflection discussions leans to constructivism, according to which learning is mediated by interaction, social relations and language. Language does not only refer to communal understanding and dialogue, but also to the specific jargon associated with a particular profession or discipline, and understanding of the reflective process (refer to Wellington & Austin (1996:307-316) below). Discussion also promotes the premise that dialogue defines understanding. According to Dewey (1938:48), collateral learning can, in some instances, be more important than the intended lesson itself, thereby connecting Naudé's "I" to the "we" and in doing so including the main components of education (Naudé 2010:74).

Wellington and Austin (1996:307-316) suggest five orientations for reflective practice, namely:

Immediate: emphasises pleasant survival, and happened within a short time after the intervention; *in this study reflection happened within a week after the intervention,*

Technical: focuses on the development and conceptualisation of learning throughout the experience; *the reflection rubric used during this study reflects this,*

Deliberative orientation: emphasises the discovery, assignment and assessment of personal meaning; *again, the reflection rubric used reflects this,*

Dialectic orientation: advocated political liberation; *this was not measured in this study,* and

Transpersonal orientation: centres on universal personal liberation.

SL research (Kendall 1990:42) promotes the idea that reflection will improve the personal, social and intellectual characteristics necessary for effective civic engagement. Few studies have measured important outcomes, such as intellectual prerequisites for effective citizenship, such as knowledge about social issues, skills related to civic participation, or capacity to deal with complex social issues. Considering the objectives of the study

(Section 1.4.3) it is evident that most of these aspects are covered by this study. These outcomes are also what differentiate SL from more traditional instruction methods. Eyler mentions that SL connects experience with academic study through extensive reflection and could contribute to a deeper understanding of social problems and to cognitive development, making it possible for students to identify, frame, and resolve ill-structured social problems (Eyler 2002:521).

Hatcher and Bringle (1997:Online) identified the following criteria for producing effective reflection:

- **Bridge the abstract and the concrete:** SL scholarship and research should contribute to both theoretical understanding and practical solutions associated with the multiple facets and outcomes of SL. *The structure and questioning of the reflection rubric allows for this.*
- **Be regular:** SL scholarship and research should be conducted across the implementation of a course, at strategic times for a campus programme, and in a manner that demonstrates growth over time in its capacity to contribute to knowledge and practice. *The scaffolding of activities presented in Section 3.3.2 provides evidence of this practice.*
- **Be structured:** SL scholarship and research should be systematic, and programmatic, and must allow for clear inferences that increase the knowledge base for teaching and learning. *The structure and questioning of the reflection rubric allows for this.*
- **Permit feedback and assessment:** SL scholarship and research should be public (use procedures that are identifiable and understandable) so that it can be reviewed, evaluated, critiqued, and recognised by peers and others (students, service providers, community members). *In this study group reflection discussions were conducted within one week after interventions.*
- **Clarify values:** SL scholarship and research should guide work within a system that honours certain types of knowing and that contribute to the integrity of the work and outcomes that promote justice and democratic participation, and enhance the quality of life (Bringle & Hatcher 2005:28). *The structure and questioning of the reflection rubric allows for this.*

Elam, Sauer, Stratton, Skelton, Croeker and Musick (2002:198) studied informal reflective discussions and writing in an SL elective course for medical students. Students participating in SL were introduced to populations different from themselves and then had

to complete a reflection questionnaire. The reflection questionnaire was structured to assess personal experiences and the effectiveness of the different groups. The results indicated initial apprehension that changed into personal gratification. When students reread their reflective writing at a later date, they gained further insight into themselves and their experiences.

Pharmacology students at the University of the Western Cape work in collaboration with community pharmacists at primary health-care clinics. Students experienced the perceptions of patients and the challenges the patients face. Students were able to add meaning to their theoretical knowledge, from the cognitive to the constructive. Students became more empathetic and had an integrated understanding that went beyond what can be taught in the lecture hall (Erasmus 2007:34).

Cameron, Wolvaardt, Van Rooyen, Hugo, Blitz and Bergh (2011:373), in a study at the University of Pretoria, required fifth-year medical students to complete a semi-structured reflective journal. The three-stage model of Toole and Toole was used during this study. The questions in this model can be summarised as "What?", "So what?" and "Now what?" The "What" question focuses on the actual experience. The "So what?" question requires students to evaluate the experience with reference to their theoretical knowledge. The "Now what?" question determines whether and how this experience changed students' perceptions and influenced their future endeavours. Similarly the researcher used the reflection tools of Zlotkowski (in HEQC 2006:74) and Laplante (2007:231) that has identical themes in its questioning. The results of the structured reflections of the study of Cameron *et al.* (2011:378) indicate that challenges and complexities of working in primary health-care settings encouraged active learning and the development of critical-thinking skills, and changed students' orientations to learning).

The use of reflection also leads to transformative learning, which will be put into context in the next section.

2.9.1.1 Transformative learning

Kolb's experiential learning cycle (Section 2.7) indicates that students have to analyse experience and change practices; from the discussion of reflection it should be clear that reflection leads to transformative learning. Mezirow's model for transformational learning is a guide to reflection in SL because it focuses on how students make meaning of their experiences. It also frames how significant learning and behavioural change result from

the way people unravel ill-structured problems, critical incidents, and/or ambiguous life events. Mezirow's model provides explanations unique to SL: it describes how different modes of reflection, combined with reflection discussion, assist students to engage in more justifiable and socially responsible action (Kiely 2005:6).

In a study by Kiely (2005:8) the construction of reflection, keeping Mezirow's model in mind, allowed students to experience significant change in the ways they understood their identities, cultures, and behaviour. This phenomenon is known as "perspective transformation". Perspective transformation is most commonly triggered by a disorienting dilemma—a critical incident or event that acts as a trigger that can, under certain conditions (e.g., opportunities for reflection and dialogue, openness to change), lead people to engage in a transformational learning process. In these instances previously-taken-for-granted assumptions, values, beliefs, and lifestyle habits are assessed and, in some cases, radically transformed.

In the following section Mezirow's transformational Service-Learning Process Model will be discussed.

Contextual border crossing can involve personal (biography, personality, learning style, expectations, prior travel experience, and sense of efficacy), structural (i.e., race, class, gender, culture, ethnicity, nationality, sexual orientation, and physical ability), historical (i.e., socioeconomic and political history), and programmatic factors (i.e., intercultural immersion, direct service-work and opportunities for critical reflection and dialogue with diverse perspectives, and a curriculum that focuses on social-justice issues such as poverty, economic disparities and unequal relations of power). All of these intersect to influence and frame the way students experience the process of transformational learning in SL.

Dissonance refers to incongruence between participants' prior frames of reference and aspects of the contextual factors that shape the SL experience. There is a relationship between dissonance type, intensity, and duration and the nature of learning processes that result. Different intensity levels of dissonance act as triggers for learning. High-intensity dissonance is the catalyst for ongoing learning. Dissonance can be categorised as historical, environmental, social, physical, economic, political, cultural, spiritual, communicative, and technological dissonance.

Personalising refers to the way participants respond individually to and learn from different types of dissonance. The response is intuitive and emotional, and requires students to evaluate their strengths and weaknesses. These emotions and feelings include anger, happiness, sadness, helplessness, fear, anxiety, confusion, joy, nervousness, cynicism, sarcasm, selfishness, and embarrassment. Processing these emotions and feelings is both an individual reflective learning process (journaling, structured reflection) and a group dialogic learning process (reflection groups, community dialogues). Processing can involve problematising, questioning, analysing, and searching for causes and solutions to problems.

Connecting learning relates to affectively understanding and empathising through relationships with community members, group members and academics. In this instance, learning occurs through nonreflective modes such as sensing, sharing, feeling, caring, participating, relating, listening, comforting, empathising, intuiting, and doing. Examples include performing dramatised presentations, singing, dancing, and sharing stories (Kiely 2005:8).

Reflection is not only a way for students to articulate the experience, but also involves introspection that leads to personal growth and social responsiveness.

2.9.2 Social responsiveness

As discussed in Section 2.3 (Pedagogical Regression), it is sometimes necessary to use all available resources, to go beyond the classroom and textbook, to provide educational experiences that give rise to and encourage social responsibility. Burnard (in Roos *et al.* 2005:704) adds that people do not live their lives out of books.

SL enables students to develop professionalism while meeting community needs and contributing to the greater needs of society in the process (Levy & Lehna 2002:220). It also provides opportunities for students to perform activities beyond the scope of the curriculum and enables them to develop an attitude of civic engagement. SL also provides a broader appreciation of the specific profession or discipline and enhances the sense of civic responsibility (Julie *et al.* 2005:42).

Hurd (2006:Online) indicates that students participating in SL report a greater understanding of social problems, and exhibit greater knowledge of other cultures. SL

also gives rise to acceptance of diverse cultures and races, and a greater ability to get along with people of different backgrounds and increases awareness of own biases. By moving outside of themselves and their comfort zones, combined with collaboration with diverse groups, students can gain greater appreciation of the strengths and capacities of diverse groups. The self-awareness of students increases due to "encounters with strangers", facing "alien situations" and "shocks of awareness" (Hurd 2006:Online).

Using a meta-analysis of studies into the impact of SL on students, Celio, Durlak, and Dymnicki (2011:170) discovered, among other findings, the following SL-related introspections: Civic engagement, including any outcome measure oriented toward, or directly affecting, the community (i.e., altruism, civic responsibility) improved students social skills. Social skills included skills generally directed toward other people, such as leadership skills, cultural competence, and social problem solving. Data from 62 studies indicate that students who participate in SL programmes demonstrate significant gains in these areas. Results show that SL programmes can benefit students at different educational levels and in several ways. These benefits include an increase in positive attitudes and behaviours towards community involvement, and increases in social skills.

Martinez-Mier, Soto-Rojas, Stelzner, Lorant, Riner and Yoder (2011:2) used student questionnaires and journals to evaluate the International SL programme that medical and dental students in America participate in during their spring break. The community they interacted with are rural Mexican migrants. Cultural competence is a core set of skills learned by health-care workers to enable them to treat and communicate health-care information with a diverse patient population in a respectful and effective manner.

Culturally competent health-care workers are able to communicate with an awareness of barriers that hinder access to health facilities and services. This includes awareness of the differences in health outcomes experienced by some groupings. Culturally competent health-care workers understand sociocultural factors that influence health beliefs and behaviours expressed by diverse patients; this understanding enables them to manage those patients appropriately (Martinez-Mier *et al.* 2011:2).

In their study Martinez-Mier *et al.* (2011:7) found that the majority of students agreed or strongly agreed that SL assisted them in understanding different cultures better. Students indicated that this interaction prepared them to take an active role in their communities. SL improves patient-provider communication and increases cultural awareness, since it includes structured orientation, student self-assessment, and promotion of ethics of service and student reflection. SL connects meaningful community service, community-based research, communication and cultural competence skills

development. Martinez-Mier *et al.* (2011:10) also declare that SL connects school-based learning, personal growth and civic responsibility.

Prinsloo, Joubert and Du Toit (2006:97) report that, in 2000, a new undergraduate medical education programme was implemented at the University of the Free State (UFS). The rationale for the programme was to provide doctors who have the knowledge, skills, professional thinking, behaviour and attitudes to practise in all spheres of medicine and health-care and who can provide a professional service (UFS School of Medicine 2000:3). The new curriculum aimed to achieve specific attitude-related objectives by means of community-based education. These attitudes should emphasise a desire to serve humanity, respect for all human rights, recognition of ethical values, a community orientation, and a willingness to adapt to local circumstances and a changing environment. Participants completed a questionnaire using a 4-point Likert scale for the quantitative questions: 4 = strongly agree, 3 = mildly agree, 2 = mildly disagree and 1 = strongly disagree, and 74.2% of the students strongly agreed that working across cultural borders was a positive experience.

In total 85.5% strongly agreed that it was positive experience in relation to exposure to circumstances and communities students did not know. Positive change in attitude towards the community they served was reported by 77.9% of students, and 79% changed their perception about the community after interacting with the community. The majority of students (93.6%) strongly agreed that early exposure to the community had stimulated their enthusiasm for their studies. In relation to future participation in similar community-engagement projects, 72.6% of students strongly agreed that the community interaction was positive experience. This is underlined by some students specifically commenting that they needed more community exposure or that community-based education should continue through all years of study.

Rhodes University provided its pharmacy students with the opportunity to prepare for their professional roles through a SL elective. Srinivas and Wrench (2012:108) used a reflective portfolio in which specific criteria were used to evaluate the SL elective for final-year pharmacy students. Students reported an increase in, amongst others, responsible citizenship and cultural and aesthetic sensitivity. SL participation prepared students to be responsible citizens and exposed gaps in general health promotion in developing countries, specifically in the public sector. One student's comment was, "I intend to work in public sector. This corresponds to my belief that access to healthcare is a human

right". SL prepared students to be culturally and aesthetically sensitive; these are some of students' responses: "choosing words carefully so as to avoid making anyone feel uncomfortable", "understanding cultural myths and being sensitive" and "using pictures and languages in quizzes appropriate to all cultural groups".

2.9.3 Graduate attributes

White Paper 3 (RSA DoE 1997) declares that graduate attributes have to be incorporated into the design of all learning programmes in higher education. These graduate attributes are also known as critical cross field outcomes (CCFO) (SAQA 1997:Online) and graduate skills, since they indicate the type of graduate required by a profession. These outcomes are meant to contribute to the personal development of the student as well as the economic development of the country.

In a study done at Leeds University, O'Halloran (2001) found that employers need certain graduate attributes in newly qualified radiographers: communication, teamwork, team leadership, problem solving, initiative, planning and organising, adaptability and flexibility, computer literacy and numeracy. There is high correlation between these skills and the SAQA graduate attributes, indicating their importance for qualified radiographers internationally.

Since it is universally expected that students exhibit these "soft" skills, academics is required to directly and/or indirectly include them in teaching and learning strategies. Taking South Africa's diverse student cohort into account, this should be done using a variety of facilitation methods, including SL. SL provides collaborative-learning opportunities for students to achieve these skills in the classroom (mind mapping, brainstorming and discussion) as well as in the community (when doing actual presentations). Having to prepare and execute information sessions related to specific outcomes requires students to actively delve into the academic work, thereby giving credence to Astin's theory, which states that "students learn by being involved" (Swindon 2005:18).

In addition to the development of social responsibility Srinivas and Wrench (2012:8) also investigated graduate attributes. Students indicated that, initially, they found SL challenging and thus had to come up with solutions by being "creative and original". Having a common goal required students to pool the strengths of all group members, requiring them to work effectively in a team. Students reported having to take personal

responsibility and delegate tasks within the group, which involved “inherent creativity, shared insight, enthusiasm, motivation, and generating ideas for the team to succeed” within a specified time frame.

All students reported that they experienced challenges in communicating with their audiences, especially while responding to questions based on popular myths, for instance that HIV is spread by mosquito bites. Students had to explain that this was not the case, and they found it difficult to convince all attendees. The effective use of visual aids like posters on health conditions, along with interactive models and information leaflets, however, had a more positive impact. Communication amongst student groups and with the course facilitators, including the interactive use of *Moodle™*, was also named as factors aiding effective communication (Srinivas & Wrench 2012:9). Further, students had to achieve the outcomes through the use of science and technology and were able to explore e-learning strategies. Students explained how workshops with various experts helped them to develop computer-based quizzes and to design posters. Students indicated that these interactions enhanced the skills they would need as future pharmacists.

2.9.4 Critical-thinking skills

Critical thinking is a reasoning process that involves reflecting on ideas, actions and decisions (Sedlak, O’Doheny, Panthoffer & Anaya 2003:100). The development of people’s critical faculties is the only education that makes good citizens, as individuals educated in this way are not easily persuaded, but rather seek out and analyse evidence. Beyer (1987:17) describes three key components of critical thinking, namely cognitive operations, knowledge and attitude. Thinking is neither a vague process nor a one-dimensional undertaking since the aforementioned key components are interrelated. Thinking processes fall primarily under cognitive and metacognitive operations. Critical thinking is a cognitive operation since its purpose is to find meaning, such as distinguishing between what is relevant and what is irrelevant (Beyer 1987:17). The second component of knowledge refers to heuristics on how to execute various thinking operations, which result from experience. The final element of knowledge refers to domain knowledge (using reliable sources of data, domain-specific heuristics, analytical and organisational concepts). The attitudes or dispositions associated with critical thinking includes a willingness to suspend or alter judgement, curiosity, and respect for the truth.

Paul (as cited in Sedlak *et al.* 2003:100) identifies three dimensions of critical thinking, namely, elements of reasoning (identifying problems, identifying assumptions, developing multiple points of view and recognising consequences of actions), abilities of reasoning (raising questions, clarifying issues, generating solutions and evaluating actions), and traits of reasoning (affective attitudes, including fair-mindedness, humility, courage, confidence and integrity). The authors again include dimensions of personal growth and social responsibility. In a study by Julie *et al.* (2005:51) responses from students showed that the SL setting compelled them to assess the situation and its demands, and then apply their learning and skills to address these demands, which meant the students engaged in independent thinking. In contrast to Paul (as cited in Sedlak *et al.* 2003:100) and Julie *et al.* (2005:51), Beyer (1987:26) distinguishes between thinking strategies such as problem solving (recognize a problem), decision making (define the goal) and conceptualisation (identify examples) and critical-thinking skills which are:

- Distinguishing between verifiable facts and value claims;
- Distinguishing relevant from irrelevant information;
- Determining factual accuracy of a statement;
- Determining the credibility of a source;
- Identifying ambiguous claims or arguments;
- Identifying unstated assumptions;
- Detecting bias;
- Identifying logical fallacies;
- Recognising logical inconsistencies in a line of reasoning; and
- Determining the strength of an argument or statement.

The structure of the Watson-Glaser Critical Thinking Appraisal tool [Watson & Glaser 2002:Online (cf. Section 2.9.4.1)] used during this study allowed for the evaluation of the skills mentioned using five different tests. Beyer continues by adding that thinking strategies draw on critical-thinking skills to achieve its goals.

In addition, critical thinking is also viewed as a developmental process, which includes lifelong learning, self-directed and continuing education (Drennan 2009: 423). Cromwell adds to this notion of a developmental process by defining SL as “a complex set of abilities and a willingness to deal with ideas”, where critical thinking is not a discrete, isolated proficiency, but is conceptualised and learned within a specific discipline

(Cromwell 1986: 2). It can be said that SL helps students develop not only as “traditional experts” but also as “expert learners”. Higher education has long been concerned about producing “traditional experts”, that is, people who have mastered a body of knowledge and who know answers to important questions in their disciplinary field. SL develops students as “expert learners,” that is, as people who are able to approach new situations flexibly, are skilled at acquiring new knowledge quickly and efficiently, and are able to become lifelong learners (Singham 2005:9). It is clear that helping students develop these kinds of “socially responsive” intellectual skills is essential in South Africa’s current context, which requires adaptability, sophisticated knowledge, and problem-solving capacities. It is important to note that thinking skills are the serve and volley to thinking’s tennis.

SL activities help students to reflect on complex problems and to bring their experiences to bear on these puzzles, helping them move toward the ability to make well-reasoned decisions in the face of doubt (Hurd 2006:Online). SL experiences have also been found to enhance students’ creativity, as the experiences often require students to apply their knowledge to achieve given outcomes in unfamiliar situations and settings that lack resources.

Nokes, Nickitas, Keida and Neville (2005:Online) performed a study involving nursing students. The purpose was to explore whether participation in SL made a difference in students’ critical thinking, cultural competence, and civic engagement. Two student groups were involved: one group participated in SL, the other did not. Results of paired t-tests ($n = 14$) found that, after the intervention, critical-thinking scores measured by the California Critical Thinking Disposition Inventory were significantly lower ($t = -2.23$, $p = 0.04$) in the group that did not participate in SL. This was primarily influenced by the self-confidence subscale with a t-test score of 2.29 and a p -value of 0.039. Cultural competence measured by the Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals was significantly lower in the group that did not participate in SL ($t = 4.83$, $p = 0.000$). Civic engagement scores had increased significantly after the SL experience ($t = -3.54$, $p = 0.004$).

In a study by Goldberg and Coufal (2009:42) entitled *Reflections on SL, Critical Thinking, and Cultural Competence*, reflective journals and the Watson-Glaser Critical Thinking Appraisal tool (Watson & Glaser 2002:Online) were used. Fourth- and fifth-year communication sciences and disorder students were evaluated pre- and post-intervention to assess critical thinking. It was found that there were minimal differences between the

two groups, with p -values pre- and post-intervention of 0.5 and 0.52 respectively. The descriptive journals of over half the fourth-year students documented increased ability to cross socioeconomic and cultural boundaries and to make more refined moral judgments. In this study the SL experiences resulted in students raising relevant questions and exhibiting openness to contradictory ideas, i.e., students' own biases against their experiences with different populations.

2.9.4.1 *The Watson-Glaser Critical Thinking appraisal tool*

For the purposes of this study, the Watson-Glaser critical thinking appraisal tool (Watson & Glaser 2002:Online) was adapted to articulate more effectively for the field of specialisation and objectives of the study.

The tool consists of five different tests:

An **inference test** is a conclusion that someone can draw from certain observed or supposed facts. The condition T indicates that the students felt that the inference is definitely TRUE; that it properly follows beyond a reasonable doubt from the statement of facts given; PT if, in light of the facts given, the students thought the inference is PROBABLY TRUE; that it was more likely to be true than false. For ID, students decided that there was INSUFFICIENT DATA; that that they could not tell from the facts given whether the inference is likely to be true or false, and PF if, in light of the facts given, students thought the inference was PROBABLY FALSE; that it was more likely to be false than true. F indicates that students believed that the inference is definitely FALSE.

In the **assumption test**, an assumption is something presupposed or actual. If students felt that the given assumption is actual, in the statement, they marked YES under Assumption made. If they felt the assumption was not necessarily actual, in the statement they marked NO.

In the **deduction test**, each exercise consists of several statements (premises) followed by several suggested conclusions. For the purpose of this test, students considered the statements in each exercise as true without exception. Students had to read the first conclusion beneath the statements. If they thought it necessarily followed from the statements given, they marked YES. If students thought it was not a necessary conclusion from the statements given, they marked NO.

For the **interpretation test**, students had to judge whether each of the proposed conclusions logically followed beyond a reasonable doubt from the information given in the paragraph.

In the **evaluation test** students had to distinguish between arguments that are strong and arguments that are weak, as far as the question involved was concerned. For an argument to be strong, it must be both important and directly related to the question/statement (Watson & Glaser 2002:Online).

The tests of the Watson-Glaser Critical Thinking Appraisal tool that are discussed include all the critical-thinking skills identified by Beyer (1987:27) mentioned in Section 2.9.4.

2.9.5 Reciprocity in service-learning

Reciprocity is often discussed in the literature as a key element of SL. Reciprocity is illustrated by all parties involved functioning as both teacher and learner; without this relationship there is the risk of exploitation of both the community and the student (Donahue, Bowyer & Rosenberg 2003:17). One party alone does not hold all the power in the relationship, rather there is an effort by all to increase power for all parties involved. Donahue *et al.* believe that the constant interplay between giving and receiving, between teaching and learning, is at the heart of reciprocity in SL. The purpose of Donahue *et al.*'s study was to assist the educators to help their students to value reciprocal SL, and the researchers found that the participants were able to get "beyond identities" and move "towards affinities" (Donahue *et al.* 2003:17), since they had valuable knowledge to share.

Hurd (2006:Online) is of the opinion that SL encapsulates models of active learning that promote student involvement and participation. Active learning places strong emphasis on dialogue and deliberation as primary modes of teaching and learning. SL includes activities and resources that draw from and build upon students' own experiences, creative ideas, and "funds of knowledge" to increase and diversify the intellectual resources available to all students. It also brings to the surface assumptions, values, beliefs, and feelings that shape (and sometimes limit) students' responses to new learning. Instructional approaches typically focus on active learning and include participatory lectures, full-class and small-group discussions, student-led panels and debates. SL provides ongoing opportunities for structured reflection that link students' service experiences to ELOs, specific outcomes, graduate skills, and objectives of the

course (Hurd 2006:Online). Through reflection (Section 2.9.1) the connection between the service provided and the curriculum is achieved.

Hurd (2006:Online) adds that, by confronting problems in complex natural contexts, SL courses help students develop deeper understanding of subject matter, and a practical knowledge of strategies for transferring knowledge and problem-solving skills to new situations. SL's purpose, planning and rollout should be structured to use service and civic engagement to integrate and enhance academic learning, but does not replace academic learning. SL should combine content-driven, outcomes-based commitments with ample opportunity for learning and knowledge to grow from students' service experiences through all the different stages of execution (Hurd 2006:Online).

To achieve reciprocity between the persons providing and receiving service, effective SL represents a harmonised partnership between the campus and the community partner. It is thus important that the facilitator scaffolds the experience in accordance with the educational agenda and community contact person, thereby ensuring that the intervention meets the identified community need. In this study, this was achieved during Visit 1, the "meet and greet" (cf. Section 3.3.2). In following these steps, SL demonstrates reciprocity between the campus and the community, with each giving and receiving, each teaching and learning.

Students also benefit from the way SL informs the discipline or profession's knowledge base. As mentioned earlier, SL enables students to engage in collaborative research and in this way strengthening their academic learning and civic competencies. This reciprocal relationship benefits the profession, the students as learners, and members of the community as participants and recipients of information.

The above paragraphs link reciprocity to academic learning and the development of soft skills, on the other hand Bringle and Hatcher (2005:27) believe that SL does not necessarily produce academic learning. This issue will be debated in Section 7.3.5 of this document.

2.9.6 Methodology and philosophy for service-learning

Different institutions (CUT and UFS), different scholars (Bringle & Hatcher and Harkavy & Hartley) and different organisations (ASLER and CHESP) have created their own

philosophies and methodologies for SL. In literature there is a great deal of evidence to the methodology and philosophy of SL and in this abundance of theory, there also is minimal coherent theory. The starting point to attain the overall goal (cf. Section 1.4) of this study, it was essential to delve into the epistemology, ethnology and ontology, the *fons et origo* of SL. Though community involvement by higher-education institutions is governed by legislation (cf. Section 2.3) and though CE activities has dramatically increased over the last two decades, Benjamin Franklin published a pamphlet as long ago as 1749 entitled, *Relating to the Education of Youth in Pennsylvania* (Harkavy & Hartley 2010:419). In this document Franklin states:

The idea of what is *true merit*, should often be presented to youth, explain'd and impress'd on their minds, as consisting in an *Inclination* join'd with an *Ability* to serve mankind, one's country, Friends and Family ... which *Ability* should be the great *Aim* and *End* of all learning.

Approximately 150 years later, the University of Wisconsin's declaration "the boundaries of the university ... the boundaries of the state" already sprouted the idea of the pluriversity (cf. Section 1.2.2). In the 19 hundreds Dewey asked, "What attitude should I adopt to an issue which concerns many persons whom I do not know personally, but whose actions along with mine will determine the conditions under which we all live." Dewey (1938:20) inferred that the most powerful learning occurs when significant problems are examined, reflected, and acted upon in their rich contextual complexities. Dewey was vague, not suggesting any activities, groups or organisations to engage with, but he implicitly stressed the importance of dissolved dualism. His declaration that service "is general social advancement, constructive social reform, not merely doing something kind for individuals who are rendered helpless" contextualises the idea of *true merit* and social justice. According to Harkavy and Hartley (2010:420), the term service-learning was first used by Oak Ridge Associated Universities for a project on branch development.

Yet another definition for SL (compare to the definition by Bringle and Hatcher (1995:112), Section 2.3), this time attributed to Sheffield (2005:46) in his discussion piece, *Service in Service-Learning Education: the Need for Philosophical Understanding*, reads as follows:

Service-Learning provides the opportunity to apply classroom-developed knowledge

and skills to a community problem thereby increasing the depth and understanding of that knowledge and skill while solving a community problem through interaction with diverse community stakeholders.

Sheffield continues by stating that SL is a pedagogy rooted in the conception of progressive, pragmatic constructivism. The pedagogy of SL is thus an explicit attempt to use education as a means of promoting social justice and encouraging students to become active contributors to citizenship. This derails the perception that “what students choose to do with their knowledge is their own affair” (Harkavy & Hartley 2010:420). SL is a discipline-specific interaction and the application of the attributes indicated in the various definitions of SL should thus be contextualised. Different institutions have different SL philosophies and strategies (cf. CUT Philosophy of CE, Section 2.4.1) that relate to the unique values and standards of its academe and local community.

Institutionally institutions should lay down the groundwork for effective SL though the consultation and creation of a philosophy, strategies and support structures for SL (cf. Sections 2.4 and 2.5) within the context of the current higher-education environment (cf. Section 2.3). This rethinking of teaching practices and community involvement moves away from the silo towards an intersected model of the roles of an educational institution. This reinvention requires the institution to be susceptible to influences from its surroundings; achieving solidarity in diversity and allowing uni- to become pluroversity.

Important factors for getting academics involved in SL are the roles and rewards as well as the connection of these factors to the institutional mission and the needs of the local community (Heffernan 2001:2). Possible hindrances to academics becoming involved in SL revolve around, first, time and pressures of teaching and research, and administrative load. Performance and appraisal systems also promote excellence in these areas and, to a lesser extent, in CE. At the CUT this is manifested by academic and research awards in multiple categories while only one award was made for CE. Second, academics themselves resist change because SL “de-centers” the classroom, and the community and its needs are placed centrally to teaching and learning (Heffernan 2001:2). This rethinking of the class takes into account that cognitive, affective and moral growth is inseparable; it is the first step of developing critical thinking, participatory members of society that will be ethically accountable and socially responsible. Third, inadequate institutional support for academics involved in SL which can include funding, training and resource allocation. SL development differs at different institutions, governed by the

institutions' perceptions of their role in the community, and their definition of scholarship and professionalism, including the graduate qualities it advocates.

In designing a SL module, care should be taken to make sure that the engagement is placed at the centre of Fruco's model of distinction between services: both community and students benefit and both service and learning is emphasised. SL must be defined (cf. Section 2.7); thereafter the most appropriate model of SL should be selected:

Pure SL (volunteerism): Service to the community by students form the intellectual core of the engagement. It is regarded by some as "lightweight" because the content of the course is the service.

Discipline-based SL: Service to the community is related to course content and students reflect on the experience through analysis and improved understanding. The problem with this model is that, due to its strong link to the discipline, it limits the type and variety of interactions.

Problem-based SL: Service to the community can be referred to as a consultancy, where students use their knowledge to analyse, advise and thus address community needs. Problem-based SL can be limited in interaction and thus have the possibility of having limited impact and creating a paternalistic relationship, where students are perceived as experts.

Undergraduate community-based action research: Service to the community is connected to a community research project, allowing students to acquire research-methodology skills, in addition to other skills.

Depending on its context, most disciplines' SL is a combination of the first three models of SL and action research takes on a lesser role. *Capstone courses* and *service internships* can also be regarded as forms of SL, but in Radiography, this type of interaction is suited more to WIL (Heffernan 2001:4).

Fundamental questions around SL teaching and learning relate to theory, pedagogy, reflection, academic culture, student development, assessment, and curriculum development, and should include questions of promotion and tenure (Heffernan 2001:5). Not mentioned in the previous list of questions are the partnerships between all

stakeholders, as illustrated CHESP's triad partnership model (cf. Section 2.7). Consultation and discussion will lead to accurate identification of problems, clarification of roles, goal setting, evaluation and the realisation of benefits. Buy-in and ownership by all parties are essential to effective, successful, sustainable and mutually beneficial relationships and interactions.

Frameworks of development associated with SL can be classified under the human capital approach, the human rights approach and the human capability approach (Leslie 2010:24). The human capital approach requires investment in education to develop the human capacity necessary to drive economic growth. In this instance reference is made to the democratisation of communities and an increase in their political rights, leading to economic growth. Keep in mind that economic growth itself cannot be regarded as an indication of development. The human rights approach rests on the argument that education should assist the individual to access knowledge and thereby add value to human life. Here the researcher is talking about minimising ignorance about, for instance, health and social services that will consequently lead to exposure to other human needs areas. The feasibility and realisation of knowledge transfer is unfortunately hindered by legislation and institutional capacity. The human capacity approach sees education as a means to help communities to make choices and thereby create an enabling environment. For the majority of the South African population this enabling environment through freedom of choice is an insurmountable problem because of the purposeful socio-economic engineering associated with the legacy of Apartheid. The consequence of social exclusion is demonstrated by the overwhelming social ills prevalent in SA (Leslie 2010:26). It thus stands to reason that, although all sections of society should benefit from SL, there are certain communities that specifically need to be targeted by SL interventions.

In this research project community is defined by geographic spread (purposeful sample selection) and level of education (Grade 12 learners). This definition of community is broadened by the notion that the Grade 12 learners would act as agents and spread the information that they have received. There is no clear definition of community in literature, which in the view of the researcher is a good thing, since it opens more possibilities, and the only criterion for being a community is to have a commonality between members.

2.10 CONCLUSION

This literature chapter is, first, an advocacy of *pedagogical regression* through community engagement; second, it is a call to create a holistic “pluroversity” approach to education. In relation to Radiography at the CUT, this chapter provided the reader with background of teaching and learning practices used during SL. In view of the overall goal and objectives of the study Chapter 2 also provided the general characteristics and benefits of SL. Similarities and differences between Radiography WIL and SL were presented, as was current and previously completed SL research. The chapter concludes by providing the literature foundation to develop a methodology and philosophy for SL in Radiography.

From the literature discussed in this chapter, the benefits of SL should be clear. Franklin’s philosophy forms the basis from which all other characteristics, methods and benefits of SL flows. It is the opinion of the researcher that this flow does not always happen if one does the morally correct thing by applying the broad strokes provided in this chapter. Achieving reciprocity is an example of this: in this chapter different authors attempt to define reciprocity, but context is never included. Clear guidance through the establishment of a framework can provide the detail necessary for mutual beneficiation. A step-by-step guide to the planning, collaboration, implementation and evaluation of SL is therefore needed to provide the pixelated fines of detail as prescribed by the “pluroversity”.

In Chapter 3, Research design and methodology, the different methods of data collection, research sample and sampling and statistical analysis used during the study will be presented.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

In order to achieve the overall goal and related objectives of the study it is important to discuss the theoretical orientation and research design of the study. The research design used for this study was a mixed method research design and the manner and extent of the integration of different types of data will be addressed in this chapter. The different methods of data collection used during the study will be discussed, motivated and validated. The research sample and sampling will be described and statistical analysis that was used during the study will be reported on. The final part of this chapter will discuss ethical issues applicable to this study and the concepts of validity, reliability and trustworthiness.

What is research? Why do we do research? The word research has its origins in French, meaning to "search back" (Manoharan 2010:1). Mustafa (2010:1) dissects the word according to its syllables, "re" and "search", meaning to search again. In an academic sense, research involves a scientific and systematic search for pertinent information on a specific topic (Mustafa 2010:1). Webster's Online Dictionary defines research as a "Diligent inquiry or examination in seeking facts or principles; laborious or continued search after truth; as, researches of human wisdom; it creates new knowledge" (Webster's Online Dictionary 1998:Online).

Some people define research in a less formal way; in the words of the artist Talib Kweli (West, Kweli & Stephens 2004:Online): "Life is a beautiful struggle, some people using their noodle; some people using their muscle, some people make it fit like a puzzle." The amazing thing about research is that it opens our eyes to what was there all along. Bushberg, Seibert, Leidholdt and Boone (2012:iv), muse, "There has been an alarming increase in the number of things I know nothing about."

Whatever one perceives research to be, an important aspect of research is to assisting others, not only to create their own metaphorical puzzles, but also to challenge current knowledge. One way in which this can be achieved is by open sourcing the strategies, activities and instruments used during the research process and thereby creating an

information flow. This fluency also resonates with this research project, which analyses and adapts methods and tools from related studies of the past.

In *The Structure of Scientific Revolutions*, Kuhn (1996:23) declares that the nature of normal science is such that the (research) paradigm, in its standard application, functions by permitting the replication of research, which implies the promise of success, but which could also modify or replace research ideas and thereby strengthen the research methodology of SL.

3.2 THEORETICAL ORIENTATION OF THE RESEARCH DESIGN

Puzzle solving does not merely create the picture printed on the box. In investigating the nature of SL, the image formed by the use of scattered, abstract pieces could result in a better, more original picture than the promised end result (Kuhn 1996:38). As indicated earlier and discussed further in Section 3.2.1, a mixed method research approach was used during this study. Using proven research tools such as the Watson-Glaser Critical Thinking Appraisal tool as well as tools pioneered specifically for the purpose of this study, the study included both quantitative and qualitative approaches and can thus be characterised as a mixed method approach. Paradigm mixing took place throughout the research process. This did not happen in phases, but concurrently during all research activities.

3.2.1 Mixed method approach

Mixed method research is a research design with philosophical assumptions and methods of inquiry (Cresswell & Plano Clark 2006:5). In this study philosophical assumptions guided by the research questions (Section 1.3) and methods of enquiry directed the collection and analysis of data and the mixture of qualitative and quantitative approaches. Mixed method research allowed the researcher carte blanche to use various methods to address the research questions. This combination of methods provided more comprehensive evidence for answering the research questions than either quantitative or qualitative research could provide alone (Cresswell & Plano Clark 2006:9). The overall goal of this study was achieved by combining datasets, and this could not have been achieved by either approach alone. A mixed method approach provided a better understanding of the philosophy and methodology of Radiography SL.

It was important that the study design resonated with the objectives of the study. Quantitative and qualitative research approaches operate on different levels. According to Van Leent (in Mouton & Marais 1991:159) these levels include breadth and height dimensions. Breadth is involved when the researcher describes phenomena as they manifest in reality. Height is characterised by systematic construction of theory arising from empirical facts that were derived from consecutive levels of abstraction. The breadth dimension refers to recording studies; the height dimension demands experimental design, whereas endeavours to locate the essence of a phenomenon can be regarded as being qualitative approaches (Mouton & Marais 1991:159).

A quantitative study design, as described by Mouton and Marais (1991:159), is more specific than a qualitative study, and more explicitly controlled. Each participant's feedback is studied in the same way, thereby minimising bias that could lead to problematic data. Quantitative research is based on intent, where the results are more readily analysed and interpreted (Manoharan 2010:13). Roger Bacon (1214-1294), who had been trained in logic and natural philosophy and who placed considerable emphasis on the study of nature through empirical methods, was the first person to use the term empiricism (Mustafa 2010:1).

In this study, empirical data was collected from the Grade 12 rubrics, the contact person rubrics, and the Watson-Glaser Critical Thinking Appraisal tool. The data was used to investigate outcomes related to the achievement of graduate attributes, specifically critical thinking and benefits to society. Since these research instruments aim to gain insight into a situation, a community and in some cases individuals the study can also be classified as exploratory (De Vos, Strydom, Fouché and Delport 2012:95). Exploratory research is conducted to provide a better understanding of a situation using direct observations, interviews, and audio recordings.

A qualitative approach is a way of gaining insight through the discovery of meanings, by improving our comprehension of the whole. It aims to explore the richness, depth, and complexity of a phenomenon. Qualitative research can be defined as "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss & Corbin in Neill 2006:Online). Qualitative studies are tools used to understand and describe the world of human experience. As a qualitative research technique, ethnography can be defined as a study of the sociology of meaning through close field observation of sociocultural phenomena. Typically, the ethnographer

focuses on a community (Neill 2006:Online).

In this study, the researcher considered both the Grade 12 population and contact persons as representatives of the broader community. Radiography students were thus the engaging a more academically orientated community. Answers to the open-ended questions in the Radiography students' reflections and information from the semi-structured interview with Radiography facilitators provided the qualitative information. This phenomenological approach as clarified by Mustafa (2010:53) allowed the researcher to take a closer look at individual students' interpretation of their SL experiences. Trends were categorised and views were transcribed, analysed and interpreted.

The three distinct methodologies illustrated in Figure 3.1 used to gather, analyse and interpret the data were used to address the research objectives, ultimately leading to the achievement of the overall goal of the study. Quantitative and qualitative data were combined; the manner and the depth to which the study used this mixed method approach of merging, connecting and embedding will be discussed in the following sections.

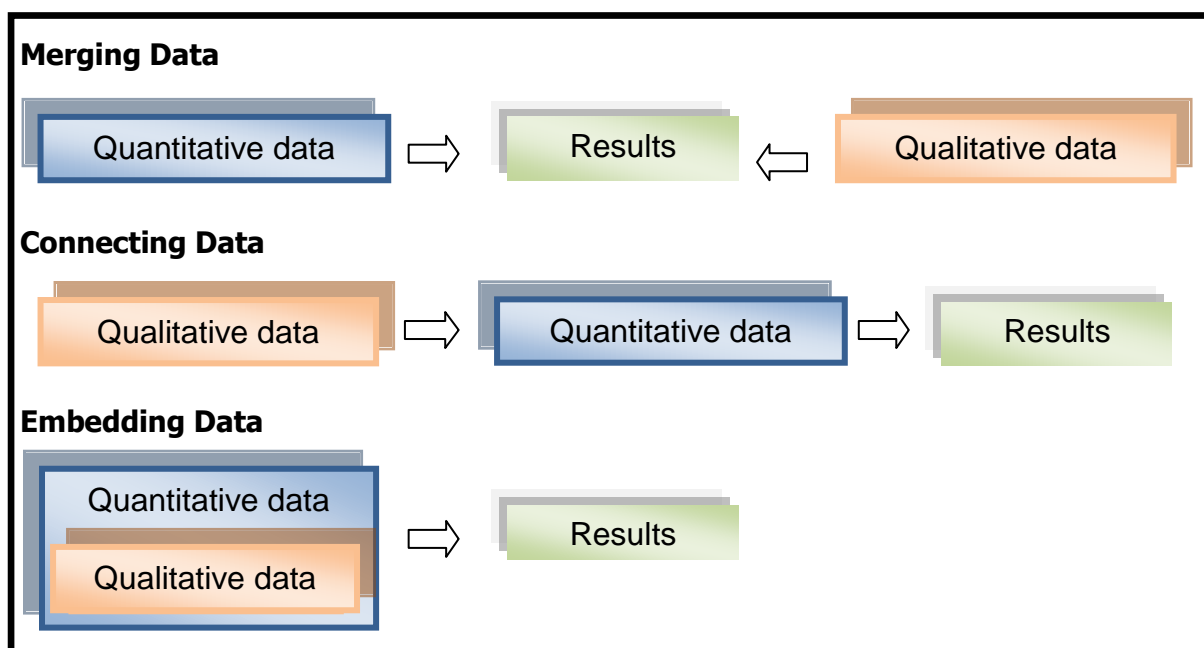


FIGURE 3.1: DIFFERENT WAYS OF COMBINING DATA IN THE MIXED METHOD DESIGN USED IN THIS STUDY (ADAPTED FROM CRESSWELL & PLANO CLARK 2006:7)

The application of each method within the context of the objectives and overall goal of this study is also discussed.

3.2.1.1 *Merging data*

Quantitative data collected from the Grade 12 rubrics and the contact person rubrics provided empirical data related to the achievement of graduate skills and benefits to society. Delegates attending the International Society for Exploring Teaching and Learning (ISETL) conference in San Antonio, Texas, in 2012 provided quantitative information related to graduate attribute skills, including benefits to society, student personal growth and reciprocity. Qualitative information about graduate attributes was gathered from semi-structured interviews with Radiography facilitators from the University of Johannesburg (UJ), Tswane University of Technology (TUT) and Cape Peninsula University of Technology (CPUT). Questions included benefit to society, student personal growth and reciprocity (discussed later in this chapter) were used to seek correlation with the aforementioned quantitative findings. The open-ended questions answered in Radiography students' reflections and class discussions provided qualitative information related to academic reciprocity, personal growth and social responsibility.

By merging the abovementioned data sets, the researcher aimed to seek a high degree of trustworthiness through triangulation.

3.2.1.2 *Connecting data*

Quantitative data were created from the qualitative data themes derived from the Radiography students' reflections and class discussions, including the semi-structured interviews, Grade 12 rubrics and contact person rubrics. Cresswell and Plano Clark caution that, in mixed method research, quantitative and qualitative data should not only be collected and analysed. They advise that these data sets need to be mixed in a manner that provides a more complete picture than the data would if standing alone (Cresswell & Plano Clark 2006:7).

3.2.1.3 *Embedding data*

As stated in Section 3.2.1.1, the Grade 12 learner and contact person rubrics provided empirical data. Further, Grade 12 respondents and contact persons were requested to clarify certain quantitative information they provided. This procedure was facilitated by the open-ended questions asking for explanations of quantitative data provided and requesting suggestions for ways in which future visits could be improved. These

questions thus provide the supporting role, as coined by Creswell and Plano Clark (2006:7).

3.3 RESEARCH METHODS AND PROCEDURES

In order to contextualise the research methods and procedures used during in this study the reader is reminded of the overall goal and objectives, as stated in Section 1.4:

- To establish whether the community benefits from Radiography SL;
- To establish whether SL cultivates social responsiveness in students;
- To investigate the effectiveness of SL in allowing students to achieve the graduate attributes;
- To establish specifically whether SL cultivates critical thinking in students;
- To analyse whether reciprocity is achievable when doing SL in Radiography; and
- To compare the significance of and correlation between the datasets of the different schools, contact persons, Radiography students and the different year groups using a 95% confidence interval.

3.3.1 Service-learning planning

The development of effective and appropriate SL activities relates to the intended purpose of SL. The SL programme should facilitate structured activities to help students achieve the intended purpose of SL. The specific SL activity should negate other settings or activities that might assist students to achieve these goals. Assessment of these activities and student performance in the activities should be incorporated in the SL programme.

From a community perspective, their service needs have to be incorporated into the SL plan. Are students offered the opportunity to make a difference? SL offers an opportunity for students and community members to come together and to learn from each other. Pure academic reciprocity may elude resource-based specialised disciplines, but SL does develop generic attributes, and promotes personal growth, social growth and intellectual growth in students (Duckenfield & Swanson 1992:6). While one solution may not fit all needs, SL is an ideal way to meet the ever-changing needs of students, communities, and service providers.

SL should be used as a teaching and learning method with senior students since they

have a broader knowledge base and are more mature learners than junior students. Students' experience and maturity are important factors for attaining success in SL; students must be challenged but not overwhelmed by the SL experience. Students should be given sufficient responsibility to make a difference. Important questions that must be answered in relation to students engaged in communities are, Are they mature enough to handle the responsibilities they are given? How will they be prepared for the specific tasks they will perform? Do the activities enhance the students' classroom skills? How will they be guided throughout their service experiences, and by whom? (Karasik, Maddox & Wallingford 2004:Online).

From the university's point of view, questions to be considered with regard to forming community partnerships include the following: Were the school's student friendly? Did the schools have the resources (e.g., space, time, staff) to accommodate students? What, specifically, could the students provide for the community? Could the school accommodate the number of students rendering the service? Through regular interaction with community contact persons at the different schools, strong partnerships were established. Consequently, resources were made available and the information sessions with the Grade 12 learners were encouraged by schools (Karasik *et al.* 2004:Online).

When Radiography SL was introduced at the CUT, students were orientated to, among other matters, the purpose of the interaction. Students were sent out as agents to identify problems in their communities of origin. This was an important step, because SL experiences must not only be relevant to the academic course of study; the service must also be identified as a need by the community, rather than the service being imposed on them by outsiders (Ross & Deverell 2004:287). The feedback of students was used to engage with community members (teachers at schools) about possible interactions. The matter was also discussed with the FSDoH, which would eventually become the project's service provider.

Discussions with students, the FSDoH and community representatives identified that there are sections of the community that do not know about medical imaging and the associated services provided by the FSDoH. It was consequently decided to focus on medical imaging and the service structure of the FSDoH. It was also decided that the interaction should include preventive information related to breast cancer and mammography, issues surrounding mother and foetal health (obstetric ultrasound) and bone health and bone densitometry. At least two of the chosen topics, x-rays and

ultrasound, articulated well with the Grade 12 Natural Science curriculum.

Successive cohorts of third-year Radiography students at the CUT have been engaged in SL at rural schools since 2008. Due to logistical problems community partners were established in closer proximity to the CUT in 2010. The study was conducted over two years of engagement with five schools which is important since SL should develop sustainable relationships with the communities that are involved in the interaction.

Communities were provided with a written description of the purpose of SL activities, which also set out what partners were supposed to achieve with SL. The envisaged outcome of the engagement is to improve overall community health and to enhance the learning process. Other important points relate to time frames, procedures for dealing with possible problems, and outcomes for the community. During the first site visit these aspects were clarified and, where necessary, amended.

3.3.2 Scaffolding the service-learning experience

Specific academic outcomes were drafted from the learning units of two modules, namely, Clinical Radiographic Practice III and Radiation Science III. The third-year Radiography students were divided into five groups and each group was allocated a community—one of the five participating secondary schools each. These schools were Brebner High School, Dr. Blok Secondary School, St. Bernard's High School, Sand du Plessis High School and Tsoseletso High School. Each group visited their community three times during the academic year. The first visited involved a "meet and greet":

- To introduce the new students to their contact person;
- To discuss the previous year's intervention;
- To address possible issues arising from the previous year;
- To adjust the outcomes;
- To discuss the planned intervention;
- To do a needs (resource) analysis; and
- To correlate the CUT's timeframes with the schools' calendar.

During the second visit, in the second term, students had to achieve outcomes related to medical imaging and associated services in the region, and breast cancer (mammography). The needs of our service provider, the FSDoH, were addressed through

the spreading of the aforementioned information. The outcomes of the final visit, which took place in the third term, were on obstetric ultrasound and bone health (bone densitometry).

Learning activities were scaffolded into different activities, including orientation, preparation, intervention and reflection.

Activity 1 (Orientation–facilitator)

The facilitator:

- a) introduced and discussed the principles of SL;
- b) discussed the purpose of SL;
- c) explained the partnerships involved;
- d) discussed the process to be followed;
- e) discussed ethical issues and professionalism during interactions with the community;
and
- f) introduced the outcomes to be addressed.

Activity 2 (Preparation–students)

Student groups had to:

- a) discuss the type of intervention that will address all the outcomes;
- b) determine the different responsibilities of a group;
- c) set up a time frame;
- d) conduct an analysis of resources required and suggest how shortcomings would be addressed;
- e) compile a mind map (Appendix C) of the project, indicating the different elements contributing to the final product;
- f) conduct Site visit 1 and discuss the programme with a identified community member, updating him/her on the process and resources available; and
- g) create the intervention.

Activity 3 (Execution–students)

Student groups had to:

- a) contact the identified community member and update him/her on the process, formalise appointment (date and time), and provide feedback on resources; and
- b) visit their sites and engage by means of their interventions.

Activity 4 (Reflective practice–students and facilitator)

Student groups had to:

- a) complete the critical-thinking questionnaire of the SL experience;
- b) complete the structured reflection of their SL experiences;
- c) participate in the reflection discussion of their SL experience; and
- d) readjust in preparation of the next intervention.

Grade 12 learners were explicitly instructed that it was their responsibility to spread the information gained among their families, peers and other community members.

Sections 3.3.3 to 3.3.9 discuss the research tools that were used to address the objectives of the study. All research tools and associated documents were only available in English because all participants understood and were able to express themselves in English. The study period was for the 2012-2013 academic years.

3.3.3 Grade 12 rubric: Graduate skills and community enhancement

In this study the student groups addressed the SL outcomes by preparing and executing dramatised presentations. Invitations to participate in the research project were issued to the Free State Department of Education (Appendix D) as well as the five identified schools (Appendix E). The conditions related to consent specified in this document allows for consent to be provided by the school and in the case of this study, specifically by the contact person at each school. Grade 12 learners at each school evaluated the presentations and the usefulness of the information using a rubric (Appendix F). The first part of the rubric involved an assessment of the presentations and thus indirectly some of the graduate attribute skills. The second part of the rubric was intended to evaluate the SL from a community enhancement point of view. Grade 12 learners also had to specify whether they benefitted from this intervention. The information sheet (Appendix G)

provided more detail on the research project and was discussed with Grade 12 learners.

3.3.4 Contact person rubric: Graduate attributes and community enhancement

In every case the contact person was one of the teachers at the school. Appendix H, the school consent form, was completed by the contact person in his/her capacity as representative of the school. In this study the contact persons at each school evaluated the presentations and the usefulness of the information using the questionnaire in Appendix I, the contact person rubric. The first part of the rubric involved an assessment of the graduate attribute skills and the second part an evaluation of the presentation. The third part of the rubric was used to evaluate the SL from a community enhancement point of view. Finally, the contact person had to indicate whether he/she and the Grade 12 learners benefitted from this experience.

3.3.5 Facilitator rubric: Knowledge outcomes assessment

The Radiography facilitator's assessment rubric (Appendix J) evaluated whether students addressed all the outcomes in their presentations. A four-point Likert scale was used to determine the degree to which students achieved the SL outcomes.

3.3.6 Radiography facilitator semi-structured interview: Service-learning enhancement

During a meeting of the annual Radiography Education Discussion (RED) group, Radiography facilitators from tertiary institutions other than the CUT were requested to complete a questionnaire on the use of SL as a facilitation method (Appendix K). Invitations to participate in the research project were issued to institutions involved in SL (Appendix L). The facilitators completed Appendix M, the Radiography facilitator consent form. During the study a semi structured interview (Appendix N) was used to gauge facilitators' experiences with SL in relation to the objectives of the study.

3.3.7 ISELT conference delegates' feedback

Feedback on the questions in Appendix O was given by delegates attending the ISETL conference in 2012. All participants facilitated SL modules at their different institutions;

participants were informed of the background and objectives of the study and they provided consent. One delegate from Chaminade University (Hawaii), three from University of Cincinnati and one from University of Central Oklahoma completed the questionnaire. Participants had to give feedback regarding their experiences of SL. Appendix O was compiled using the questions of the semi-structured interviews involving the Radiography facilitators from other South African institutions.

3.3.8 Reflection and discussion

Hatcher and Bringle (1997:Online) define reflection as the intentional consideration of an experience that is tied to learning objectives for a course. The few attempts that have been made to measure the quality of SL suggests that quality matters and, in these instances, reflection is a tool for improving quality (Eyler 2002:521).

3.3.8.1 Reflection schedule

Observations need to be continually processed, challenged, and connected with other information (Eyler 2002:522). This is especially important because students visited their respective schools three times during the academic year and presented twice during the three visits. In the following section the importance of reflection during service and reflection at the end of service is considered.

Reflection during service

If reflection does not happen after the first presentation, students will engage with the community during the second presentation with the same assumptions and operate and respond in the same manner (Eyler 2002:522). SL rests on a cyclical process of action and reflection on that action. Reflection assists students to acquire the skills and attitudes needed to evaluate their own professional practice and to contextualise their roles within broader society. Another important reason why reflection is important during SL is that reflection is immediate and focuses on the development and conceptualisation of learning throughout the experience (Wellington & Austin 1996:307-316). These characteristics and requirements of reflection are discussed in more detail in Section 2.9.1

Reflection at the end of SL

After the second presentation, reflection provides students with an opportunity to examine their understanding and to consolidate learning. As discussed in Section 2.9.1 and according to Bringle and Hatcher (2005:28) it is important that SL reflection should be conducted *throughout* the rollout of a course, at strategic times, and in a manner that demonstrates growth over time (all visits completed). Cameron *et al.* (2011:378) are of the opinion that reflection in SL encourages active learning and the development of critical-thinking skills, which happen over time. In addition to promoting the aforementioned, reflection at the end of SL changed students' orientation to learning.

3.3.8.2 Reflection and discussion during this study

Appendix P is an invitation to Radiography students to participate in the study. Radiography students completed the students' consent form, Appendix Q. After the second and third SL interventions individual student groups participated in a reflection exercise and discussion to articulate their experiences and to address some of the objectives of the study (for guidelines and reflection rubric see Appendices R and S).

The scheduling of the third-year Radiography programme at the CUT comprises of alternate weeks of formal classes and WIL. Substantive responses were required to the questions posed in the rubric during the week post intervention (which is a WIL work week). During the next week (a class week), interactive group reflection discussion amongst the group members was facilitated by the researcher. The questions of the reflection rubric were adapted from Zlotkowski in HEQF (2006:74) and Laplante (2007:231). When students discuss their experiences with others also engaged in SL in an informal, less academic setting—as in this study—more compelling information and arguments are yielded. The questions were structured to analyse the SL experience from an academic and enhancement domain as well as from a social responsibility and personal-growth domain. The final section of the rubric relates to the SL orientation and the management of the process.

3.3.9 Critical thinking

After the second and third SL visits individual students completed the Watson- Glaser Critical Thinking Appraisal tool (Watson & Glaser 2002:1-13) (Appendix T &

memorandum, Appendix U). The statements were structured to address the objectives of the study. The effect of SL on critical thinking was assessed by comparing the Watson-Glaser Critical Thinking Appraisal tool results of Visit 2 to that of Visit 3.

With its focus on community involvement, reflection and civil engagement, SL could improve students' critical-thinking abilities. Furthermore, SL should contribute to students' intellectual development and cultural competence (Goldberg & Coufal 2009:42).

3.3.10 A philosophy and methodology for service-learning in Radiography

The overall goal of the study (Section 1.41), namely, to develop a philosophy and methodology for SL in Radiography, was addressed by using information gathered from the various rubrics used. The data collected throughout the study period were continually reviewed to build theory that is grounded in the data (Mustafa, 2010:53). Using these grounded theories, it is intended that findings can be generalised to other Radiography programmes. Reflective data and semi-structured interview information were integrated and cross-referenced to attain this goal. The study was conducted over two years, with each year involving different participants (cf. Section 3.4).

3.4 SAMPLE SELECTION

To address the objectives of the study a variety of research tools were used. The purpose of using different tools was to achieve trustworthiness, since different tools were used on different samples of the population. The sections below describe the target population and sample size, give a description of the sample and in some instances the pilot study and, finally, the data-collection method followed during the study.

3.4.1 Grade 12 rubric – Graduate attributes and community enhancement

3.4.1.1 *Target population*

The target population refers to a group of individuals who possess and share certain specified characteristics (De Vos *et al.* 1998:14). From the title of this study it is clear that the intended beneficiary of Radiography SL is the Mangaung community. Not only did the Grade 12 learners represent the wider community (different ethnic and socio-economic backgrounds) of the Mangaung area but their purpose in this exercise was to act as information agents.

3.4.1.2 *Sample size*

The number of Grade 12 learners varied at the different schools. At most schools it was mostly the science class learners who were involved; this was the case at Brebner, Dr. Blok, St. Bernard's, and Tsoseletso. Because the total Grade 12 cohort at Sand du Plessis was very small, it was decided to involve the entire group of Grade 12 learners in the school. Taking an average of 30 Grade 12 learners per school, the final sample size was estimated at 600 (cf. Sections 4.4.2 & 4.4.3).

3.4.1.3 *Description of sample*

Grade 12 learners at five purposefully selected secondary schools in the Mangaung area during the period 2012–2013 formed part of this study. The chosen schools represent a wide geographical spread within the Mangaung area to negate the perception that SL only targets previously disadvantaged communities. Two of the topics covered in the SL intervention forms part of the Grade 12 Natural Science curriculum: x-rays and ultrasound.

3.4.1.4 *Pilot study*

The Grade 12 rubric has been piloted since 2008. A pilot study (Appendix V—an extended abstract of the pilot was published in *African Journal of Health Professions Education* in December 2009) was done during the first year of SL to determine how the intervention could be improved (Botha 2009:19). Third-year Radiography students prepared and executed dramatised presentations, Grade 12 learners evaluated the presentations using a rubric. Evidence from the Grade 12 assessments indicated that the presentations and slide shows were perceived as excellent, being awarded an average point of 81.35%. In evaluating the content, Grade 12 learners assigned a percentage of 77.8%, indicating that the information was new, useful and empowering (they would be able to tell others about it).

3.4.1.5 *Data collection*

Grade 12 rubrics were completed during Site Visits 2 and 3 directly after the presentations. The researcher explained the rubric and the process to the Grade 12 learners. All the rubrics were collected after completion.

3.4.2 Contact person rubric: Graduate attributes and community enhancement

3.4.2.1 *Target population*

As explained in Section 3.4.1.1, the wider Mangaung community is the intended beneficiary. By completing this rubric the contact person at each school thus represented the wider community of the Mangaung area.

3.4.2.2 *Sample size*

Since five schools were involved in the research project, feedback from five contact persons was used, and over the study period this would have equalled 20 samplings. Unfortunately during two visits the contact person was not available giving us a total sample size of 18.

3.4.2.3 *Description of sample*

The contact person at each of the participating schools can be described as a community member, and also as a knowledgeable collaborator. They assisted in the evaluation of community enhancement, presentations and graduate attributes.

3.4.2.4 *Pilot study*

The contact person rubric has been piloted since 2008. During the pilot study mentioned in Section 3.4.1.4 (Botha 2009:19), contact persons at three schools evaluated the presentations using a rubric. The contact persons ($n=3$) indicated that the presentations and slide shows were excellent, awarding an average of 84.8%. The contact persons awarded an average of 78.6% for content: they found the information new, useful and empowering.

3.4.2.5 *Data collection*

Contact person rubrics were completed during Site Visits 2 and 3 directly after the presentations. The researcher explained the rubric and the process to the contact persons. All rubrics were collected after completion.

3.4.3 Facilitator rubric: Knowledge outcomes assessment

The purpose of this rubric was to establish whether students addressed all the specific SL outcomes for Site Visits 2 and 3. The rubric was completed by the researcher.

3.4.3.1 *Pilot study*

The Radiography facilitator rubric has been piloted since 2008. In relation to the pilot study mentioned in Section 3.4.1.4 (Botha 2009:19), the facilitator had to judge whether all the specific outcomes had been achieved. The average rating in this instance was 94.67%.

3.4.4 Radiography facilitator semi-structured interview: Service-learning enhancement

3.4.4.1 *Target population*

The overall goal of the study is to establish a philosophy and methodology for SL in resource-based disciplines and academic programmes like Radiography. A methodology for SL will assist in the planning, rollout and management of the SL process.

3.4.4.2 *Sample size*

The RED group feedback indicates that only three institutions were involved in SL during 2011. The semi-structured interviews were conducted during 2013.

In addition, five delegates attending the ISETL conference in 2012 formed part of the sample.

3.4.4.3 *Description of sample*

Academic personnel at other institutions involved in Radiography SL as described by Bringle and Hatcher (1996:222) during the study period formed the sample.

3.4.4.4 *Data collection*

Meetings were arranged with participating facilitators during the annual RED group meeting. The researcher visited two institutions, UJ and TUT, to conduct the interviews. Both interviews were recorded using an Olympus® VN-6500PC digital voice recorder after the participants granted permission. Skype® was used to conduct the interview with the facilitator from Cape Peninsula University of Technology and again the interview was recorded. The recordings were independently transcribed (professional typist) and verified by the promoter of this study.

Feedback on the questions in Appendix O given by delegates attending the ISETL conference in 2012 was collected by the researcher during the conference.

3.4.5 Reflection and discussion

3.4.5.1 *Target population*

Not many Radiography programmes in SA currently involve SL. This study would either validate or discredit SL as a means of developing students' perspectives of and interaction with the broader community. It was important to determine how this interaction between students and the community affects the curriculum. The purpose of the reflection was to find out if benefits, like student social responsiveness and academic reciprocity, promised by SL, could be achieved.

3.4.5.2 *Sample size*

For the academic year 2012, 25 students were registered for their final year of study in Radiography; for the academic year 2013, 43 students were registered. In total, the student sample size was 68 students.

3.4.5.3 *Description of sample*

All final-year Radiography students registered for the academic years 2012–2013 at the CUT who are at the exit level, formed part of this research project.

3.4.5.4 *Pilot study*

The questions in the reflection rubric were piloted in the form of a structured reflection rubric since 2008. The Radiography students completed a structured reflection during the pilot study. Data from the students' reflection reports indicate that the interventions were experienced positively: students could reinforce previous knowledge and be more involved in own knowledge creation, and teamwork was excellent. SL seemed to be a meaningful experience; however, the study could not establish whether curriculum-changing reciprocity was achieved.

3.4.5.5 *Data collection*

Students completed the reflections after Visits 2 and 3. Since the questionnaires were completed in class, the researcher collected them after completion. In reference to the reflection discussions, these were recorded after the participants granted permission. The recordings were independently transcribed (professional typist) and verified by the promoter of this study.

3.4.6 *Critical thinking*

3.4.6.1 *Target population*

The overall goal of the study was to establish a philosophy and methodology for SL in resource-based disciplines and academic programmes like Radiography. As indicated in Section 3.3.4.1 not many Radiography programmes are currently doing SL. The study would indicate the degree to which SL develops critical thinking in students.

3.4.6.2 *Sample size*

As stated in Section 3.4.5.2 the total student sample size was 68 students.

3.4.6.3 *Description of sample*

All final-year Radiography students registered for the academic years 2012–2013 at the CUT who are at the exit level, formed part of this research project.

3.4.6.4 *Pilot study*

The Watson-Glaser Critical Thinking Appraisal tool was piloted in class before Site Visit 2. The necessary adaptations were completed before the first presentations.

3.4.6.5 *Data collection*

Students completed the Watson-Glaser Critical Thinking Appraisal tool after Visits 2 and 3. As with the reflection, it was completed in class, and the researcher collected the rubrics after completion.

3.5 DATA ANALYSIS

During this research project both descriptive and inferential statistics were used. Descriptive statistics described the basic features of the data in a study, what is or what the data shows. The Department of Biostatistics, Faculty of Health Science at the UFS analysed the data that was presented to them by the researcher in MS Excel spreadsheet format. Results were summarised by frequencies and percentages (categorical variables) and means, standard deviations and percentiles (numerical variables). The results of the outcomes were analysed using 95% confidence intervals for differences in percentage, mean and median. The concepts of correlation and significance were also tested.

With inferential statistics, the purpose is to reach conclusions that extend beyond the immediate data alone. Inferential statistics is used to make inferences from data to more general conditions (Trochim 2006:Online).

3.5.1 Grade 12 rubric: Graduate skills and community enhancement

For the quality of the presentations, average percentages were calculated. Average percentages were also be calculated in relation to community enhancement. Responses for the different year groups were also tested for significance and correlation.

3.5.2 Contact person rubric: Graduate skills and community beneficitation

By using a 4-point Likert scale the degree to which graduate attribute skills were achieved by students was evaluated. In relation to the quality of the presentations, averages were

calculated. Average percentages were also calculated in relation to community beneficiation. Responses by the different years of the study duration were tested.

3.5.3 Facilitator rubric: Knowledge outcomes assessment

A 4-point Likert scale was used to evaluate the degree to which specific outcomes were achieved by students.

3.5.4 Radiography facilitator semi-structured interview: Service-learning beneficiation

Feedback from participants (including ISETL delegates) were categorised and trends were established by using basic counts and averages. Correlation between the data sets of the different facilitators was evaluated.

3.5.5 Reflection and discussion

Feedback from participants were grouped under social responsiveness and reciprocity and within these groups, categorised. Trends were established by using basic counts and averages. Responses of the different years of the study duration were also tested for correlation

3.5.6 Critical thinking

First, the Watson-Glaser Critical Thinking Appraisal tool and a 4-point Likert scale were structured to assess the degree to which SL influenced the critical thinking and critical-thinking development in students. Responses of the different years of the study duration were tested for significance and correlation.

3.6 ETHICS

3.6.1 Permission

Permission to execute the study was obtained from the Faculty of Health Sciences Research Committee of the UFS (Appendix W). This protocol was also submitted to a biostatistician for evaluation of the viability of the study (Appendix X). Permission to conduct the project in schools was obtained from the Free State Department of Education

(Appendix D). An invitation to participate was issued to the headmasters of five selected secondary schools in the Mangaung municipal area (Appendix E). The selection of the schools was purposeful and was based on geographical location, so that the study could have a broader impact. This type of selection also serves to address the perception that only disadvantaged communities are engaged with SL. Facilitators from tertiary institutions other than the CUT involved in SL were informed of the research project via the RED group, which meets annually.

3.6.2 Ethical approval

No patient data was used or any experimentation on live subjects or tissue monsters was done. Approval for conducting the research project was obtained from the Ethics Committee of the Faculty of Health Sciences (UFS) under ECUFS Number 117/2012 (Appendix Y). Ethics was additionally granted by the different SA institutions involved in the study (Appendix Y).

3.6.3 Informed consent

Appendix F, the information sheet, was used in conjunction with discussion sessions to inform all participants of the study: Radiography students, Grade 12 learners, community contact persons and facilitators from other institutions. Participants were asked to complete the informed consent form (Appendices H, M and Q), which stated, amongst others, that,

- the information provided on the information sheet had been explained to participants by the researcher;
- participants understood what was expected of them;
- participants consented to participate in the study;
- participants declared that they were participating of their own free will; and
- there was no remuneration involved.

3.7 QUALITY ASSURANCE MEASURES

The **validity** of a research instrument is the extent to which it measures what it was intended to measure (Leedy & Ormrod 2010:28). In structuring the research tools used in this research project, it was important to ensure that there is articulation between the tools and the objectives of the study. Care was thus taken to structure the questions,

sentences and statements.

Some of the instruments used (Grade 12 rubric, contact person rubric, facilitator rubric, and the structured reflection) were piloted to ensure valid answers to the research questions posed in this study. This ensured that the test, in fact, measures what was intended, and not something else altogether (Leedy & Ormrod 2010:29).

Reliability, on the other hand, is an indication of the consistency with which a measuring instrument provides a certain result (Leedy & Ormrod 2010:29). An instrument that measures psychological phenomena tends to be less reliable than one measuring physical phenomena. Accuracy of data is achieved by consistent measurement. Yet, measuring something consistently does not necessarily mean the measurements are accurate: reliability is a necessary but insufficient condition for validity (Leedy & Ormrod 2010:29). The combination, integration and linking of the different data discussed in Section 3.2.1 strengthens the validity and reliability of this study. The reflection discussions post-intervention, and the semi-structured interviews, during which voice recordings were used (permission was obtained), assisted in validating and refining the data obtained by the various rubrics and reflections.

Active participation in the SL interventions, active participation in data gathering and the debriefing of students by means of reflection discussions by the researcher also assisted in ensuring validity and reliability in this study.

Trustworthiness includes criteria such as credibility, applicability, dependability and conformability. *Credibility* is an evaluation of whether or not the research findings represent a “credible” conceptual interpretation of the data drawn from the participants’ original data (Fenton & Mazulewicz 2008:Online). Credibility was assured through triangulation. *Transferability* is the degree to which the findings of this inquiry can apply or transfer beyond the bounds of the project. Transferability was addressed by involving a variety of participant; different schools, different academic institutions, both nationally and internationally. *Dependability* is an assessment of the quality of the integrated processes of data collection, data analysis, and theory generation. Dependability was addressed through transcription, analysis and record keeping duration the research period. *Confirmability* means that the reader should be able to track data to the source; it is a measure of how well the inquiry’s findings are supported by the data collected. Confirmability was ensured by allowing access to raw data and making sure that the researcher acted in good faith and in doing so did not influence the results.

Trustworthiness deals with the degree of congruence of the data with reality (Shenton 2004:64). The following measures ensured the trustworthiness of the study: (a) The development of an early familiarity with participants; (b) Using methods pioneered by others in previous comparable projects (Watson-Glaser Critical Thinking Appraisal tool); (c) Tactics to help ensure honesty of data (discussions with groups to explain the process, voluntary participation); (d) Iterative questioning and frequent debriefing sessions; (e) Triangulation by using different methods of data collection; and (f) Using rich descriptions of the phenomena under scrutiny (Shenton 2004:64).

3.8 CONCLUSION

This chapter discussed the theoretical orientation and research design of the study. The manner and extent of the integration of different data were addressed. The different methods of data collection used during the study were discussed and motivated by comparison to previously completed research. The research sample and sampling were described; as was the statistical analysis conducted during the study. The final part of this chapter discussed ethical issues applicable to this study and the concepts of validity, reliability and trustworthiness.

In the following chapter the researcher will present, analyse, interpret and discuss the quantitative research findings of the different tools used to gather data.

CHAPTER 4

POSTULATE TO PRAXIS I

QUANTITATIVE RESULTS, DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 INTRODUCTION

The mixed method approach (discussed in Section 3.2.1) used in this study provided both quantitative and qualitative data. In this chapter the results, data analysis, interpretation and discussion of the quantitative data will be presented. The data were gathered from participating Grade 12 learner and contact person rubrics administered at Brebner High School, Dr Blok Secondary School, Sand du Plessis High, St. Bernard's College and Tsoseletso High School, all located in the greater Mangaung area. Also presented are the quantitative results from the Radiography facilitator outcomes assessment, the results of the Watson-Glaser Critical Thinking Appraisal tool, which had been completed by the Radiography students, and the feedback of delegates attending the 42nd ISETL conference. To facilitate easy reading, tables and graphs will be used to present some of the results.

The aforementioned results were analysed by the UFS's Faculty of Health Sciences, Department of Biostatistics. This analysis will be presented per group as set out in the previous section. The analysis will include comparisons related to correlation between data sets, including significance of differences between results. In some instances, graphs and tables will clarify comparisons and accentuate the relationships between the different data presented.

In Section 4.2, Figure 4.1 provides a schematic illustration of the way the results will be presented, analysed, interpreted and discussed.

4.2 SCHEMATIC OVERVIEW OF THE CHAPTER

The schematic overview of the chapter presented in Figure 4.1 serves to provide the reader with a layout and a synopsis of the chapter.

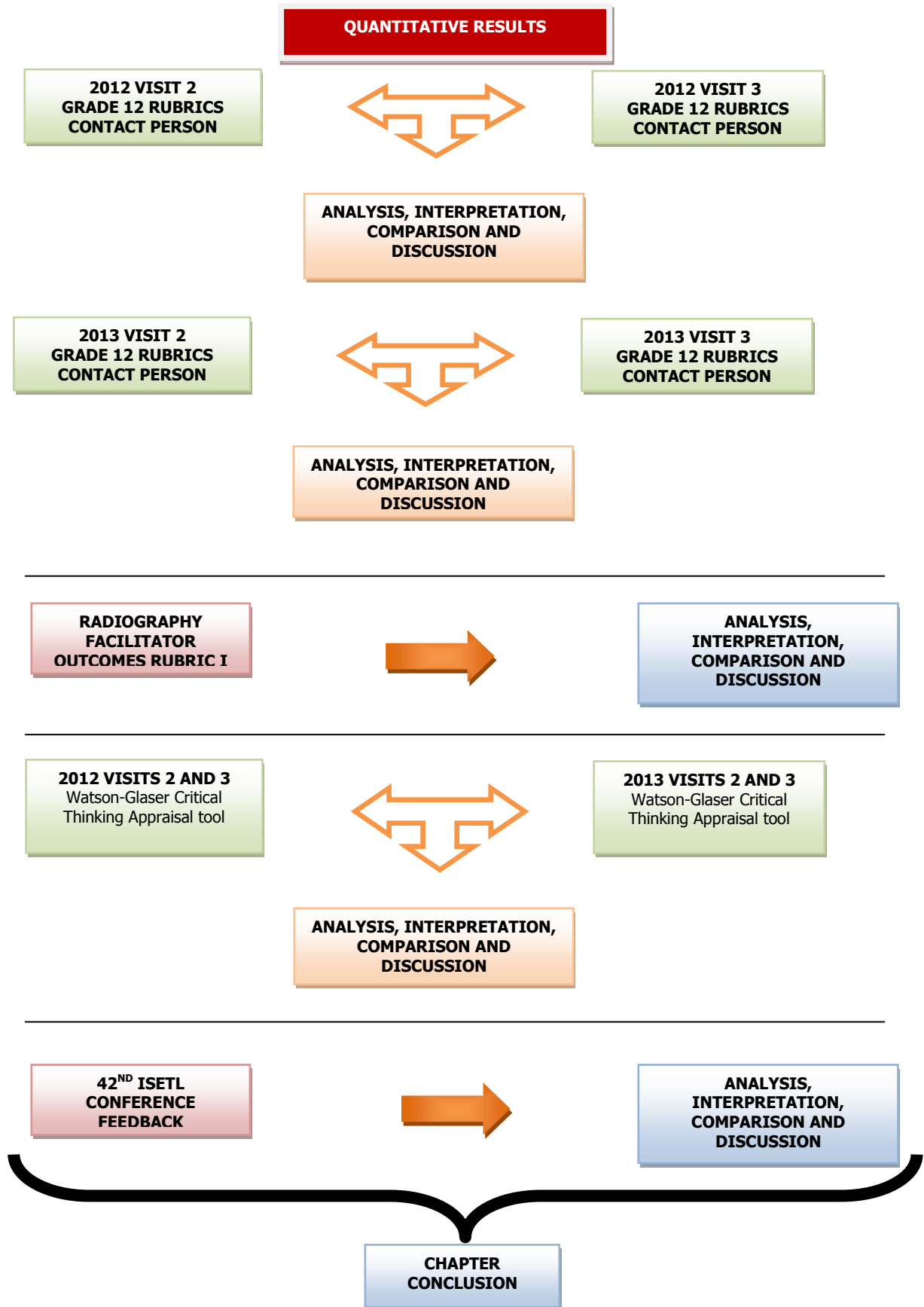


FIGURE 4.1: SCHEMATIC OVERVIEW OF CHAPTER 4
 (Compiled by the researcher, Botha 2013)

4.3 SUMMARY OF QUANTITATIVE DATA GATHERING

As discussed in Section 3.3.3, third-year Radiography students visited the five participating secondary schools three times during an academic year. During the second visit, which took place in the second term, and the third visit, during the third term, Grade 12 learners and the contact persons at each site evaluated the presentations using rubrics (Appendix F and I). Quantitative data relating to the achievement of specific learning outcomes were gathered from the Radiography facilitator rubrics.

After the second and third SL presentations Radiography students completed the Watson-Glaser Critical Thinking Appraisal tool (Watson & Glaser 2002:1-13) (Appendix T and memorandum, Appendix U). The effect of SL on the development of critical-thinking skills was assessed by comparing the Watson-Glaser Critical Thinking Appraisal tool results of Visit 3 to that of Visit 2.

Delegates attending the 42nd ISETL conference (2012), articulating their SL experiences by completed appendix O.

4.4 QUANTITATIVE RESULTS, ANALYSIS, INTERPRETATION AND DISCUSSION

The data gathered, as explained in Section 4.3, will be presented, analysed, interpreted and discussed in Sections 4.4.1-4.4.5.

4.4.1 Data analysis

The data analysis of the different data sets will be described in the following sections.

4.4.1.1 *Grade 12 rubric*

1. Differences between 2012 Visit 2 data and 2012 Visit 3 data
2. Differences between 2013 Visit 2 data and 2013 Visit 3 data

4.4.1.2 *Contact person rubric*

1. Differences between 2012 Visit 2 data and 2012 Visit 3 data
2. Differences between 2013 Visit 2 data and 2013 Visit 3 data.

4.4.1.3 *Watson-Glaser critical thinking appraisal tool*

1. Differences between 2012 Visit 2 overall marks (out of 46) and 2012 Visit 3 overall marks.
2. Differences between 2013 Visit 2 overall marks (out of 46) and 2013 Visit 3 overall marks.
3. Significance of differences between 2012 & 2013 (All) Visit 2 overall marks and 2012 & 2013 (All) Visit 3 overall marks.
4. Differences between 2012 and 2013 Visit 2 marks per subtest and 2012 and 2013 Visit 3 marks per subtest.

Subtests:

- Inference (out of 14)
- Assumption (out of 9)
- Deduction (out of 11)
- Interpretation (out of 6)
- Evaluation (out of 6)

4.4.1.4 *ISETL rubric*

1. Percentage feedback from conference delegates (n=5, making comparison of differences between different participants statistically less significant)

4.4.2 *Grade 12 assessments - 2012*

The quantitative part of the Grade 12 rubrics assessed the quality of the presentations and indirectly the graduate's attribute skills. In addition, the Grade 12 learners had to indicate the usefulness of the information they had received, and they were asked if they had benefitted from the intervention.

The rubric assessed the following research questions (Section 1.4.3) and associated objectives:

1. To establish whether the community benefits from Radiography SL
This objective addressed research question 1.

3. To investigate the effectiveness of SL in enabling students to achieve the graduate attributes

This objective addressed research question 3.

In relation to these objectives 183 Grade 12 learners completed rubrics during 2012's second visits and 117 Grade 12 learners completed rubrics during 2012's third visit. The decrease in numbers was because some schools felt that the Grade 12 science learners would benefit more and thus the sample became more specific.

4.4.2.1 Presentation-skills results

The presentation-skills results presented in this section addressed some of the graduate attribute skills.

Visit 2

One percent of the Grade 12 learners indicated that Radiography students were not systematic in their presentation; in reference to *Organisation*, 42.3% agreed that the sequence was logical and 55.7% said it was a logical, interesting sequence. For this category 1% used a notation of four, not provided as an option (n=97, 86 no responses). In relation to *Slides organised well*, 78.6% (n=182, 1 no response) specified that the slide shows were organised and well prepared, font size was correct and slides contained optimal information and no misspellings or grammatical errors, while 21.4% said that the slides had a logical layout, font size was too small or slides contained too much information and slides had two misspellings and/or grammatical errors. For *Body language & eye contact* 56.8% agreed that students reflected confidence most of the time, had one or two irritating habits during the presentation and occasionally used eye contact. For the same category 38.2% said that students reflected confidence all the time, had no irritating habits during the presentation, and made an effort to maintain eye contact most of the time. Only 5% indicated that students reflected little confidence, had irritating habits during the presentation and occasionally used eye contact. For the statement referring to *Voice clarity* 59% indicated that students' voices were clear, and students pronounced most words correctly. In this instance 31.7% said that students used clear voices and pronounced terms correctly and precisely, and 9.3% said students' voices were not loud enough and that students pronounced terms incorrectly.

For each of the statements in the rubric the highest evaluation of the options provided received more than 50% of the feedback.

Visit 3

Under *Organisation*, 50% of the Grade 12 learners indicated that students' presentation had a logical, interesting sequence and 50% agreed that the sequence was logical (n=40, 56 no responses). In relation to *Slides organised well*, 70.9% (n=117) the Grade 12's who strongly agreed specified that the slideshows were organised and well prepared, font size was correct and slides contained optimal information and no misspellings or grammatical errors,, strongly agreed while 29.1% said that the slides had a logical layout, font size was too small or slides contained too much information and slides had two misspellings and/or grammatical errors. For *Body language & eye contact* 55.6% reported that students reflected confidence most of the time, had one or two irritating habits during the presentation and occasionally used eye contact. For the same category 39.3% said that students reflected confidence all the time, had no irritating habits during the presentation, and made an effort to maintain eye contact most of the time. In contrast, 5,1% indicated that students reflected little confidence, had irritating habits during the presentation and occasionally used eye contact. For the statement referring to *Voice clarity* 51.3% indicated that students' voices were clear, and students pronounced most words correctly. In this instance 45.3% said that students used clear voices and correct and precise pronunciation of terms, and 3.4% said students' voices were not loud enough and that students pronounced terms incorrectly.

Again, for all the statements the highest evaluation of the options provided received more than 50%. The results indicate that students achieved the generic attributes by planning, preparing and executing presentations relevant to the community

If one compare 2012's Visit 2 to 2012's Visit 3 results, more Grade 12 learners strongly agreed that the presentation had a logical, interesting sequence during Visit 2. Similar findings were achieved for slide shows being organised and well prepared, font size being correct and slides containing optimal information and no misspellings or grammatical errors. In relation to students reflecting confidence all the time and lacking irritating habits, the results of Visits 2 and 3 were similar with an increase of 1.1% for Visit 3. The category with the highest positive change during Visit 3 was that students used clear voices, and pronounced terms correctly and precisely.

4.4.2.2 Community enhancement results

The community enhancement results presented in Section 4.4.2.2. involves an analysis of the value of the interaction from a personal point of view, and whether the interaction had a broader community beneficence element.

Visit 2

For *Content knowledge*, 0.5% of the Grade 12 learners indicated that they gained no new knowledge, 33% gained basic knowledge and 65% indicated that they gained comprehensive knowledge (n=182, one omission). For this category 0.5% used a notation of four, not provided as an option. When evaluating their *Level of understanding*, 1.1% of the Grade 12 learners indicated that they understood nothing, 66.5% understood some concepts and 32.4% indicated that they understood all concepts. In relation to *Level of usefulness* 1.7% of the Grade 12 learners indicated that they will not use information, 29.8% found certain aspects useful and 68% indicated that the information was valuable (n=181, two omissions). Again, 1.5 % used a notation of four, not provided as an option. For *Empowerment* 3.9% indicated that they would not tell others about information, 38.3% would tell others about some of the information and 57.8% indicated that they would tell others about all of the information.

Visit 3

For *Content knowledge*, 3.4% of the Grade 12 learners indicated that they gained no new knowledge, 34.2% gained basic knowledge and 63.4% indicated that they gained comprehensive knowledge (n=117). When evaluating their *Level of understanding*, 1.7% of the Grade 12 learners indicated that they understood nothing, 56.4% understood some concepts and 41.9% indicated that they understood all concepts. In relation to *Level of usefulness* 0.9% of the Grade 12 learners indicated that they will not use information, 34.8% found certain aspects useful and 64.3% indicated that the information was valuable (n=115). Under *Empowerment* 3.4% indicated that they would not tell others about information, 45.7% would tell others about some of the information and 50.9% indicated that they would tell others about all of the information.

From a community enhancement perspective more Grade 12 learners indicated that they gained comprehensive knowledge and that the information was valuable during the

second visit than during the third. The results may indicate the partners need to redefine the outcomes especially in relation to relevance. During Visit 3 more Grade 12 learners indicated that they understood all concepts and indicated that they will tell others about all some of the information presented than during Visit 2. More students indicated that they would inform others about all the information during Visit 3 thereby bringing the wider community into the fold.

4.4.2.3 Have you benefitted from this experience?

The responses of Grade 12 learners to this question addressed Objective 1: To establish whether the community benefits from Radiography SL.

Visit 2

When asked whether they feel that they benefitted from the experience, 96.2% of the Grade 12 learners said yes and 3.8% said that they did not. Figure 4.2 illustrates this result.

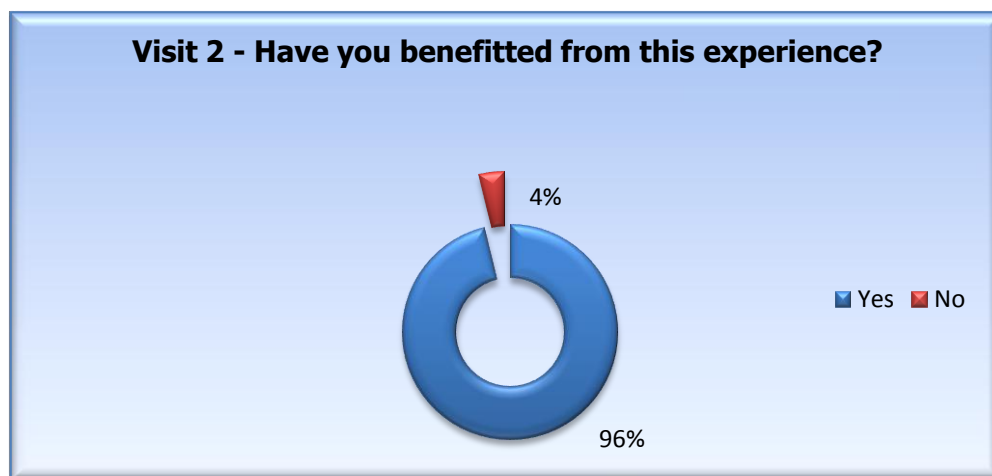


FIGURE 4.2: VISIT 2: FEEDBACK REGARDING GRADE 12 EXPERIENCE

Visit 3

When asked whether they feel that they benefitted from the experience after Visit 3, more of the Grade 12 learners (97.4%) said yes than after Visit 2, and 2.6% (fewer than after Visit 2) said that they did not.

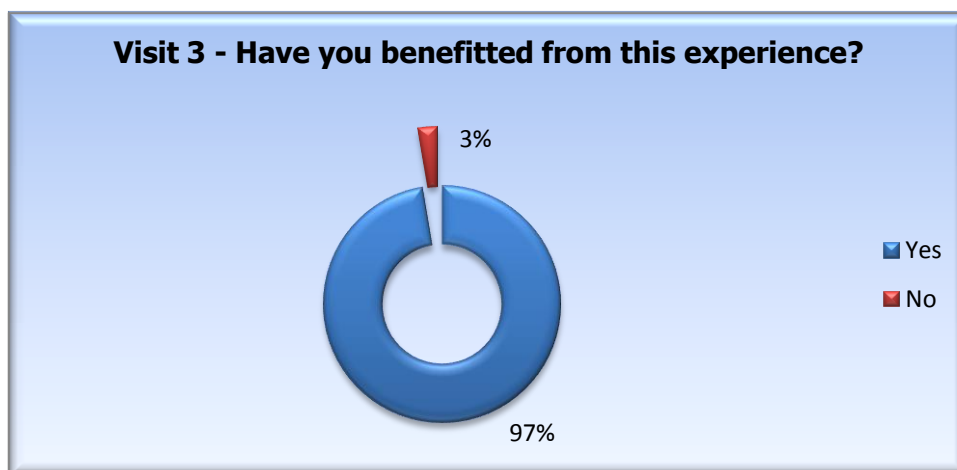


FIGURE 4.3: VISIT 3: FEEDBACK REGARDING GRADE 12 EXPERIENCE

Considering the Visit 2 and Visit 3 results separately, more Grade 12 learners indicated that they benefitted from the intervention when they answered research question one: Does engagement through Radiography SL facilitate the betterment of communities? The reason why Grade 12 learners felt this way will be discussed in Chapter 5, Sections 5.4.1 and 5.5.1, some of the reasons given are *Relevance*, *Informative* and *Valuable information*. There was a 1.2% increase in the number of learners who believed the intervention was to the benefit of communities from Visit 2 to Visit 3, indicating that Grade 12 experiences were the same.

4.4.3 Grade 12 assessments - 2013

In 2013, 207 Grade 12 learners completed rubrics during Visit 2, and 176 Grade 12 rubrics (only science learners) were completed during Visit 3.

4.4.3.1 Presentation-skills results

As in Section 4.4.2, the presentation skills results presented in Section 4.4.3.1 address some of the graduate attribute skills.

Visit 2

In reference to *Organisation* approximately three percent (2.92%) of the Grade 12 learners indicated that Radiography students' presentations were disorganised; 61.27% said that the sequence was logical and 35.78% said it was it was a logical, interesting

sequence. For this category there were 204 respondents, with three failing to respond. In relation to *Slides organised well*, 66.67% (n=207) reported that the slide shows were organised and well prepared, font size was correct and slides contained optimal information and no misspellings or grammatical errors, while 31.4% said that the slides had a logical layout, font size was too small or slides contained too much information, and slides had two misspellings and/or grammatical errors. The remaining 1.93% felt that the slides had no logical layout, font size was too small and slides contained too much information as well as three misspellings and/or grammatical errors. For *Body language & eye contact* (n=206) 23.79% said that students reflected confidence all the time, had no irritating habits during the presentation, and made an effort to maintain eye contact most of the time. For the same category 64.08% agreed that students reflected confidence most of the time, had one or two irritating habits during the presentation and occasionally used eye contact. On the other hand, 12.14% indicated that students reflected little confidence, had irritating habits during the presentation and occasionally used eye contact. For the statement in reference to *Voice clarity* (n=206) 59.22% indicated that students' voices were clear, and students pronounced most words correctly. In this instance 28.64% said that students used clear voices and pronounced terms correctly and precisely; 12.14% said students' voices were not loud enough and that students pronounced terms incorrectly.

Visit 3

Of the 176 Grade 12 learners who completed the rubric, with regard to *Organisation*, 48.3% indicated that students' presentations had a logical, interesting sequence, 48.86% agreed that the sequence was logical and 2.84% felt that students were disorganised. In relation to *Slides organised well*, 66.29% (n=175) specified that the slide shows were organised and well prepared, font size was correct and slides contained optimal information and no misspellings or grammatical errors, while 33.71% said that the slides had a logical layout, font size was too small or slides contained too much information and slides had two misspellings and/or grammatical errors. For *Body language & eye contact* 72.16% reported that students reflected confidence most of the time, had one or two irritating habits during the presentation and occasionally used eye contact. For the same category 19.32% said that students reflected confidence all the time, had no irritating habits during the presentation, and made an effort to maintain eye contact most of the time; 8.52% indicated that students reflected little confidence, had irritating habits during the presentation and occasionally used eye contact. For the statement referring to *Voice*

clarity, 61.93% indicated that students' voices were clear, and that students pronounced most words correctly. In this instance 32.39% said that students used clear voices and correct and precise pronunciation of terms; 5.68% said students' voices were not loud enough and that students pronounced terms incorrectly.

During Visit 3 more Grade 12 learners said the presentation had a logical, interesting sequence and that student used clear voices and correct and precise pronunciation of terms. More Grade 12 learners felt that the slideshows were organised and well prepared, font size was correct and slides contained optimal information and no misspellings or grammatical errors. The small increase from Visit 2 to Visit 3, of 0.38%, means that students' evaluation of *Slides organised well* showed no difference. Further, more Grade 12 learners said that students reflected confidence all the time and had no irritating habits during Visit 2.

In relation to visits in 2012 and 2013, students demonstrated the following graduate attributes, with most Grade12 learners either awarding a value of three or five (Appendix F):

Organisation referred to working effectively with others in the community, working effectively with others in the educational environment and managing oneself with respect to the educational environment and in a personal context. *Slides organised well* referred to using science and technology effectively. *Body language & eye contact* and *Voice clarity and pronunciation* indicated effective communication.

4.4.3.2 Community enhancement results

The community enhancement results presented in Tables 4.1 and 4.2 analyse the value of the interaction from a personal point of view as well as from a broader community beneficence perspective.

Visit 2

The feedback from Grade 12 learners for community enhancement during Visit 2 is presented in Table 4.1 on the next page.

TABLE 4.1: GRADE 12 LEARNERS' FEEDBACK FOR COMMUNITY ENHANCEMENT DURING VISIT 2

CONTENT KNOWLEDGE		LEVEL OF UNDERSTANDING		LEVEL OF USEFULNESS		EMPOWERMENT	
No new knowledge gained	2.9%	Understood nothing	3.38%	Will not use information	3.88%	Will not tell others about information	5.8%
I gained basic knowledge	42.51%	Understood some concepts	70.53%	Certain aspects useful	40.29%	Will tell others about some of the information	49.67%
I gained comprehensive knowledge	54.59%	Understood all concepts	26.09%	Valuable information	55.83%	Will tell others about all of the information	44.44%

Visit 3

The feedback from Grade 12 learners for community enhancement during Visit 3 is presented in Table 4.2.

TABLE 4.2: GRADE 12 LEARNERS' FEEDBACK FOR COMMUNITY ENHANCEMENT DURING VISIT 3

CONTENT KNOWLEDGE		LEVEL OF UNDERSTANDING		LEVEL OF USEFULNESS		EMPOWERMENT	
No new knowledge gained	2.84%	Understood nothing	1.71%	Will not use information	3.41%	Will not tell others about information	7.39%
I gained basic knowledge	40.34%	Understood some concepts	70.29%	Certain aspects useful	35.23%	Will tell others about some of the information	46.02%
I gained comprehensive knowledge	56.82%	Understood all concepts	28.0%	Valuable information	61.36%	Will tell others about all of the information	46.59%

From a community-enhancement perspective, more Grade 12 learners indicated that they gained comprehensive knowledge and that the information was valuable during the third visit than during the second. During Visit 3 more Grade 12 learners indicated that they understood all concepts and indicated that they would tell others about all of the information presented. Communities do benefit from Radiography SL.

4.4.3.3 *Have you benefitted from this experience?*

During Visit 3 responses by Grade 12 learners once again refer to Objective 1: To establish whether the community benefits from Radiography SL.

Visit 2

When asked whether they feel that they have benefitted from the experience, 91.04% of the Grade 12 learners said yes and 8.96% said that they did not. Figure 4.4 demonstrates this.

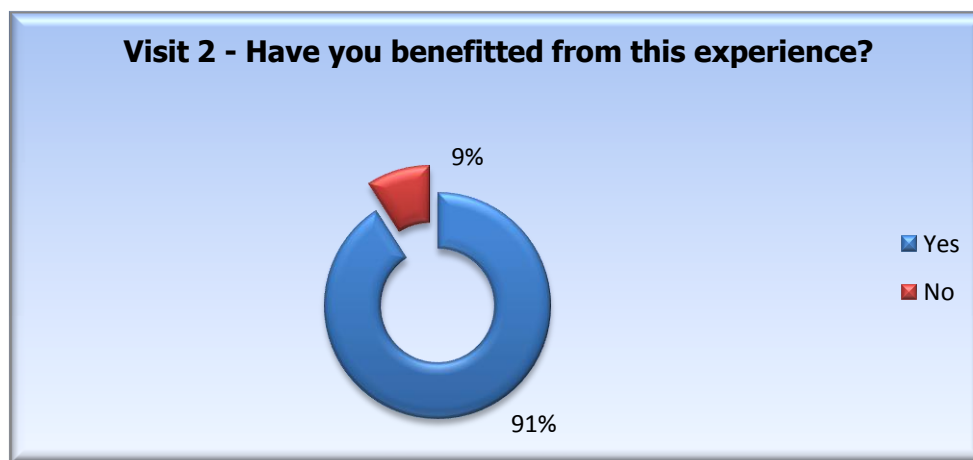


FIGURE 4.4: VISIT 2: FEEDBACK REGARDING GRADE 12 EXPERIENCE

Visit 3

When asked whether they feel that they have benefitted from the experience, 90.91% of the Grade 12 learners said yes and 9.09% said that they did not.

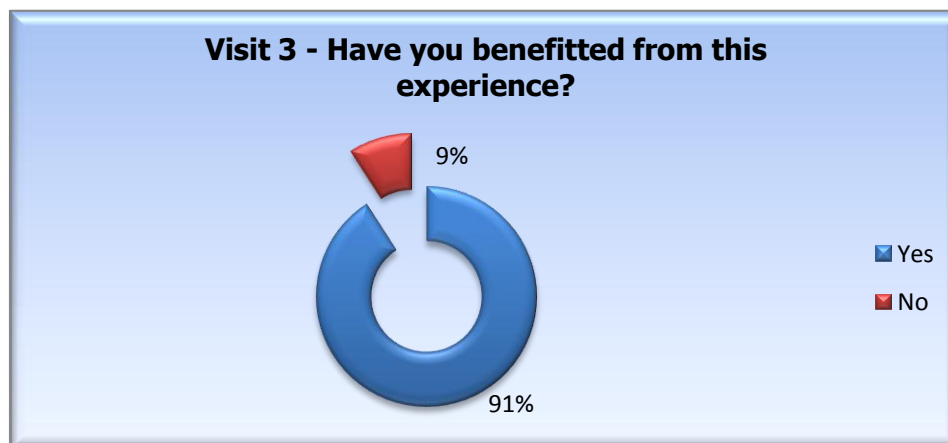


FIGURE 4.5: VISIT 3: FEEDBACK REGARDING GRADE 12 EXPERIENCE

Though it is not clear from Figures 4.4 and 4.5, more Grade 12 learners felt that they benefitted from the intervention during Visit 2. There was a 0.13% decrease between Visit 2 and Visit 3, again indicating that the Grade 12 experience remained the same. The reason why Grade 12 learners felt this way will be discussed in Chapter 5, Sections 5.4.1 and 5.5.1, some of which are *Explained well, I gained knowledge* and *To my advantage*. Since more Grade 12 learners felt that they benefitted from the intervention, it can be stated that engagement through Radiography SL facilitates the betterment of communities.

4.4.4 Contact-person assessments - 2012

The quantitative part of the contact person rubrics first and directly assessed whether students exhibited the graduate attribute skills; second, the presentations, and third, the usefulness of the information and whether Grade 12 learners and contact persons benefitted from the experience.

The purpose of this assessment by the contact persons at the five schools was to address the following research questions (Section 1.4.3) and associated objectives:

2. To establish whether the community benefits from Radiography SL
This objective addressed research question 1.
4. To investigate the effectiveness of SL in allowing students to achieve the graduate attributes
This objective addressed research question 3.

In relation to these objectives 10 samplings were estimated for 2012 (Section 3.4.2.2) because the five schools were each visited twice over the study period. For the second visits of both 2012 and 2013 five contact persons participated, giving a return rate of 100%. The return rate for the both third visits (2012 and 2013) was equal to 90% because on both occasions one of the five contact person was not available.

4.4.4.1 Graduate attribute skills results

In this assessment contact persons used the following key to select the answer that was in their opinion a true reflection of the SL intervention:

1. Strongly agree SA
2. Agree A
3. Disagree D
4. Strongly disagree SD

Visit 2

Of the feedback received 40% strongly agree that *Students display self-confidence*, 40% agreed and 20% disagreed. In relation to *Students displaying creativity and critical thinking skills*, one contact person did not give any feedback, with the tally of the remaining participants 75% (3) strongly agreeing and 25% (1) agreeing. Eighty percent strongly agreed that *Students were organised* and 20% agreed. Of the five contact persons, four (80%) strongly agreed and 1 (20%) disagreed that *Students function well as a group*. It is clear that contact persons thought *Students communicate effectively*, with 40% strongly agreeing and 60% agreeing with the statement. Sixty percent of participants strongly agreed that *Students used science and technology effectively*, and 40% agreed. In reference to *Students have a high level of information literacy*, one contact person did not give any feedback, with the remaining participants being spread evenly between strongly agreeing (50%) and agreeing (50%).

Visit 3

For this round of data collection only four contact persons participated and the results presented relates to a sample of four. Regarding feedback received there was a decrease from Visit 2, with 25% strongly agreeing that *Students display self-confidence*, and a greater number (75%) agreeing with the statement; in this round there was no disagreement like after Visit 2. In relation to *Students displaying creativity and critical thinking skills*, there was an even spread, with 50% strongly agreeing and 50% agreeing—Visit 2 had more contact persons strongly agreeing. More contact persons strongly agreed that *Students were organised*; for Visit 3 there was an even spread of 50% each for strongly agree and agreed. Of the four contact persons 50% strongly agreed and 50% agreed that *Students function well as a group*. During Visit 2 there were once again more contact persons who strongly agreed for this statement. According to 50% of the participants *Students communicate effectively*, with more strongly agreeing (more than Visit 2) and 50% agreeing with the statement. Seventy-five percent of participants strongly agreed that *Students used science and technology effectively* and 25% agreed.

All contact persons (100%) strongly agreed that *Students have a high level of information literacy*; this also represents an increase from Visit 2.

Though thorough comparison of Visit 2 and Visit 3 data is compromised due to the difference in sample size, it is important to note that, except for one contact person disagreeing with the statement *Students display self-confidence* during Visit 2, all other responses were either strongly agree or agree. Most of the contact persons were of the opinion that Radiography students displayed all the graduate attributes. The SL process is a learner-centred approach of self-discovery, but it also uses collaboration with others to assist personal development. The aforementioned affirmatively answers the research question: Does planning, preparation and interaction with the community through SL allow students to achieve the graduate attributes?

4.4.4.2 Presentation-skills results

Contact persons again used the same key as in Section 4.4.4.1 to select the answer that was in their opinion a true reflection of the SL intervention.

Visit 2

Forty percent of the contact persons strongly agreed that students' *Introduction & Conclusion orientated the audience clearly*, and 60% agreed. In relation to *Slides organised well, Optimal information, Font size correct*, 80% strongly agreed and 20% agreed. Eighty percent of participants strongly agreed that *Spelling & Grammar* was optimal and 20% agreed. For the statement in reference to *Elocution and voice clarity* 40% strongly agreed and 60% agreed that students were on par. Sixty percent of the contact persons felt that students *Pronounced terms correctly* and 40% agreed.

Visit 3

Fifty percent of the contact persons strongly agreed that students' *Introduction & Conclusion orientated the audience clearly* and 50% agreed. In relation to *Slides organised well, Optimal information, Font size correct*, 100% strongly agreed. Seventy-five percent of participants strongly agreed that *Spelling & Grammar* was optimal and 25% agreed. For the statement in reference to *Elocution and voice clarity* 25% strongly agreed

and 75% agreed that students were up to standard. Fifty percent of the contact persons felt that students *Pronounced terms correctly* and the other half agreed.

For both Visits 2 and 3 all the contact persons either strongly agreed or agreed that students' presentations were organised, slides were optimal and communication skills were effective. Students demonstrated mastery of the following graduate attributes: working effectively with others in the community, using science and technology effectively and effective communication.

4.4.4.3 Community enhancement results

The community enhancement results are presented in Sections 4.4.4.3. and 4.4.4.3. Again, as with the Grade 12 learners' rubrics, the value of the interaction is analysed from a personal point of view as well as from a broader community beneficence perspective.

Visit 2

For *Content knowledge*, 20% of the contact persons indicated that they gained basic knowledge and 80% indicated that they gained comprehensive knowledge. When evaluating their *Level of understanding*, 100% understood some of the concepts. Regarding the *Level of usefulness*, 100% of the contact persons were of the opinion that the information was valuable. Under *Empowerment*, 80% would tell others about all of the information and 20% would tell others about some of the information.

Visit 3

For *Content knowledge*, 25% of the contact persons indicated that they had gained basic knowledge and 75% indicated that they had gained comprehensive knowledge. When evaluating their *Level of understanding*, 50% understood some of the concepts and 50% understood all concepts. Under the *Level of usefulness*, 75% were of the opinion that the information was valuable and 25% indicated that certain aspects were useful. Under *Empowerment* 100% would tell others about all of the information.

Most of the feedback from the contact persons indicated that they gained comprehensive knowledge and most understood some of the concepts. Again, most of the contact persons felt that the information was valuable and that they were empowered. In post-

Apartheid SA access to services and community health are burning issues. Though Grade 12 learners and contact persons were used to gather the data to answer the research questions referred to in section 4.4.4, the interventions would have a broader impact as suggested earlier in section 3.2.1.

4.4.4.4 *Have you benefitted from this experience?*

Visit 2

All the participating contact persons (100%) felt that both themselves (*contact person*) and *Grade 12 learners* benefitted from the SL engagement.

Visit 3

All the participating contact persons (100%) felt that both they (*contact person*) and *Grade 12 learners* benefitted from the SL engagement.

Gredler (1992:2) states that SL provides benefits for both the individual and society; similarly the 2012 contact-person results indicate that communities do benefit from Radiography. Objective 1: To establish whether the community benefits from Radiography SL, was proven. Some of the reasons for this mentioned for this mentioned in section 5.6.1 are *Informative* and *Valuable information*.

4.4.5 Contact person assessments - 2013

The purpose of this assessment by the contact persons at the five schools was to address the research questions (Section 1.4.3) and associated objectives as mentioned in Section 4.4.4.

For the second visits (2013) the sample equals four, because the contact person at one of the schools was not available, giving a return rate of 90%. Similarly, the return rate for the third visits was equal to 90%.

4.4.5.1 Graduate attribute skills results

In this assessment contact persons used the key described in Section 4.4.4.1 to select the answer that was, in their opinion, a true reflection of the SL intervention.

Visit 2

Table 4.3 represents the results of the contact person evaluation of graduate attributes during Visit 2.

TABLE 4.3: CONTACT-PERSON EVALUATION OF GRADUATE ATTRIBUTES DURING VISIT 2

Graduate attributes	SA	A	D	SD
Students display self-confidence	25%	75%		
Students display creativity and critical-thinking skills (n=3)	33.3%	66.7%		
Students are organised	25%	75%		
Students function well as a group	50%	50%		
Students communicate effectively	25%	75%		
Students use science and technology effectively (n=3)	100%			
Students have a high level of information literacy (n=4)	100%			

Visit 3

Table 4.4 represents the results of the contact-person evaluation of graduate attributes during Visit 3.

TABLE 4.4: CONTACT-PERSON EVALUATION OF GRADUATE ATTRIBUTES DURING VISIT 3

Graduate attributes	SA	A	D	SD
Students display self-confidence	50%	50%		
Students display creativity and critical-thinking skills	50%	50%		
Students are organised	75%	25%		
Students function well as a group	50%	50%		
Students communicate effectively	25%	75%		
Students use science and technology effectively	50%	50%		
Students have a high level of information literacy	50%	50%		

From Tables 4.3 and 4.4 it is clear that all the feedback falls under either strongly agree or agree, thereby indicating that contact persons felt that students displayed the graduate attributes. The extent to which students displayed the graduate attributes is also clear from the feedback of strongly agree or agree. There was an increase in all the categories except for communications skills, which obtained and remained at the low value of 25% for strongly agree.

4.4.5.2 Presentation-skills results

Contact persons used the same key as in Section 4.4.4.1 to select the answer that was in their opinion a true reflection of the SL intervention.

Visit 2

The Visit 2 results for the students' presentation skills can be seen in Table 4.5 on the next page.

TABLE 4.5: CONTACT-PERSON FEEDBACK ON PRESENTATION SKILLS

POWERPOINT PRESENTATIONS				
	SA	A	D	SD
Introduction & conclusion orientated audience clearly (n=3)	33.3%	66.7%		
Slides organised well, Optimal information, Font size correct	100%			
Spelling & grammar: No spelling/grammatical errors	75%	25%		
Elocution: Clear voice	25%	75%		
Pronounced terms correctly.	25%	75%		

All the feedback falls under either strongly agree or agree. Contact persons agreed with Grade 12 learners that communication skills were a problem, because it had the lowest score under strongly agree. Further, only a third (n=3) of the contact persons strongly agreed that students' presentation organisation was up to standard.

Visit 3

The Visit 3 results for the students' presentation skills can be seen in Table 4.6.

TABLE 4.6: CONTACT-PERSON FEEDBACK ON PRESENTATION SKILLS

POWERPOINT PRESENTATIONS				
	SA	A	D	SD
Introduction & conclusion orientated audience clearly (n=3)	66.7%	33.3%		
Slides organised well, Optimal information, Font size correct	50%	50%		
Spelling & grammar: No spelling/grammatical errors	25%	75%		
Elocution: Clear voice	50%	50%		
Pronounced terms correctly	75%	25%		

As with Visit 2, all the feedback falls under either strongly agree or agree.

Students demonstrated the following graduate skills: *Organisation Introduction & Conclusion Orientate audience* referred to working effectively with others in the

community. *Slides organised well* and *Spelling and grammar* indicated that they used science and technology effectively, *Elocution*, *Voice clarity* and *pronunciation* indicated effective communication.

4.4.5.3 Community enhancement results

Visit 2

The feedback from the contact persons for community enhancement during Visit 2 are shown in Table 4.7.

TABLE 4.7: GRADE 12 FEEDBACK FOR COMMUNITY ENHANCEMENT DURING VISIT 2

CONTENT KNOWLEDGE		LEVEL OF UNDERSTANDING		LEVEL OF USEFULNESS		EMPOWERMENT	
No new knowledge gained	0%	Understood nothing	0%	Will not use information	0%	Will not tell others about information	0%
I gained basic knowledge	25%	Understood some concepts	50%	Certain aspects useful	25%	Will tell others about some of the information	25%
I gained comprehensive knowledge	75%	Understood all concepts	50%	Valuable information	75%	Will tell others about all of the information	75%

Visit 3

The feedback from the contact persons for community enhancement during Visit 3 are presented in Table 4.8.

TABLE 4.8: GRADE 12 FEEDBACK FOR COMMUNITY ENHANCEMENT DURING VISIT 2

CONTENT KNOWLEDGE		LEVEL OF UNDERSTANDING		LEVEL OF USEFULNESS		EMPOWERMENT	
No new knowledge gained	0%	Understood nothing	0%	Will not use information	0%	Will not tell others about information	0%
I gained basic knowledge	75%	Understood some concepts	50%	Certain aspects useful	0%	Will tell others about some of the information	25%
I gained comprehensive knowledge	25%	Understood all concepts	50%	Valuable information	100%	Will tell others about all of the information	75%

Most of the feedback from the contact persons after Visits 2 and 3 indicates that they gained comprehensive knowledge, and half of them understood all of the concepts, while the other half understood some. Again, most of the contact persons felt that the

information was valuable and that they will tell others about all the information; as can be seen in Tables 4.7 and 4.8. The results confirm Alperstein's (2007:59) statement that community members gain new knowledge as a result of SL. It can be stated that the SL intervention can place the community in a better position to improve their daily lives.

4.4.5.4 *Have you benefitted from this experience?*

Visit 2

All the participating contact persons (100%) felt that both they (*contact person*) and *Grade 12 learners* benefitted from the SL engagement.

Visit 3

All the participating contact persons (100%) felt that both they (*contact person*) and *Grade 12 learners* benefitted from the SL engagement.

As was the case during 2012, contact persons indicated that both they and the Grade 12 learners benefitted from the intervention. Since they indicated that they would tell others about the information (Tables 4.7 and 4.8), it can be postulated safely that the community benefitted from Radiography SL. Contact-person feedback affirmatively addresses the following objective: To establish whether the community benefits from Radiography SL. Some of the reasons given related to *Relevance* and *Educational*. The results additionally confirm Alperstein's (2007:59) statement that community members benefit from SL.

4.4.6 Radiography facilitator assessment

Using a 4-level Likert scale, the Radiography facilitator assessed whether students addressed all the specific learning outcomes in their presentations, and the degree to which students achieved this. Since there were different outcomes for the second and third visits, the results will be presented separately.

4.4.6.1 *Second visit outcomes assessment 2012 and 2013*

For Visit 2, 10 Radiography facilitator rubrics were completed, giving a return rate of 100%.

The following key was used provide answers that were, in the facilitator’s opinion, a true reflection of the SL intervention:

1. Strongly agree SA
2. Agree A
3. Disagree D
4. Strongly disagree SD

Table 4.9 shows the Visit 2 outcomes evaluation for 2012 and 2013. For the 10 evaluations of each of the 11 outcomes there were only two instances where the facilitator felt that the students did not reach the outcome. *Clarify medical imaging* and *Outline the service structure and service availability of the FSDoH* each had one disagree for each of the 10 evaluations.

TABLE 4.9: FACILITATOR EVALUATION OF LEARNING OUTCOMES FOR VISIT 2

OUTCOMES	SA	A	D	SD
Clarify medical imaging	90%		10%	
Discuss the interactions of x-rays with matter	70%	30%		
Explain radiation and radiation protection	70%	30%		
Outline the service structure and service availability of the FSDoH	50%	40%	10%	
Demonstrate mamma self-evaluation technique	80%	20%		
Identify the structures/anatomy of the breast on a drawing	60%	40%		
Recall indications for mammography	100%			
Explain the various mammographic projections	70%	30%		
Demonstrate knowledge of the compilation and functioning all mammography-imaging equipment	70%	30%		
Explain the important radiation considerations and effective protection during mammographic imaging	60%	40%		
Discuss the use of compression and magnification techniques	40%	60%		

Responses to all the outcomes were either strongly agree or agree, except for *Clarify medical imaging* and *Outline the service structure and service availability of the FSDoH*, where each had nine evaluations of either strongly agree or agree.

4.4.6.2 Third visit outcomes assessment 2012 and 2013

In this case 10 samplings (Visit 3’s at the five schools) provided a return rate of 100%. Once again the same key as indicated in Section 4.4.6.1 was used to evaluate the degree to which students achieved the outcomes of Visit 3, as can be seen in Table 4.10.

TABLE 4.10: FACILITATOR EVALUATION OF LEARNING OUTCOMES FOR VISIT 3

OUTCOMES	SA	A	D	SD
Outline the ultrasound service availability from the FSDoH	60%	40%		
Reflect on the ethical issues related to obstetric ultrasound examinations	70%	30%		
Recall indications for obstetric ultrasound	100%			
Discuss the various uses of ultrasound in obstetric sonography	100%			
Prepare a mock examination (demonstration)	90%	10%		
Discuss the <u>basic</u> physical principles of ultrasound	70%	30%		
Describe how 3D and 4D ultrasonic imaging is achieved	80%	20%		
Discuss the Doppler effect and the use thereof in medical imaging	80%	20%		
Describe the causes of bone mineral deficiency	100%			
Discuss the basic principles of DXA (different absorptions to get the measurements)	70%	30%		
Discuss the basic measurements used in DXA (BM measurements)	60%	30%	10%	

Table 4.10 shows the Visit 3 outcomes evaluation for 2012 and 2013. For the 10 evaluations of each of the 11 outcomes there was only one instance where the facilitator stated that the students failed to reach the outcome. *Discuss the basic measurements used in DXA (BM measurements)* had one disagree in 10 evaluations. All the other outcomes were rated either strongly agree or agree, with *Discuss the basic measurements used in DXA (BM measurements)* receiving nine evaluations of either strongly agree or agree.

Of the 10 groups evaluated during Visits 2 and 3 of 2012 one group were evaluated as not *Clarifying medical imaging* while another did not *outline the service structure and service availability of the FSDoH*. Except for the three mentioned groups that did not achieve one outcome each, all groups other met all the specific learning outcomes. Students feedback in reflection rubrics (Section 5.7.3) present reasons for differences discovered in other sources in comparison to the work done in class, but also indicated that it was not necessary to change the outcomes (Section 5.7.3). The feedback reaffirms the need to redefine reciprocity in terms of discipline and context.

4.4.7 WATSON-GLASER CRITICAL THINKING APPRAISAL TOOL ASSESSMENTS

The Watson-Glaser Critical Thinking Appraisal tool discussed in Section 2.9.4.1 consists of five different tests that are used to assess whether SL assisted students to develop critical-thinking skills.

4. To establish specifically whether SL cultivates critical thinking in students.

This objective is a subcategory of graduate attributes and addressed research question 3.

Results were summarised by frequencies and percentages (categorical variables), means and standard deviations (numerical variables with symmetric distributions) and medians with interquartile range (numerical variables with skew distributions). Due to the skew distribution of the samples (cf. Section 4.4.7.1) and where appropriate unmatched numerical variables were compared between the visits using the non-parametric Mann-Whitney test. A significance level of 0.05 was used during analysis. For the previously mentioned comparisons, data of individual students were used.

4.4.7.1 Visits 2 and 3, 2012 Watson-Glaser critical thinking appraisal tool results

In relation to this objective 25 appraisals were distributed during Visit 2 of 2012; 22 Radiography students returned the tool, giving a return rate of 88%. The return rate for Visit 3 was 100%. The feedback from students was assessed using the memorandum (cf. Appendix U).

The overall marks for the Watson-Glaser Critical Thinking Appraisal tool for Visit 2 of 2012 was 75,98%, and for Visit 3 it was 79,08%. The difference was analysed with the Mann-Whitney test and a p -value of 0.0949 was calculated, indicating a trend towards significant improvement in students' critical-thinking skills. The p -value was influenced by the uneven spread of the sample. The results imply that using thinking skills as listed in section 2.9.4, there was an increase in students ability to identify problems, identify assumptions, develop multiple points of view, clarify issues, generate solutions and recognise consequences of actions.

The results of the different subtests will be discussed in the following sections.

Inference test

An inference test is a conclusion that can be drawn from certain observed or supposed facts. For this test the following key was used by students:

1. True T
2. Probably True PT
3. Probably False PF
4. False F

Statement 1: SL is “a credit-bearing educational experience in which students participate in an organised service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content and achieve personal growth” (Bringle & Hatcher 1996:222).

Statement 2: SSL facilitates the achievement of Graduate attributes.

For 2012 the average of the feedback in relation to Statements 1 and 2 of the inference test for Visit 2 (n=22) was 80.21%, and for Visit 3 (n=25) it was 85.86%. There was an increase of 5.65%, but due to the skew distribution of the sample, p value calculation was compromised.

Assumption test

An assumption is something presupposed or actual. In relation to the statement, students had to indicate whether the assumption is,

1. True Yes
2. False No

Statement 1: SL is a means of achieving social justice; developing the collective good.

Statement 2: SL has an element of reciprocity; SL enhances the academe.

The average for both statements of the assumption test was 73.78% for Visit 2 and 73.89% for Visit 3, representing a minimal increase of 0.11% from the second to the third visit.

Deduction test

In the deduction test, each exercise consists of several statements (premises) followed by several suggested conclusions. In relation to the statement, students had to indicate whether the deduction is:

1. True Yes
2. False No

Statement 1: SL creates social responsiveness in students. Therefore

Statement 2: Appropriate SL benefits the community. Therefore

Statement 3: SL has an element of reciprocity; SL enhances the academe. Therefore

The results of the deduction test for Visit 2 had an average of 68.54% and Visit 3's average was 72.82%, indicating an increase of 4.28% between visits.

Interpretation test

For the interpretation test, students had to judge whether each of the proposed conclusions logically followed beyond a reasonable doubt from the information given in the section. Again, students had to indicate whether the interpretation was:

1. True Yes
2. False No

Statement 1: From the Grade 12 assessments of SL, it was clear that the presentations and slide shows were excellent, with an average percentage of 80% awarded. Grade 12 learners indicated that SL provided them with new knowledge, most said that the knowledge was useful and empowering (they would be able to tell others); some indicated that they did not understand all the information and that elocution was a problem in some instances. Radiography learners reported positive experiences: they could reinforce previous knowledge, be more involved in own knowledge creation, teamwork was excellent, the experience built confidence and they would like to get more involved in community initiatives.

The average of the interpretation test was 79.50% for Visit 2 and 96.71% for Visit 3. In this instance there was a significant increase in interpretation skill from the second to the third visit, with a p -value < 0.001.

Evaluation of arguments test

In the evaluation test students had to distinguish between arguments that are strong and arguments that are weak, as far as the question at hand was concerned.

1. The argument is strong Strong
2. The argument is weak Weak

Statement 1: Changing students' attitudes, perceptions and behaviours through specific outcomes and application of graduate attributes benefits both the community and students. This is accomplished through reciprocity that allows the construction of own knowledge by students who apply critical thinking.

The responses on the evaluation test have an average of 89% for Visit 2 and 98.3% for Visit 3. In this instance there was a 9.3% increase between Visits 2 and 3.

Figure 4.6 is a diagrammatic presentation of the 2012 Watson-Glaser Critical Thinking Appraisal tool results for Visit 2 and Visit 3.

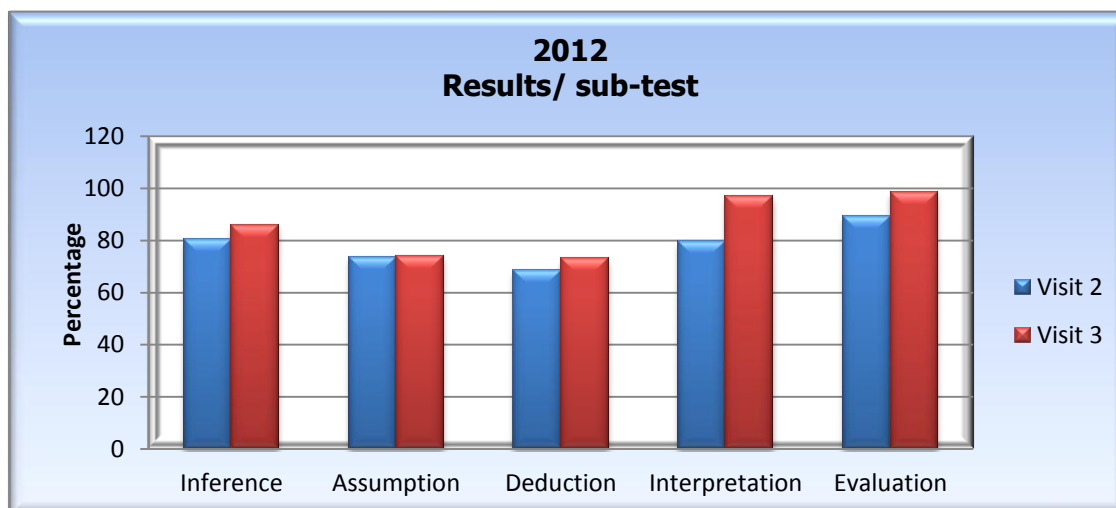


FIGURE 4.6: 2012 RESULTS PER SUBTEST OF THE WATSON-GLASER CRITICAL THINKING APPRAISAL TOOL

In 2012 all subtests increased with assumption increasing by the smallest margin; this is unfortunately not evident from Figure 4.6.

Statistically the mean/average is influenced by the outlying values, high as well as low, so a more accurate way of considering the results presented above would be to look at the median values of the different subtests, which are presented in Table 4.11.

TABLE 4.11: MEDIAN AND UPPER-QUARTILE MARKS FOR THE WATSON-GLASER CRITICAL THINKING APPRAISAL TOOL COMPLETED DURING 2012

TEST	MEDIAN		UPPER QUARTILE	
	Visit 2 2012 (n=22)	Visit 3 2012 (n=25)	Visit 2 2012 (n=22)	Visit 3 2012 (n=25)
Inference (max marks 14)	12	12	13	13
Assumption (max marks 9)	7	6	7	7
Deduction (max marks 11)	8	8	8	9
Interpretation (max marks 6)	5	6	5	6
Evaluation (max marks 6)	6	6	6	6
TOTAL (max marks 46)	36.5	38	39	40

In 2012, five students obtained 100% for the inference test of Visit 2 and six students received the same percentage for Visit 3. For the assumption test one student was scored 88.9% (highest score) during Visit 2 and six students scored 88.9% for Visit 3. The highest score for Visit 2's deduction test was nine (three students) and for Visit 3 it was 10 (two students). One student obtained 100% for interpretation during Visit 2 and 18 obtained a perfect score for Visit 3. For the evaluation test 17 students scored 100% during Visit 2 and 20 students scored 100% for Visit 3. In relation to the total score two students scored 86.96% (highest score) during Visit 2 and three students scored 86.96%; three other students achieved 89.13% and two students scored 91.3% and 93.5% respectively for Visit 3. Here the mark with the highest frequency was 84.8% (four students) for Visit 2 and 84.8%, 86.96% and 89.13% (three students each), for Visit 3.

Looking at the median values presented in Table 4.11, three subtests had the same results in 2013 as in 2012, these were inference, deduction and evaluation. The test with a higher median for Visit 2 was the assumption test, with a one-point difference. The interpretation test had a one-point higher median for Visit 3 than for Visit 2. Inference, assumption and evaluation had the same upper-quartile values; in 2012 inference and evaluation had similar results for both statistical analyses. Deduction and interpretation had higher upper-quartile scores for Visit 3. The overall results' median for 2012 was higher for Visit 3, with 1.5 marks (3.26%); the upper quartile for Visit 3 was also higher by

1 mark (2.18%). For Visit 3 students ability to reflect on ideas, actions and decisions (Sedlak, O'Doheny, Panthoffer & Anaya 2003:100) increased during 2012.

4.4.7.2 Visits 2 and 3, 2013 Watson-Glaser critical thinking appraisal tool results

In relation to this objective 43 appraisals were distributed; 42 Radiography students returned the tool, giving a return rate of 98%. The feedback from students was assessed using the memorandum (cf. Appendix U).

The sample size for Visit 2 of 2013 was 40 and for Visit 3 it was 42. Where appropriate, unmatched numerical variables were compared between the visits using the non-parametric Mann-Whitney test. A significance level of 0.05 was applied during analysis.

The overall mark for Visit 2 of 2013 was 75.13% and for Visit 3 it was 76.34%. The difference between the results of Visits 2 and 3 for the Watson- Glaser Critical Thinking Appraisal tool for 2013 had a p value of 0.8908. The difference between the samplings of 2012 had a trend towards significant p value. The p value of the overall marks difference for 2013 indicated no significant improvement in critical-thinking skills.

The following sections present the results of the subtest of the Watson-Glaser Critical Thinking Appraisal tool completed during 2013.

Inference test

Again, an inference test refers to the conclusion that can be drawn from certain observed or supposed facts.

Statement 1: (cf. Section 4.4.7)

Statement 2: SL facilitates the achievement of graduate attributes.

During 2013 the average for the feedback in relation to Statements 1 and 2 of the inference test for Visit 2 (n=40) was 67.55%, and for Visit 3 (n=42) it was 69.48%. Compared to the results of 2012, the overall percentages were much lower and the difference between the values of Visits 2 and 3 of 2013 was much smaller, at 1.93%.

Assumption test

In the assumption test, an assumption is something presupposed or actual.

Statement 1: SL is a means of achieving social justice; developing the collective good.

Statement 2: SL has an element of reciprocity; SL enhances the academe.

The average for both statements of the assumption test was 72.47% for Visit 2 and 73.69% for Visit 3. The difference between the averages showed had a minimal increase of 1.22% from Visit 2 to Visit 3. The results of 2012 and 2013 were very similar, but those of 2013 were higher.

Deduction test

In the deduction test, each exercise consists of several statements (premises) followed by several suggested conclusions.

Statement 1: SL creates social responsiveness in students. Therefore

Statement 2: Appropriate SL benefits the community. Therefore

Statement 3: SL has an element of reciprocity; SL enhances the academe. Therefore

The results of the deduction test for Visit 2 had an average of 73.64% and Visit 3's average was 71.28%. For deduction 2012's Visit 3 results showed an increase from Visit 2, whereas 2013 had a decrease from Visit Two. In both instances neither the increase between the two visits of 2012 nor the decrease of 2013 were significant.

Interpretation test

For the interpretation test, students had to judge whether each of the proposed conclusions logically followed beyond a reasonable doubt from the information given.

Regarding Statement 1 (cf. Section 4.4.7.1), the average of the interpretation test was 91.81% for Visit 2 and 88.66% for Visit 3. In this instance there was an insignificant decrease in interpretation skills. In 2012 Visit 3 results for interpretation showed the biggest increase; in contrast, the 2013 results showed a decrease.

Evaluation of arguments test

In the evaluation test students had to distinguish between arguments that were strong and arguments that were weak, as far as the question at hand is concerned.

For Statement 1 (cf. Section 4.4.4.1), the results of the evaluation test showed an average of 88.41% for Visit 2 and 92.06% for Visit 3. For this test there was a 6.63% increase between visits, with a p value of 0.9676, which was not significant. Compared to the results of 2012, the difference between Visit 2 and 3's values for 2013 was much smaller.

The results of the individual tests for 2012 and 2013 are shown in Figure 4.7. Figure 4.7 demonstrates a small increase in three of the five subtests, with two subtests showing a decrease.

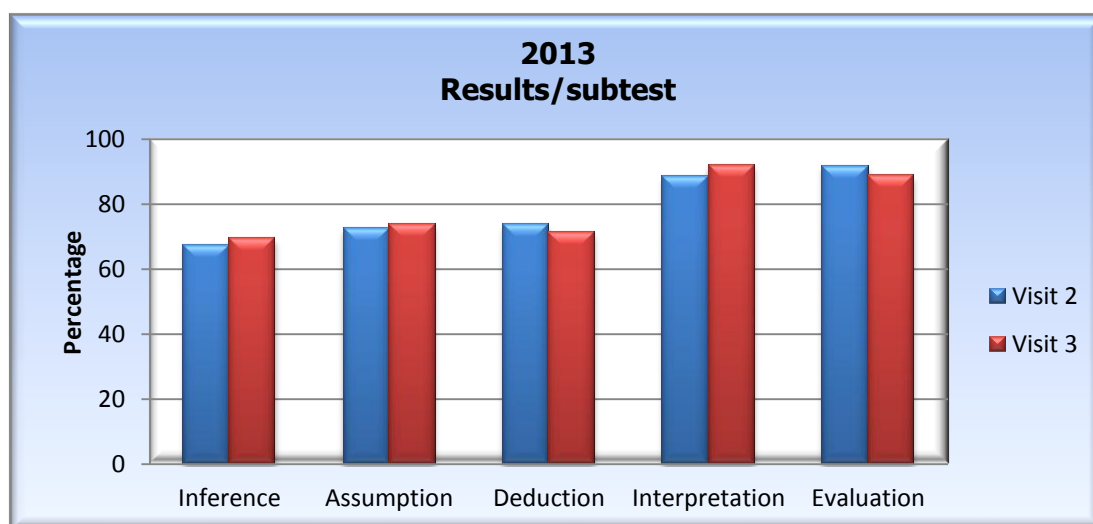


FIGURE 4.7: 2013 RESULTS PER SUBTEST OF THE WATSON-GLASER CRITICAL THINKING APPRAISAL TOOL

The median of the different subtests for 2013 is presented in Table 4.12.

TABLE 4.12: MEDIAN AND UPPER-QUARTILE MARKS FOR THE WATSON-GLASER CRITICAL THINKING APPRAISAL TOOL COMPLETED DURING 2013 (table continues on next page...)

TEST	MEDIAN		UPPER QUARTILE	
	Visit 2 2013 (n= 40)	Visit 3 2013 (n= 41)	Visit 2 2013 (n= 40)	Visit 3 2013 (n= 41)
Inference (max marks 14)	10	10	11	12
Assumption (max marks 9)	7	7	8	8
Deduction (max marks 11)	9	8	10	9
Interpretation (max marks 6)	6	6	6	6

Evaluation (max marks 6)	6	6	6	6
TOTAL (max marks 46)	36	37	39	39

The results of 2013 revealed that three students obtained 100% for the inference tests of Visit 2 and Visit 3. For the assumption test 11 students scored 88.9% (highest score) for both Visit 2 and Visit 3. The highest score for Visit 2's deduction test was 10 (12 students); for Visit 3 it also was 10 (9 students). Twenty-five students obtained 100% for interpretation during Visit 2 and 22 obtained this score for Visit 3. For the evaluation test, 28 students scored 100% during both visits. In relation to the total score, one student scored 95.7% (highest score) during Visit 2 and one student scored 93.5% for Visit 3. In this instance the mark with the highest frequency was 80.4% (five students) for Visit 2 and 84.8% (six students) for Visit 3.

The median values are shown in Table 4.12. Four subtests had the same results, these were inference, assumption, interpretation and evaluation. The test with a higher median for Visit 2 was the deduction test, one point higher than Visit 3. Assumption, interpretation and evaluation had the same upper-quartile values; for 2013 assumption, interpretation and evaluation had similar results for both statistical analyses. Inference had higher upper-quartile scores for Visit 3 and deduction was higher during Visit 2. The total mark's median for Visit 3 of 2013 was higher by 1 mark (2.18%), the upper quartile for Visits 2 and 3 was the same.

The results presented in Sections 4.4.7.1 and 4.4.7.2 suggests that SL activities may have had a positive impact on the development of critical-thinking skills in undergraduate Radiography students. In this study the individual tests developed to different extents, influenced by students' existing levels of expertise, which can be related to their field of expertise and training. Improvements were not global and appeared to be, to some extent, task dependent. For 2012 all the test scores increased from Visit 2 to 3, while in 2013 deduction and interpretation decreased slightly. For neither of the two years the increases and decreases were significant, except for the 2012 interpretation test increase, which was significant. Radiography-student training explicitly involves interpretation and evaluation of medical images. Radiographers should be able to analyse and apply evidence-based practice.

The highest starting score was for evaluation, which indicates that this was the best-developed critical-thinking skill of the third-year students. Interestingly, students achieved almost the same score for the assumptions test in Visit 3 as in Visit 2 of 2012, thus students' ability to postulate in relation to certain outcomes remained constant. A similar finding (in reference to all subtests, p values of 0.5 and 0.52 for the two groups) was achieved by Goldberg and Coufal (2009:42) with fourth- and fifth-year Communication Sciences and Disorder students. It can thus be stated that, in this study, SL had a selective effect on rather than a universal response to the development of students' critical-thinking skills.

4.4.7.3 All Visit 2 and Visit 3 Watson-Glaser critical thinking appraisal tool results

Compared to the results of the different years, the cumulative results show a universal response regarding the development of students' critical-thinking skills (cf. Table 4.13). The results also illustrate that students were able to operate in the three dimensions of critical thinking (Paul in Sedlak *et al.* 2003:100) because all the Visit 2 marks were $\geq 67.55\%$. These dimensions were elements of reasoning (identifying problems, identifying assumptions), abilities of reasoning (raising questions, clarifying issues, generating solutions and evaluating actions), and traits of reasoning (including fair-mindedness).

TABLE 4.13: TOTAL SAMPLE MARKS FOR THE WATSON-GLASER CRITICAL THINKING APPRAISAL TOOL COMPLETED DURING 2012 AND 2013

	INFERENCE		ASSUMPTION		DEDUCTION		INTERPRETATION		EVALUATION	
	VISIT 2	VISIT 3	VISIT 2	VISIT 3	VISIT 2	VISIT 3	VISIT 2	VISIT 3	VISIT 2	VISIT 3
2012	80.21%	85.86%	73.78%	73.89%	68.54%	72.82%	79.50%	96.71%	89.00%	98.30%
2013	67.55%	69.48%	72.47%	73.70%	73.65%	71.29%	88.66%	91.81%	88.41%	92.06%
Average	73.88%	77.67%	73.13%	73.80%	71.10%	72.06%	84.08%	94.26%	88.71%	95.18%

Though the results presented in Table 4.13 do not illustrate a statistically significant increase, the scores on all subtests did increase. Inference increased the most, by 6.51%, followed by assumption (4.86%) and evaluation, by 2.71%. Deduction had the second-lowest increase, namely, 2.63% and interpretation had the least improvement, namely, 1.29%. Students illustrated the three key components of critical thinking as described by Beyer (1987:17), namely cognitive operations, knowledge and attitude. Cognitive

operation relates to finding meaning, such as distinguishing between what is relevant and what is irrelevant. Knowledge refers to how to execute various thinking operations, which result from students' experiences, using reliable sources of data, domain-specific heuristics, analytical and organisational concepts.

4.4.7.4 42ND ISETL conference 2012 results

Five delegates attending the 42nd Learning (ISETL) conference 2012 completed the questionnaire.

All five delegates' (100%) experiences with SL confirm that *communities benefit from SL*. Once again, all delegates indicated that the statement, *SL cultivates social responsiveness in students and changes behaviour*, is true. Eighty percent of delegates reported that *SL cultivates critical thinking in students* and 20% indicated that it is probably true. In relation to *SL allowing students to achieve the graduate attributes* (discussed in more detail in the next section), the spread was 80% true and 20% probably true. Eighty percent of delegates felt that *SL allows students to achieve specific outcomes* and 20% indicated that it is probably true. In relation to *Reciprocity (enhancement of the curriculum) is achievable when doing SL*, 80% said that this statement is true and 20% said it is probably true.

As a teaching and learning method, SL can take on different forms influenced by the discipline, context and setting. Though this is the case, feedback from conference delegates correlates with feedback given by SA SL facilitators (see Section 5.9)

TABLE 4.14: 42ND ISETL DELEGATES' FEEDBACK ON THE GENERIC ATTRIBUTE SKILLS

GRADUATE ATTRIBUTES	T	PT	PF	F
SL assists students to identify and solve problems	60%	40%		
SL assists students to display creative and critical thinking	60%	40%		
SL assists students to work effectively with others in the community and educational environment	100%			
SL assists students to manage themselves with respect to community intervention, educational environment and in a personal context	80%	20%		
SL assists students to communicate effectively in the community and educational environment.	100%			
SL assists students to use science and technology effectively in the community and educational environment	80%	20%		
SL assists students to acquire a high level of information literacy	60%	40%		
SL assists students to understand themselves and their role within society	100%			

The results presented in Table 4.14 confirm that SL assists students to attain graduate attributes. All of the delegates at the 42nd ISETL conference who completed the questionnaire said that it is true or probably true that SL assists students to achieve the individual graduate attributes. Most of the participants ($\geq 60\%$) were of the opinion that it is true that SL assists students to reach the graduate attributes.

4.5 CONCLUSION

The quantitative results of the Grade 12 learners' and contact persons' rubrics presented in this chapter reveal that the community benefits from Radiography SL and that SL enables students to achieve the graduate attributes through participating in group presentations. Both the aforementioned conclusions were confirmed by delegates attending the 42nd ISETL conference. In most instances students were organised, used science and technology effectively, teamwork was good and communication and presentation skills were excellent. Students were not only able to achieve the generic skill outcomes but also the specific learning outcomes as evaluated by the Radiography facilitator outcomes assessment rubric. The rubric also enabled the researcher to measure the extent to which the outcomes were reached. Similar results were presented by the feedback of the conference delegates.

The results of the Watson-Glaser Critical Thinking Appraisal tool indicated an increase in the students' critical-thinking skills in all the subtests during 2012, with a trend toward significant illustrated by the p value calculated. The results of 2013 indicated an increase in the students' critical-thinking skills in three of the five subtests, with two tests experiencing a decrease. The p values of the data of Visits 2 and 3 of 2013 showed no significant increase in the students' critical-thinking skills. The feedback from delegates attending the 42nd ISETL conference, however, showed that facilitators do believe that SL activities increase students' critical-thinking skills. Further, delegates believed that SL cultivates social responsiveness in students and that reciprocity is achievable when doing SL.

In Chapter 5, *Postulate to Praxis II*, the qualitative data of the Grade 12 learner and contact person rubrics, the Radiography students' reflection rubrics and discussion, and the interviews with facilitators from other institutions will be presented.

CHAPTER 5

POSTULATE TO PRAXIS II

QUALITATIVE RESULTS, DATA ANALYSIS, INTERPRETATION AND DISCUSSION

5.1 INTRODUCTION

In the previous chapter the results, data analysis, interpretation and discussion of the quantitative data were presented. In this chapter Chapter 5 the qualitative data is presented, analysed and discussed. This includes qualitative information from the rubrics of the participating Grade 12 learners and contact persons. In addition, the qualitative data from the Radiography students' reflection rubrics and discussion and the interviews with facilitators from all the institutions will be presented and discussed.

5.2 SCHEMATIC OVERVIEW OF THE CHAPTER

The schematic overview of the chapter presented in Figure 5.1 serves to summarise the chapter. All Grade 12 Visit 2 data of both 2012 and 2013 will be presented and discussed, after which the Grade 12 Visit 3 data for both years will be discussed. Analysis, interpretation and comparisons of Visit 2 and Visit 3 data will complete the evaluation of the data of the Grade 12 rubrics. The data from the contact person, and student reflections and discussions will be handled similarly and reported on. After presentation, analysis, interpretation, comparison and discussion of the results of the interviews with Radiography facilitators from other institutions, the chapter will be concluded.

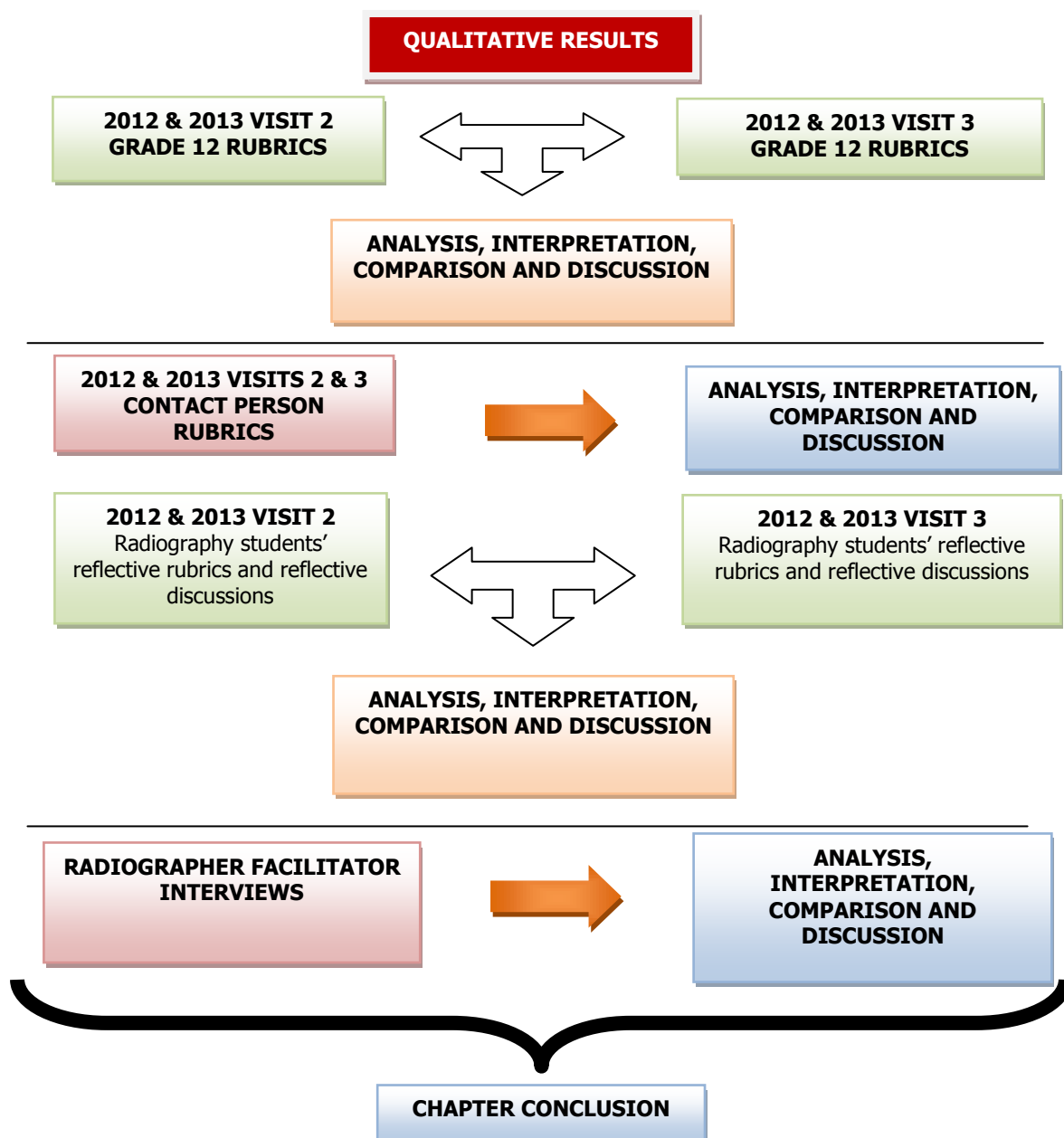


FIGURE 5.1: SCHEMATIC OVERVIEW OF CHAPTER 5
(Compiled by the researcher, Botha 2014)

5.3 SUMMARY OF QUALITATIVE DATA GATHERING

As discussed in Section 3.3.3, Grade 12 learners and the contact persons at each site evaluated the presentations during the second visit in the second term and the third visit during the third term. The quantitative parts of the rubrics asked the Grade 12 learners and contact persons if they benefited from the intervention (cf. Sections 4.4.3.2 & 4.4.3.3). The follow-up question requested them to explain their answers.

After the second and third visits Radiography students completed the reflection rubric adapted from Zlotkowski (in HEQF 2006:74) and Laplante (2007:231) (cf. Appendix R and Appendix S). Students also participated in a reflection discussion after the interventions. A semistructured interview (Appendix N) was used to articulate the experiences of SL by facilitators at other institutions presenting Radiography in relation to the objectives of the study.

5.4 VISIT 2: GRADE 12 ASSESSMENTS

The qualitative part of the Grade 12 rubrics required the Grade 12 learners to explain why they believed that they had benefited or had not benefited from the intervention. In addition, Grade 12 learners had to provide advice for improving future visits.

The rubric assessed the following research questions Section 1.4.3 and associated objectives:

1. To establish whether the community benefits from Radiography SL; and
3. To investigate the effectiveness of SL in enabling students to achieve the graduate attributes.

In relation to these objectives 183 Grade 12 learners completed rubrics during the second visit of 2012, and in 2013, 205 Grade 12 learners completed rubrics during the second visit, giving a total of 388.

5.4.1 Theme 1: YES answer

From Figures 4.2 and 4.4 it is clear that 96% (2012) and 91% (2013) of the Grade 12's believed that they benefitted from the SL intervention. Grade 12 learners were asked to *Explain their answers* in reference to the quantitative question. *Have you benefited from this experience?* In reference to this theme, singular categorical answers with rubric references will be presented first (Categories 1.1-1.6). Thereafter categories with bigger sample sizes, without subcategories (Categories 1.7-1.17), will be given. In reference to this group no rubric references will be given, due to sample size. The categories with subcategories, however, have smaller samples, which makes rubric references possible.

5.4.1.1 *Singular categories*

The singular categories for this theme are presented in Table 5.1.

TABLE 5.1: SINGULAR CATEGORIES OF THE THEME *EXPLAIN THEIR ANSWER* (ANSWERED YES)

CATEGORY NO.	CATEGORIES (N=1)	RUBRIC NO.
Category 1.1	<i>It was cool</i>	2226
Category 1.2	<i>Impressive</i>	2015
Category 1.3	<i>Enjoyed it</i>	2372
Category 1.4	<i>Best info I ever heard, like watching TV</i>	2381
Category 1.5	<i>Great experience</i>	2375
Category 1.6	<i>Presentation skills good</i>	2017

The six Grade 12 learners who gave these unique responses show individual experiences that could indicate a deeper appreciation of the intervention.

5.4.1.2 *Category clusters (without subcategories)*

Category 1.7-1.18

Some Grade 12 learners indicated that they benefited from the presentation due to the *Good explanation of concepts* by Radiography students. Some of the Grade 12 learners stated that, because the students were *Organised*, the learners benefited from the experience. Other Grade 12 learners reported that the session was *Insightful* and that *Students were confident*.

In addition to the students being experienced as organised and confident, some Grade 12 learners stated that students were *Well prepared* and learners therefore benefited from the experience. Some Grade 12 learners said that they benefited from the presentations because they were *Interesting*. Some Grade 12 learners indicated that they had benefited from the experience by giving statements like, *I gain knowledge*. The feedback from Grade 12 learners confirms Alperstein's assertion that community members will benefit and gain new knowledge (Alperstein 2007:59).

Comments, such as *Info new to me*, made by Grade 12 learners in reference to why they believe that they benefited from the experience, were made by science as well as non-science learners. This indicates that the students were able to translate the material

associated with the learning outcomes in a way that enabled learners with different levels of scientific knowledge to benefit from the intervention.

Grade 12 learners also said that they *Understood everything* or that they have *Better understanding* of concepts because they were *Explained well*. These comments can be attributed to science learners (bear in mind that the Grade 12 natural-science curriculum includes learning units on production and interactions of x-rays). Grade 12 science learners' understanding of relevant topics improved.

5.4.1.3 Category clusters (with subcategories)

Category 1.19

Grade 12 learners were of the opinion that they benefited from the intervention because it was *Relevant*. Some of the learners explained further, thus allowing the creation of the following subcategories associated with Category 1.19.

TABLE 5.2: SUBCATEGORIES OF THE *RELEVANT* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.19.1	<i>Natural science syllabus</i>	1009 and 2049
Subcategory 1.19.2	<i>Mamma self-evaluation</i>	2061 and 2062

The subcategories in Table 5.2 illustrate that learners believed that the presentation was *Relevant* to their lives, in an academic sense, but also to their own and their communities' health and well-being. This feedback also illustrates the application of knowledge and thus the relevance of the curriculum (Duckenfield & Swanson 1992:6).

Category 1.20

A large number of Grade 12 learners reported that they benefited from the presentation because it was *Informative*, which, in itself, can be viewed as a superficial judgement of the exercise. However, taking closer look at the following subcategories, which feed this statement, *Informative* becomes more substantial.

TABLE 5.3: SUBCATEGORIES OF THE *INFORMATIVE* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.20.1	<i>Breast cancer</i>	1026 and 1037
Subcategory 1.20.2	<i>Men also get breast cancer</i>	1106, 1114, 1125, 1128, 1137, 1144, 1154, 1169, 1170, 2012, 2032-2034, 2040, 2099, 2105, 2106, 2110-2113, 2118, 2125, 2128, 2190, 2142 and 2146
Subcategory 1.20.3	<i>New to them, Unfamiliar with the information</i>	2050, 2052, 2056 and 2114
Subcategory 1.20.4	<i>Loved the presentation</i>	2082 and 2083

Students were able to inform Grade 12 learners of aspects associated with mamma carcinoma that learners had not been aware of; students were also able to provide new and unfamiliar concepts to Grade 12 learners, who were at a lower level of information literacy than the students.

Category 1.21

There were instances of Grade 12 learners expressing the opinion that they benefited from the presentation because Radiography students *Educated them*. *Educated them* implies a deeper level of learning by the Grade 12 learners—the presentation was more than merely informative. The following subcategories were presented.

TABLE 5.4: SUBCATEGORIES OF THE *EDUCATED THEM* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.21.1	<i>Men also get breast cancer</i>	1041, 1048, 1053, 2034
Subcategory 1.21.2	<i>Mamma self evaluation</i>	2034

Here the subcategories (Table 5.4) lean towards health and well-being, and towards a broad societal impact, specifically for Subcategory 1.21.1.

Category 1.22

Some of the Grade 12 learners believed that they benefited from the presentation; they reported that it conveyed *Valuable information*. This description of the information takes the experience to another level for some learners. The following subcategories were presented.

TABLE 5.5: SUBCATEGORIES OF THE *VALUABLE INFORMATION* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.22.1	<i>Tell others</i>	2148, 2163, 2196
Subcategory 1.22.2	<i>Self-assessment</i>	2151, 2169
Subcategory 1.22.3	<i>Men also get breast cancer</i>	2150, 2151, 2155, 2156, 2169

The feedback for the subcategories listed in Table 5.5, inform us that health and well-being are regarded as priorities by some learners. This prioritisation does not end at the self, but others (broader society) should also be informed. The feedback from Grade 12 learners aligns with Behera and Erasmus' statement that SL facilitates sustainable development of communities by integrating knowledge, skill and resources, thereby leading to social and economic transformation (Behera & Erasmus cited in Fourie 2003:33).

Category 1.23

A few of the Grade 12 learners believed that they benefited from the presentation because they *Learned a lot*. The following subcategories were presented.

TABLE 5.6: SUBCATEGORIES OF THE *LEARNED A LOT* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.23.1	<i>Non-science, will tell others</i>	2117, 2127
Subcategory 1.23.2	<i>New info</i>	2057, 2060, 2064, 2073-2075, 2085, 2126

As indicated earlier, both science and non-science learners reported that they benefited from the presentations. This can be seen in the subcategories associated with *Learned a lot* presented in Table 5.6.

Category 1.24

There were instances of Grade 12 learners reporting that they benefited from the presentation because they gained *Comprehensive knowledge*. In addition to comments of *Comprehensive knowledge*, which on its own is a bonus, three learners were more specific, as can be seen in the subcategories presented in Table 5.7.

TABLE 5.7: SUBCATEGORIES OF THE *COMPREHENSIVE KNOWLEDGE* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.24.1	<i>Enriched my mind</i>	2160
Subcategory 1.24.2	<i>Causes/prevention</i>	2162
Subcategory 1.24.3	<i>Men also get breast cancer</i>	2162

The comments of Grade 12 learners presented in Sections 5.4.1.1 and 5.4.1.2 (Visit 2 results) is an indication of the extent to which the students were able to demonstrate mastery of some graduate attributes. Srinivas and Wrench (2012:8) indicate that students initially found SL challenging and thus had to come up with solutions by being creative and original.

In addition, Radiography students,

- worked effectively with others in the community;
- worked effectively with others in the educational environment;
- managed themselves with respect to the educational environment and in a personal context;
- communicated effectively;
- used science and technology effectively; and
- acquired a high level of information literacy.

As Swindon indicates, SL provides collaborative learning opportunities for students to achieve graduate attributes in the classroom and during actual presentations in a community setting (Swindon 2005:18). The comments of Grade 12 learners suggest sustainable-development concepts, like the achievement of lasting satisfaction of human needs and improvement of the quality of human life (Behera & Erasmus cited in Fourie 2003:33).

5.4.2 Theme 2: NO answer

During Visit 2, 4% of the Grade 12's in 2012 and 9% in 2013 indicated that they did not benefit from the interaction (*cf.* Section 4.4.2.3 & 4.4.3.3). Grade 12 learners were asked to *Explain their answer* in reference to the quantitative question, *Have you benefited from this experience?* The clarification of the *No* answers will be presented as follows: Categories 2.1-2.5, categories without subcategories with rubric references; and Category 2.6 with subcategories and rubric references.

5.4.2.1 Category clusters (without subcategories)

Categories 2.1-2.5

There were instances of Grade 12 learners reporting that the information was *Not useful*—these responses are in rubrics 2326 and 2327. There were also instances where Grade 12 learners believed that the *Information was old* (rubrics 1010, 2310, 2311, 2315, 2350, 2353 and 2361). At least two Grade 12 learners reported that the *Information was not useful*—as in rubrics 2318 and 2319. Other Grade 12 learners indicated that they did

not benefit because they were not *Aware of all the information* (1010), whereas others said that they did not benefit, though *it was informative* (1100).

5.4.2.2 Category clusters (with subcategories)

Category 2.6

Some Grade 12 learners who were of the opinion that they did not benefit from the intervention stated that they *Did not understand*. Some of the learners explained further, thus allowing the creation of the subcategories associated with Category 2.6 presented in Table 5.8.

TABLE 5.8: SUBCATEGORIES OF THE *DID NOT UNDERSTAND* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 2.5.1	<i>Not natural science did not understand</i>	1168, 2325
Subcategory 2.5.2	<i>Understood some</i>	1168

Only a few learners said that they did not benefit from the presentation and interaction with the Radiography students during the second visit. The comments presented in Sections 5.4.2.1 and 5.4.2.2 relate to some learners who already had some knowledge about the subject that was presented and were therefore disinterested; and others failing to understand because some learners were not science learners. These solitary responses are in contrast to the feedback from learners presented earlier, stating that they understood better, and understood everything, and non-science learners saying that they benefited and will tell others.

5.4.3 Theme 3

Because Vernon and Ward report that communities believe that there are benefits and challenges in working with students (Vernon & Ward 1999:32), Grade 12 learners were asked to *How can we improve future visits?* In reference to this theme singular categorical answers with rubric references will be presented first (Categories 3.1-3.7). This will be followed by categories with bigger sample sizes, but without subcategories (Categories 3.8-3.19). In reference to this group no rubric references will be given due to sample sizes. The categories with subcategories, however, have smaller samples, which makes rubric references possible.

5.4.3.1 *Singular categories*

Because only one learner is represented in each of the categories presented in Table 5.9, the feedback can be considered malicious, but all feedback is valid. Some of these concerns, such as *Less technical words–Commerce student*, were addressed during Visit 3, but some responses could not be addressed, such as *Bring experienced radiographers*. Some responses need further consideration, *Other students* and *CUT visit*.

TABLE 5.9: SINGULAR CATEGORIES OF THE THEME *HOW CAN WE IMPROVE FUTURE VISITS*

CATEGORY NO.	CATEGORIES (N=1)	RUBRIC NO.
Category 3.1	<i>Bring experienced radiographers</i>	1013
Category 3.2	<i>Teamwork</i>	1129
Category 3.3	<i>Other students</i>	1294
Category 3.4	<i>Less technical words–Commerce student</i>	2113
Category 3.5	<i>CUT visit</i>	2252
Category 3.7	<i>Tongue ring not pleasing</i>	2268

5.4.3.2 *Category clusters (without subcategories)*

Categories 3.8-3.19

There were learners who believed that a *Bigger venue* is needed to enable students to express themselves better. It is important to keep in mind that students were made aware of the limitations of the physical facilities during Visit 1 and that the group had no control over the venues available at the schools. *More visits* were requested by some learners. This indicates their appreciation and eagerness to learn new things and it also aligns with the idea of sustainability through regular interaction. There were Grade 12 learners who were of the opinion that students needed to improve their *Organisation*. This type of feedback could have been because the second visit involved the first presentation and interaction with the Grade 12 learners and, though prepared, students were anxious and seemed disorganised. Nevertheless, this is useful feedback for the third visit. Some learners want the message to be spread over a wider area by including *More schools* and thereby also increasing the number of beneficiaries. Giving *Free stuff* was another improvement suggested by some Grade 12 learners. Individual community members indicated that they would have benefited more from the experience if they had received something tangible. A suggestion of *More time* for interactions suggests that some learners believed that it would have been more beneficial and that the impact would

have been greater with longer rather than short sessions. *More relevant topics* related to both non-science learners and male learners, indicating that some of the topics covered during the presentation were not applicable to everyone. There were also instances of learners suggesting that encounters with the community would be improved by *Practice*, *Simplify* and *Demonstrations*. It was also surprising and reassuring that some Grade 12 learners indicated that *Nothing* needs improvement.

5.4.3.3 Category clusters (with subcategories)

Category 3.20

Slides did not only relate to layout and font size, but also related to the subcategories presented in Table 5.10.

TABLE 5.10: SUBCATEGORIES OF THE *SLIDES* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.20.1	<i>More pictures</i>	1037,1080
Subcategory 3.20.2	<i>Spelling and grammar</i>	1117
Subcategory 3.20.3	<i>Videos</i>	2226

Though one learner indicated that students need to improve *Spelling and grammar* it would seem that learners want to be entertained during learning through the use of graphics and videos.

Category 3.21

A large number of the Grade 12 learners indicated that students should improve their *Presentation skills*. In addition to this specific comment, eight subcategories could be extrapolated, as seen in Table 5.11

**TABLE 5.11: SUBCATEGORIES OF THE *PRESENTATION* CATEGORY
(table continues on next page...)**

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.21.1	<i>Eye contact</i>	1028, 1068, 1112, 1115, 1118, 1119, 1123, 2036, 2065, 2074, 2078, 2098, 2100, 2103, 2110, 2118, 2135
Subcategory 3.21.2	<i>Body language</i>	1116, 1172
Subcategory 3.21.3	<i>Enthusiasm</i>	1139,1163, 1168, 2010, 2149, 2179, 2188
Subcategory 3.21.4	<i>Voice projection</i>	2001

Subcategory 3.21.5	<i>Clear voice</i>	2014, 2040-2042, 2106, 2173, 2175,
Subcategory 3.21.6	<i>Too fast</i>	2067, 2103, 2125, 2127, 2137, 2163
Subcategory 3.21.7	<i>Pronunciation</i>	2003, 2067
Subcategory 3.21.8	<i>Volume</i>	2003, 2004, 2007, 2009-2010, 2014, 2015, 2017, 2018, 2021-2022, 2026, 2029, 2031, 2033-2036, 2044-2047, 2080, 2083, 2125, 2127, 2171

In the light of preparation for the third visit, this was very valuable feedback. Presentation skills have a direct influence the delivery of the message and although students are exposed to presentations in normal class situations, anxiety and fear of the unfamiliar could have influenced their presentations in this new context negatively.

Category 3.22

Not only do Grade 12 learners love visuals, but some indicated that students should use more *Props* during the presentation. Subcategories in addition to the request for *Propare* presented in Table 5.12; some of these suggestions involve an interactive element.

TABLE 5.12: SUBCATEGORIES OF THE *PROPS* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.22.1	<i>More equipment</i>	1078
Subcategory 3.22.2	<i>Games</i>	2116, 2174

Category 3.23

More info can be an indication that some learners want to learn more, and that they enjoyed the experience. The information in Table 5.13 suggests that some learners want to obtain more in-depth information.

TABLE 5.13: SUBCATEGORIES OF THE *MORE INFO* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.23.1	<i>More detail</i>	1004, 1108, 1125
Subcategory 3.23.2	<i>More examples</i>	1116,1172

Category 3.24

A large number of Grade 12 learners stated that students needed to improve their *Confidence*. Again, this is valuable feedback, not only in relation to the third visit, but it also helps students to identify areas that need attention and facilitates self-awareness and personal growth. Personal growth refers to the development of characteristics related to

self-improvement and self-actualisation, including self-confidence and self-esteem (Duckenfield & Swanson 1992:6). Table 5.14 lists specific comments related to *Confidence*.

TABLE 5.14: SUBCATEGORIES OF THE *CONFIDENCE* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.24.1	<i>Self esteem</i>	2183, 2189
Subcategory 3.24.2	<i>Relax</i>	2210

Category 3.25

Some learners reported that the intervention would be improved if students had attended to *Preparation*. Again, the perceived lack of preparation could have been due to a decrease in confidence due to the unfamiliar situation. For this category the further subcategories in Table 5.15 were identified.

TABLE 5.15: SUBCATEGORIES OF THE *PREPARATION* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.25.1	<i>Some unfamiliar with work</i>	2329
Subcategory 3.25.2	<i>Concepts clarified</i>	2380
Subcategory 3.25.3	<i>No reading</i>	2248

According to Grade 12 learners, students seemed to be unfamiliar with the work, did not clarify concepts and read from the slides during the presentation.

Category 3.26

Explanation of complex concepts was one of the improvements suggested, which could have been influenced by perceived lack of preparation (Subcategory 3.25.2), but it could also be related to learners claiming that they preferred presentations and learned more if graphics, props and practical examples are used; this can be seen in Table 5.16.

TABLE 5.16: SUBCATEGORIES OF THE *EXPLANATION OF COMPLEX CONCEPTS* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.26.1	<i>More pictures</i>	1037
Subcategory 3.26.2	<i>Practical examples</i>	1057, 1120, 1128, 1155
Subcategory 3.26.3	<i>Props</i>	1146, 1157, 1176

Category 3.27

Communication skills and presentation skills were intertwined with differences made possible by the subcategories presented in Table 5.17. The subcategories presented generally apply to communication skills, because it relates to language skills, pronunciation as well as fluency, in what is mostly a second language for students.

TABLE 5.17: SUBCATEGORIES OF THE *COMMUNICATION SKILLS* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.27.1	<i>Language skills</i>	1006
Subcategory 3.27.2	<i>More fluent</i>	1021,1123
Subcategory 3.27.3	<i>Pronunciation</i>	1015, 1020,1022, 1069, 1130, 1131
Subcategory 3.27.4	<i>Louder</i>	1029, 1053, 1068, 1070, 1088, 1089, 1092, 1096, 1099, 1102, 1113, 1126, 1134, 1141, 1144, 1148, 1149,1161, 1170, 1172

Category 3.28

Handouts were suggested by learners as another way to improve future interventions. From the subcategories in Table 5.18 it is clear that marketing should form part of the visits, as should pamphlets about the topics presented. Some learners thus want something tangible and, in this instance, they want something to improve their lives, in contrast to learners (cf. Section 5.4.3.2.1) who wanted *Freebies* (t-shirt, chocolate).

TABLE 5.18: SUBCATEGORIES OF THE *HANDOUTS* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.28.1	<i>CUT brochures</i>	1164, 1165
Subcategory 3.28.2	<i>Pamphlet</i>	1085, 1136, 1137

Category 3.29

Grade 12 learners indicated that the experience would have been of greater value if there had been *More interaction* between students and Grade 12 learners. Grade 12 learners also made suggestions to improve interaction, as listed in Table 5.19.

TABLE 5.19: SUBCATEGORIES OF THE *MORE INTERACTION* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.29.1	<i>Q&A</i>	2004, 2378, 2244, 2294
Subcategory 3.29.2	<i>Survivors</i>	2057
Subcategory 3.29.3	<i>Games + competitions</i>	2166, 2174

Though Grade 12 learners acknowledged students' mastery of graduate attributes, there were some areas in *Presentation* and *Communication skills* and slide creation that learners believed needed attention. In some instances, references were made to specific students and not the group as a whole. Non-science learners reported that *Simplification* and more *Explanation* is needed to improve their understanding of the topics. Grade 12 learners also indicated that the use of *Props*, *Graphics* and *More interaction* would increase their receptiveness to new information. Encouraging comments, such as *More visits*, *More schools*, *More info*, and *More time*, not only indicate Grade 12 learners' appreciation, but also inform us that learners perceive these types of interaction as beneficial.

5.5 VISIT 3: GRADE 12 ASSESSMENTS

As discussed in Section 5.4, the qualitative part of the Grade 12 rubrics required the Grade 12 learners to explain why they believe that they either benefited or did not benefit from the intervention. In addition, Grade 12 learners had to provide advice on how to improve future visits. In this section the Visit 3 feedback is presented and discussed.

The rubric thus assesses the following research questions (Section 1.4.3) and associated objectives:

1. To establish whether the community benefits from Radiography SL; and
3. To investigate the effectiveness of SL in enabling students to achieve the graduate attributes.

In relation to these objectives 117 Grade 12 learners completed rubrics during the third visits of 2012 and 178 Grade 12 learners completed rubrics during the third visit of 2013, giving a total of 295, 93 less than the Visit 2 sample.

5.5.1 Theme 1: YES answer

Grade 12 learners were asked to *Explain their answer* in reference to the quantitative question, *Have you benefited from this experience?* Most of the Grade 12's (97% for 2012 and 91% for 2013) believed that they benefitted from the experience. In reference to this theme singular categorical answers with rubric references are presented first (Categories 1.1-1.6). Thereafter categories with bigger sample sizes, without subcategories (Categories 1.7-1.17), will be given. In reference to this group no rubric

references will be given due to sample size. The categories with subcategories, however, have smaller samples, which makes rubric references possible.

5.5.1.1 *Singular categories*

The singular categories presented in Table 5.20 present individual comments of appreciation, in the same way as Visit 2 feedback is presented in Section 5.4.1.1. One Grade 12 learner said that he/she *enjoyed the presentation*, another said that it was a *great experience*, but this time there were also comments such as *Loved the presentation* and *Meaningful presentation*. They also indicate that the level of expertise, execution of the presentations and engagement by the students were of a high standard.

TABLE 5.20: SINGULAR CATEGORIES OF THE THEME *EXPLAIN THEIR ANSWER* (ANSWERED YES)

CATEGORY NO.	CATEGORIES (N=1)	RUBRIC NO.
Category 1.1	<i>Insightful</i>	2209
Category 1.2	<i>Loved the presentation</i>	2306
Category 1.3	<i>Enjoyed it</i>	2372
Category 1.4	<i>Great experience</i>	2375
Category 1.5	<i>Meaningful presentation, I never liked anything to do with health</i>	2242
Category 1.6	<i>Longer presentations</i>	2221

5.5.1.2 *Category clusters (without subcategories)*

Categories 1.7-17

Some Grade 12 learners stated that they benefited from the presentation because it was *Interesting*. After the third visit, some learners again indicated that the visit was beneficial because *I gain knowledge*. Compared to the host of learners who said the presentation was *Interesting*, gaining knowledge describes a more intense interaction that will stay with the learners and thus lead to lifelong benefits.

The comment, *Info new to me* can be attributed to non-science learners, because the Doppler effect is covered by the Grade 12 science curriculum. Thus non-science learners reported that they benefited notwithstanding the fact that they had less exposure to most concepts. This also means that the students did a good job of delivering the information.

Some learners believed that they benefited because students *Explained well*, and therefore learners either had a *Better understanding* or *Understood everything*. These comments suggest that the learners have previous exposure to some of the elements discussed and, as science learners, they benefited from the presentation as it improved their understanding. For Visit 3 this finding relates specifically to the Doppler effect.

Further, some Grade 12 learners stated that because *I learned a lot* from the *Valuable info* presented during Visit 3's *Good presentation* and intervention, they benefited because it was *To my advantage*.

5.5.1.3 Category clusters (with subcategories)

Category 1.18

As during Visit 2, Grade 12 learners were of the opinion that they benefited from the intervention because it was *Relevant*. Some of the learners explained further, thus allowing the creation of the following subcategories associated with Category 1.18.

Table 5.21 provides these subcategories and also reveals that relevance pertains to all spheres of the learners' lives—academic, health and well-being—but also has an element of social responsibility and relevance to others.

TABLE 5.21: SUBCATEGORIES OF THE *RELEVANT* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.18.1	<i>Natural science syllabus</i>	2372, 2335, 2249, 2250-2251, 2253, 2262, 2264, 2283, 2290, 2337, 2339, 2344, 2346, 2382
Subcategory 1.18.2	<i>Food/nutrition</i>	2369, 2370
Subcategory 1.18.3	<i>Help others</i>	2247, 2297, 2373
Subcategory 1.18.4	<i>Tell others</i>	2297

Grade 12 learners' feedback indicates elements of sustainable development, such as improving the quality of human life (Behera & Erasmus cited in Fourie, 2003:33).

Category 1.19

Some of the Grade 12 learners reported that they benefited from the presentation because it was *Informative*. In addition to this category, except for the single-word feedback of *Informative*, subcategories are presented in Table 5.22.

TABLE 5.22: SUBCATEGORIES OF THE *INFORMATIVE* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 1.19.1	<i>4D</i>	2206
Subcategory 1.19.2	<i>To study</i>	2275, 2278, 2282, 2284, 2289

In reference to the subcategories presented above, it is clear that the appeal of Visit 3 relates mainly to the benefits of the information in relation to a possible career choice.

The feedback with regard to the third visit as presented in Sections 5.5.1.1 - 5.5.1.3 places slightly less emphasis on demonstration of mastery of the graduate attributes, and more on the benefits for Grade 12 learners, because the topics presented have bearing on what they are learning at school. The focus change also suggests that the relevance and perceived usefulness of the interventions increased between visits.

The variety of feedback about why Grade 12 learners believed that they benefited decreased from the second to the third visit. Considering the major, most populated categories, there was an increase in *Relevance* from Visit 2 to Visit 3 of 2012. This was also the case for *Interesting* and *Understood*, but *Informative* and *Educational* decreased. For 2013, learners indicated that Visit 3's topics were less *Relevant* to them, but more *Informative*. There was a big increase in learners who declared that the information was *Valuable* during Visit 3 and a slight increase in the number of learners who said that they had *Learned a lot*.

5.5.2 Theme 2: NO answer

Only 3% in 2012 and 9% in 2013 of Grade 12's indicated that they did not benefit from the presentations during Visit 3. Grade 12 learners were asked to *Explain their answer* in reference to the quantitative question, *Have you benefited from this experience?* In reference to this theme singular categorical answers with rubric references are presented first (Categories 2.1-2.2). Thereafter categories with bigger sample sizes, without subcategories (Categories 2.3-2.7) are given. The categories with subcategories, however, have smaller samples, which makes rubric references possible.

5.5.2.1 *Singular categories*

There were learners who believed that they did not benefit from the engagement. The comments listed in Table 5.23 indicate that one learner's opinion was based on the fact that he/she already knew some of the information presented and, in the case of one non-science student, that it was not applicable to him/her.

TABLE 5.23: SINGULAR CATEGORIES OF THE THEME *EXPLAIN THEIR ANSWER* (ANSWERED NO)

CATEGORY NO.	CATEGORIES (N=1)	RUBRIC NO.
Category 2.1	<i>I already knew some</i>	2168
Category 2.2	<i>Not applicable to me</i>	2217

5.5.2.2 *Category clusters (without subcategories)*

Categories 2.3-2.7

There were instances of Grade 12 learners believing that the *Information was old*, and *I already know*—these responses were in rubrics 2353 and 2361. Accounting learners indicated that the *Information was not useful, accounting not science*—these responses were in rubrics 2318 and 2319. Some non-science learners *did not understand the information* and therefore they did not benefit. Again, non-science learners believed that *It was not applicable* to them.

Compared to the second visit, fewer Grade 12 learners indicated that they did not benefit from the interaction. These responses were mostly by non-science learners and in one rubric a science learner indicated that he/she was already aware of the information.

5.5.3 Theme 3

During Visit 3, in reference to the quantitative question, *Have you benefited from this experience?* Grade 12 learners were asked, *How can we improve future visits?* In reference to this theme singular categorical answers with rubric references are presented first (Categories 3.1-3.7). Thereafter categories with bigger sample sizes, without subcategories (Categories 3.3-3.13), are given. In reference to this group no rubric references will be given, due to samples size. The categories with subcategories, however, have smaller samples, which makes rubric references possible.

5.5.3.1 *Singular categories*

For Visit 3 a single comment was made in reference to *Organisation* and *More schools*, which was not the case for Visit 2. Students were more familiar with their environment this time around and thus also more organised, as can be deduced from the feedback in Table 5.24. It can also be said that, perhaps, students had a greater sense of ownership of the project.

TABLE 5.24: SINGULAR CATEGORIES OF THE THEME *HOW CAN WE IMPROVE FUTURE VISITS?*

CATEGORY NO.	CATEGORIES (N=1)	RUBRIC NO.
Category 3.1	<i>Organisation</i>	2208
Category 3.2	<i>More schools</i>	2371

5.5.3.2 *Category clusters (without subcategories)*

Categories 3.3–3.13

Some learners indicated that giving *Freebies* would improve future interactions. Care should be taken to ensure that handing out free goodies does not negate the true purpose of the engagement. *More visits*, as discussed in Section 5.4.3.2, may give an indication of appreciation and a desire to learn. More visits may not only improve interaction with communities, but may also improve the relationships between partners and add value through regular feedback. More visits would also promote citizenship in students through personal empowerment from a belief in their ability to make a difference (Duckenfield & Swanson 1992:6).

During the third visit Grade 12 learners stated that using *Props* would improve the experience for them. This time around learners were not as specific as during the second visit. Though there were no subcategories in relation to *Handouts* during Visit 3, learners still believed that handouts would enhance the experience, and, as postulated in Section 5.4.3.3, having a physical reference would improve the lives of the learners; furthermore it could serve as a tool to spread the message. Some Grade 12 learners believed that *Teamwork* could be improved, which is achievable through increased *Practise*, where the cumulative effect will be an improvement and more effective SL engagement. Learners indicated that if students spent *More time* in the community it would increase the impact

of the intervention. This is feasible but is governed by the schools' schedules, schools' buy-in and having a more inclusive process of learning-outcomes establishment.

Because the Grade 12 cohort was still mixed (science and non-science learners) in some schools it is to be expected that some learners would ask that students *Simplify concepts* and use *Less technical terms* during future visits. *More relevant topics* related to both non-science learners and male learners, indicating that some of the topics covered during the presentation were not applicable to them.

There were also learners who said *Other communities* should be involved, indicating that this would not only improve future engagement, but would also lead to more effective SL, because more people would receive the message (2257, 2258, 2371).

5.5.3.3 Category clusters (with subcategories)

Category 3.14

Slides were mentioned in general, and specific references were made to the subcategories listed in Table 5.25.

TABLE 5.25: SUBCATEGORIES OF THE *SLIDES* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.14.1	<i>Graphics and videos</i>	2215, 2235, 2226, 2341
Subcategory 3.14.2	<i>Font size</i>	2359

More learners asked for *Graphics and videos* than during Visit 2. This implies that students should not only inform and educate, but also entertain and use a variety of methods to keep learners intrigued.

Category 3.15

As during Visit 2 (Section 5.4.3.3), *Presentation skills* was identified as an issue, but this time around it was cited less often, as can be seen in Table 5.26.

**TABLE 5.26: SUBCATEGORIES OF THE *PRESENTATION SKILLS* CATEGORY
(table continues on next page...)**

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.15.1	Eye contact	2206, 2215, 2298, 2328, 2329, 2372, 2374

Subcategory 3.15.2	<i>Body language</i>	2207, 2339, 2372
Subcategory 3.15.3	<i>Enthusiasm</i>	2230
Subcategory 3.15.4	<i>Clear voice</i>	2368
Subcategory 3.15.5	<i>Pronunciation</i>	2379
Subcategory 3.15.6	<i>Volume</i>	2215, 2242, 2251, 2298, 2368

The decrease in calls for improvement of presentation skills can be attributed to students being better prepared (due to experience gained during Visit 2), more familiar with the SL environment, being less anxious and more confident.

Category 3.16

More info can be an indication that some learners want to learn more, and that groups are not fulfilling their immediate needs. Considering the subcategory of the statement (cf. Table 5.27), some learners want to have more in-depth and weighted interaction with students.

TABLE 5.27: SUBCATEGORIES OF THE *MORE INFO* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.16.1	<i>More detail</i>	2330

Category 3.17

The number of learners calling for improved *Confidence* decreased between visits, thus indicating students' personal growth and increased self-awareness. The number of subcategories also decreased, as can be seen in Table 5.28. Grade 12 learners thus noted an increase in students' confidence and esteem as a product of personal growth, as premised by Duckenfield and Swanson (1992:6).

TABLE 5.28: SUBCATEGORIES OF THE *CONFIDENCE* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.17.1	<i>Relax</i>	2383

Category 3.18

The feedback collected from Grade 12 learners after Visit 2 did not have a *Nothing*, meaning nothing to improve, category. There were also expressions of satisfaction from Grade 12 learners, as demonstrated in Table 5.29.

TABLE 5.29: SUBCATEGORIES OF THE *NOTHING* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.18.1	<i>Everything was fine</i>	2104
Subcategory 3.18.2	<i>Improvement from last time</i>	2344
Subcategory 3.18.3	<i>Outstanding</i>	2281
Subcategory 3.18.4	<i>Perfect</i>	2272

The above statements confirm that communities had an overwhelmingly positive perception of universities in their area (Vernon & Ward 1999:32).

Category 3.19

The length of the visits and their frequency were influenced by the schools' schedules. Students were given free range to do what they wanted to achieve the learning outcomes, but Grade 12 learners indicated that the experience would have been of greater value if there had been *More interaction* between students and themselves. Grade 12 learners also made more specific requests and suggestions to improve interaction, as can be seen in Table 5.30.

TABLE 5.30: SUBCATEGORIES OF THE *MORE INTERACTION* CATEGORY

SUBCATEGORY NO.	SUBCATEGORIES	RUBRIC NO.
Subcategory 3.19.1	<i>Q&A</i>	2244, 2294, 2378
Subcategory 3.19.2	<i>Involve students</i>	2243, 2303, 2304

For Visit 3 there were some references to *Presentation* and *Communication skills* that Grade 12 learners believed needed attention, but the subcategories and frequency were fewer compared to Visit 2. Some Grade 12 learners asked for more *Explanation* to improve their understanding; they wanted *Props*, *Graphics* and *More interaction*. Their requests for *More visits*, *More schools*, *More info*, and *More time* indicate their individual appreciation and a general call for greater involvement by academic institutions. Compared to Visit 2, Visit 3 not only had fewer comments for this theme, but also included the category *Nothing*, which had four subcategories, including *Improvement from last time*.

5.6 VISITS 2 AND 3: CONTACT-PERSON ASSESSMENTS

The qualitative part of the contact person rubrics required the teachers at each of the five schools to explain why they believe that they and the Grade 12 learners either benefited

or did not benefit from the intervention. The five contact persons also had to provide advice on how to improve future visits.

The rubric thus assesses the following research questions (Section 1.4.3) and associated objectives:

2. To establish whether the community benefits from Radiography SL; and
4. To investigate the effectiveness of SL in allowing students to achieve the graduate attributes.

In relation to these objectives 20 samplings were estimated (Section 3.4.2.2) because the five schools were visited twice each over the study period. The second round of visits involved nine rubrics because the contact person at one of the schools was not available, giving us a return rate of 90%. Similarly, the return rate for the third visits was also 90% because the contact person at another school was not available.

5.6.1 Theme 1: YES answer

For both visits in 2012 and 2013, all the contact persons believed that both they and the grade 12's benefitted from the SL interaction (*cf.* Sections 4.4.4.4 & 4.4.5.4). The contact persons had to *Explain their answer* in reference to the quantitative questions, *Have you benefited from this experience?* and *Have the Grade 12 learners benefited from this experience?* In reference to this theme there were only Yes answers.

5.6.1.1 Categories 1.1 – 1.15

In 2012, one of the five contact persons at the five schools indicated that he/she and the Grade 12 learners benefited from the experience because it was *Interesting* (contact person rubric 1002). Two, one each for 2012 and 2013, said that the second visit presentation was *Good* (1002 and 3001). Similarly, two indicated that the third visit presentation was *Good* (2003, 2004) during 2012. During 2012, five contact persons, two during Visit 2 (1004 and 1005) and three during Visit 3 (2001, 2002 and 2003) were of the opinion that the presentations were *Informative*.

There were also cases where three contact persons believed that the experience went beyond being *Interesting*, *Good* and *Informative*, and was *Educational* (1005, 3002 and 3003). Another contact person went further by saying that he/she gained *Valuable info*

(4002); this was during the third visit of 2013. In comparison, *Educational* and *Valuable info* indicates a higher-level experience than *Informative* or *Good*.

During the third visit of 2013, a different contact person indicated that he/she and the Grade 12 learners *Benefited a lot* (4001) from the experience. Some of the contact persons were also of the opinion that *Concepts were explained very clear, better understanding* (4004 and 4005) and that *All questions were answered* (4005). Other statements include, *Visual orientation (use of colours), Slides comprehensive, explains subject matter, especially if this is first knowledge*.

Contact persons also reported that the information presented was *Relevant* (1002, 1003, 2001 and 2002). Unlike the case for the Grade 12 learners no subcategories were identified for this category, but keeping the student cohort in mind, one can safely speculate that *Relevant* refers to both academic and personal contexts. As with the Grade 12 feedback, the contact persons also referred to the application of knowledge and the relevance of curriculum (Duckenfield & Swanson 1992:6).

One contact person indicated that he/she and the Grade 12 learners benefited from the experience because of the *Teamwork* (2003) displayed by the students. The contact person stated that students exhibit social growth in their ability to work cooperatively with others.

The reasons why they benefited from the experience given by the contact persons differs from those of the Grade 12 learners. The Grade 12 learners were more revealing in their replies in that they referred to specific graduate attributes (communication, working well with others, using science and technology, high level of information literacy, etc.). This is good, because it reveals different perspectives of addressing the objective relating to whether the community benefits from Radiography SL.

5.6.2 Theme 2

The contact persons were asked, *How can we improve future visits?* in reference to the quantitative question, *Have you benefited from this experience?*

5.6.2.1 *Categories 2.1 – 2.7*

The students' *Presentation skills* (1002) were identified by one contact person as needing improvement. Other feedback received from contact persons, such *Language, use of slang, gonna, wanna* (4004), *Use a pointer* (1002 and 3002) and *Time management, intervention* (4001) can be subcategorised under *Presentation skills*. These comments also related to some of the graduate attributes, specifically communication and management.

As the Grade 12 learners did, some contact persons asked for *More info* (1004 and 3003) and *More visits* (2001). The purpose of the SL intervention was to assist communities by spreading health-related information. The aforementioned requests for *More info* and *More visits* not only indicate the communities' perceived value of SL, but it also strengthens the case for more rigorous community-based initiatives.

During the third visits of 2012, two contact persons (2003 and 2004) said that *Nothing* needed improvement. This response could mean that they believe that, as a collective, we have reached our common goal of benefiting.

5.7 VISIT 2: RADIOGRAPHY STUDENTS' REFLECTION RUBRICS AND REFLECTION DISCUSSION

The reflective rubric completed by students after the second visits of 2012 and 2013 consisted of three sections: *Academic Learning and Enhancement Domain, Personal Growth and Social Responsiveness Domain and Management Point of View*. The same rubric was used during the discussions with each group after the intervention.

The rubric and discussion thus assessed the following research questions (Section 1.4.3) and associated objectives:

2. To establish whether SL cultivates social responsiveness in students; and
5. To analyse whether reciprocity is achievable when doing SL in Radiography.

During Visit 2 in 2012, 25 rubrics were distributed among Radiography students; 22 returned the rubric, giving a return rate of 88%. The return rate for the same visit during 2013 was 97% (42 returned from 43 distributed).

For each theme of the reflective rubric the singular categories are presented first with rubric reference. Category clusters with less than 10 entrants are presented with rubric references in table format and, finally, category clusters with more than 10 representatives are presented without rubric references. Yes/No categories are presented with rubric references in table format. The feedback from the interviews with students is presented per category.

Themes 1 to 12 were questions encouraging students to examine and analyse the SL experiences from the *Academic Learning and Enhancement Domains*.

5.7.1 Theme 1

With regard to reciprocity, students were asked, *What did you learn from the scholars?* For this theme category clusters with fewer than 10 entrants and category clusters with more than 10 entrants were achieved.

5.7.1.1 Category clusters <10 entrants

Table 5.31 presents the category clusters with fewer than 10 rubric references for the theme. Most of the feedback received from the students did not answer the question; the feedback relates more to how students were supposed to interact with the Grade 12 learners in order to have a successful engagement. Students were of the opinion that they could not learn anything new from the Grade 12 learners, because the learners possess only basic knowledge.

TABLE 5.31: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 1.1	<i>Presentation should be interesting</i>	2015, 2017, 2041
Category 1.2	<i>Grade 12 learners' basic knowledge</i>	2008, 2010, 2011, 2016, 2018, 2019, 2042
Category 1.3	<i>Have to simplify info</i>	1004, 1012, 2013, 2020
Category 1.4	<i>Patience</i>	1007, 1021

Student rubric 2011 (Category 1.2) presented a different interpretation of basic knowledge by adding, *can't elude them by talking nonsense*. In contrast to the other students, the student who completed rubric 2018 (Category 1.2) mentioned that Grade 12 learners *had more knowledge than me in relation to nuclear medicine*. In this instance it can be confirmed that there was reciprocity through a mutual exchange of information.

5.7.1.2 Category clusters >10 entrants

Category 1.5

Most students said that they learned *Nothing* from the community. Bear in mind that there were science learners amongst the Grade 12 group, but that their level of knowledge was not at tertiary level, as that of the Radiography students was. Considering the audience and the fact that Radiography is very specialised field of study, this was, to some extent, to be expected.

Category 1.6

Though *Attentiveness* does not relate to learning something academic, it is a vital component of learning. For this category there was a great deal of feedback.

5.7.1.3 Reflection discussion

A range of similar answers were given during the interviews with the student groups. Comments included, *Not really anything, It was an informative session for them and they were very attentive but we did not learn anything.* Other statements were, *Didn't learn anything. The Grade 12s were eager and it motivated us and Nothing, we taught them.*

Students also gave reasons why this was the case. *The scholars said we spoke in terms they didn't understand. There were Economics learners, and Because we didn't ask questions.*

5.7.2 Theme 2

The second question was, *What did you learn from your fellow students?* Theme 2 provided one singular category, category clusters with fewer than 10 entrants and category clusters with more than 10 entrants.

5.7.2.1 *Singular categories*

Category 2.1

The student who completed rubric 2040 was the only student who said, *Not much*, meaning that he/she did not learn much from his/her fellow students.

5.7.2.2 *Category clusters <10 entrants*

All the feedback for these category clusters relate to non-academic learning and relates more to presentation skills and personal development, as can be seen in Table 5.32.

TABLE 5.32: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 2.2	<i>Presentation skill</i>	1020, 2017, 2031
Category 2.3	<i>Time management</i>	2025, 2036
Category 2.4	<i>Confidence</i>	2010, 2016, 2022, 2033

5.7.2.3 *Category clusters >10 entrants*

The feedback with the highest frequency is in one of two categories, academic work and teamwork.

Category 2.5

During Visit 2 many students indicated that they learned *academic work* from their fellow students. Through collaboration with more knowledgeable peers, students were able to improve own understanding. This was specifically in relation to *Ca, radiation protection, mamma self-examination*. Students have been exposed to some of these themes, but not all, and through self-discovery and interaction with others, they were able to grasp new concepts.

Category 2.6

Teamwork was another form of non-academic learning that students indicated took place—this could be considered the development of a generic skill. The large volume of

feedback relating to teamwork correlates with the presumption that SL does not necessarily produce academic learning (Bringle & Hatcher 2005:27).

5.7.2.4 Reflection discussion

Learning through collaboration with others was confirmed during the interviews with students. *By hearing them speak about it reinforce the work in your mind; You learned from them in simpler terms by listening to the way they understood it; I think I learned that they were willing to help when you had problems, tutoring; Concepts were clarified; When we had the rehearsal I learned a few things.* Other student groups were of the opinion that, *Yes, everyone had a different take on the concept and they helped you to understand something you didn't before; There were some instances where I did learn new things that I did not now before.* The impact of doing research and promoting new insights through collaborative learning was also demonstrated by students explaining, *All did their own part of the outcomes; When we came together there were things we learned from the students which made it easier in class. Like self examination.* At that stage of the year some of the outcomes related to mammography had not been presented in class.

5.7.3 Theme 3

Students' feedback for the theme: *What differences are there between the academic materials as presented in the course, and what you discovered during preparation and execution of the presentation?* is presented in Sections 5.7.3.1 - 5.7.3.4.

5.7.3.1 Singular categories

Category 3.1-3.2

Not much (2019) and *Not significant* (2019) was feedback by the same student when answering whether there were any differences between class work and what they discovered on their own. Only one student said this, thus indicating that that not all agreed. The significance of these differences will be considered in Theme 4.

5.7.3.2 Category clusters <10 entrants

In Table 5.33 differences experienced by students are given.

TABLE 5.33: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 3.3	<i>Graphics</i>	1003, 1011
Category 3.4	<i>Yes</i>	1009, 1013
Category 3.5	<i>More sources</i>	1003, 1007, 1012, 1018, 1020, 2002, 2005, 2013, 2030, 2035
Category 3.6	<i>Practical</i>	2015, 2018, 2029, 2039

The differences listed above relate to the purpose of the exercise and the differences in the teaching and learning strategies; there was no difference in relation to the concepts as presented in class. These differences were thus complementary and not contradictory and were explicitly implied during orientation.

5.7.3.3 Category clusters >10 entrants

Category 3.7

SL simplifies was the opinion of a large proportion of the sample. Simplification relates to student self-discovery through research, the use of more sources, and collaborative learning. It also relates to the fact that students had to improve own understanding before they could explain it to less knowledgeable Grade 12 learners.

Category 3.8

Many students stated that there were *No* differences between the class work and what they discovered. The value of continuous revision of learning outcomes and study material already provided the students with holistic knowledge and the differences complemented pre-existing knowledge.

5.7.3.4 Reflection discussion

The feedback provided in the reflection rubrics was again confirmed by student comments: *No real difference same type of work just put in a different way.* Other comments were *More or less the same, and number; The same work; Principles were the same; The interpretation were different but the principles the same; But because it was simplified it helped.*

Because some mammography concepts had not been handled at that stage, there were also comments such as, *Yes. In class we didn't clarify on the indications of mammograms, so when I researched I learned a few things; The extra information helped, and Scheduling with Clinical important; self discovery because we have not done mammo yet.*

5.7.4 Theme 4

The variety in responses in Theme 3 needed to be clarified, so students were asked, *Are these differences significant enough to alter the outcomes of the learning units?*

TABLE 5.34: SIGNIFICANCE OF DIFFERENCES

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 4.1	<i>Yes</i>	1003, 1005, 1009, 1010, 1014, 1016-1018, 1020, 2009-2014, 2018, 2021, 2023, 2029
Category 4.2	<i>No</i>	1002, 1006-1008, 1011-1013, 1015,1019, 2001-2008, 2015-2017, 2019, 2020, 2022, 2024-2026, 2027, 2030-2042

SL structured reflection links the students' service experiences to exit-level outcomes, specific outcomes, graduate skills, and objectives of the course (Hurd 2006:Online). Clearly, more students believed that the differences between the academic material as presented in the course, and what they discovered during preparation and execution of the presentation, was not significant.

5.7.4.1 Reflection discussion

Student groups that were interviewed answered *No* when asked whether the differences mentioned were significant. They explained further: *In class it is more educational specifically for Radiography students and we had to get simpler info for them, and Not really. In the class we go into detail; When were present to people who were not studying radiation etc. we had to do only superficial (simplify) research; it helps a lot to understand; We must not change the outcome because is for us how we are supposed to learn. The preparations were for people who didn't know much. Simplify for them.*

5.7.5 Theme 5

What are the possible reasons for differences? was the next question.

5.7.5.1 *Category clusters <10 entrants*

TABLE 5.35: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 5.1	<i>Student self-discovery</i>	1011, 1016, 2016, 2018, 2021, 2023, 2029, 2033

Students indicated that because the *Mammography was not done in KLD30AT*, they had to do a great deal of self-discovery in relation to those outcomes (rubric 2021).

5.7.5.2 *Category clusters >10 entrants*

Category 5.2-5.4

Feedback of this question by students had a strong link to Theme 3's feedback. This included *SL simplify*, *More sources*, and *No difference*.

5.7.5.3 *Reflection discussion*

Confirmation statements during interviews included, *We had to simplify it for them so they could understand it also improved our understanding*, and *The additional sources were different*.

5.7.6 Theme 6

Students were asked to make suggestions for how the differences identified in Themes 3 and 5 could be addressed: *How could these be addressed?*

5.7.6.1 *Singular categories*

Seven singular categories were identified.

Categories 6.1-6.7

Singular feedback from students suggested, *More dress rehearsal* (2011), *More studying* (1013) and *More creativity from students* (1011), which can be classified under preparation. Issues that could be addressed in the curriculum, according to students'

feedback, were *More sources* (1003), the use of a *Community consultant* (2015) and the *Correlation of schedules of modules* (2021). One student suggested that the way in which students interacted with the community required a *Positive attitude* (2037).

5.7.6.2 *Category clusters <10 entrants*

The categories mentioned in Table 5.36 reflect areas that could be addressed in class.

TABLE 5.36: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 6.8	<i>Lecturer assistance</i>	1013, 1019, 2013, 2024
Category 6.9	<i>Classes more practical</i>	1020, 2016, 2024, 2025, 2029, 2036, 2038, 2040
Category 6.10	<i>Simplify classes</i>	2003, 2012, 2014, 2023, 2031
Category 6.11	<i>Research assignments</i>	2005, 2018, 2027, 2041

Three of the categories (6.9-6.11) related directly to the manner in which the SL was rolled out, its purpose and the way the audience was engaged. At least four students indicated that more interaction with the lecturer was needed to address and clarify differences. It is thus clear that the manner in which formal classes are presented should change by being more practise orientated and by allowing for self-discovery through a student-centred approach.

5.7.6.3 *Category clusters >10 entrants*

Category 6.12

A large proportion of the students who completed the reflection rubric were satisfied with the course as it is, and said that there was *Nothing to address*.

5.7.6.4 *Reflection discussion*

Suggestions for addressing differences were made during the interview. These included, *The introduction of the lecture is the simplified part more attention should be given to this; We also do demonstrations, and Maybe just the book could be simpler, the book is not always clear.* Adding to these statements, other groups suggested, *I think more sources must be used from outside should be combined with the course, and It is*

awkward to do the presentation before we have covered it in class. A lot of stuff we had to find out for ourselves. Maybe change the schedule?

5.7.7 Theme 7

The purpose, planning and rollout of SL should be structured so that service and civic engagement is used to integrate and enhance academic learning, but does not replace it. Themes 7-12 were questions targeted at student experiences that were specific to outcomes, theories and concepts. The first question asked, *How has this experience enhanced your knowledge of specific outcomes, theory or concepts?* The results of the *Yes* answers are presented in 5.7.7.1 - 5.7.7.4, and the single *No* answer in 5.7.7.5.

5.7.7.1 Singular categories: YES

Categories 7.1-7.3

Individual students said that their knowledge had been enhanced because of *Interesting facts* (1001), through *Self discovery* (2042) and that access to more sources made *More knowledge* (2040) possible.

5.7.7.2 Category clusters <10 entrants

As seen in Table 5.37, having been exposed to outcomes, theories and concepts during class, students' knowledge had been enhanced through repetition. SL enabled students to create their own knowledge during preparation and to come to new insights and/or to reinforce their knowledge through interacting with group members.

TABLE 5.37: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 7.4	<i>Revision</i>	1015, 2010
Category 7.5	<i>Preparation</i>	1003, 1009, 2004, 2010, 2024, 2032, 2038
Category 7.6	<i>Collaborative learning</i>	2023, 2033

In relation to preparation (Category 7.5, rubric 2038), the students stated that *Ability to do research* enhanced their knowledge. As mentioned earlier, SL enables students to engage in collaborative research and in this way strengthen their academic learning and civic competencies (Hurd 2006:Online).

5.7.7.3 Category clusters >10 entrants

Categories 7.7 - 7.9

The large categories for this theme were *Simplification towards improved understanding*, *Clarify outcomes* and *Additional info*. The purpose, planning and rollout of SL should be structured so that it uses service and civic engagement to integrate and enhance academic learning, but does not replace it (Hurd 2006:Online).

5.7.7.4 Reflection discussion

Similar results were found during the interviews. In reference to revision: *Yes it did. Again reinforcement of what we've learned in class*, and in reference to collaborative learning: *Yes. When I interacted, I was corrected in something and it improved my understanding*, and, *Also better understanding because we had to explain it to other people and working with the other people in the group it also improved the understanding of the other concepts the other people were in charge of; There were things I didn't know before.*

This viewpoint was also reflected in comments such as, *Explaining things to some-one else made it better. If it is done by colleagues, you understand better, because we use the same language; We have to simplify it; You have to be thoroughly prepared.* Students also indicated the value of self-discovery through doing research: *We did research and we had a better understanding.*

5.7.7.5 Singular category: NO

The feedback from the student who answered *No* was as follows.

Category 7.10

For Visit 2 only one student reported that the experience *did not enhance my knowledge* (2035).

5.7.8 Theme 8

Does it reinforce your prior understanding?

TABLE 5.38: REPLIES TO THEME 8'S QUESTION

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 8.1	<i>Yes</i>	1001, 1002, 1006-1017, 1018, 1020, 1021, 2011-2018, 2027-2032, 2034, 2036-2042
Category 8.2	<i>No</i>	1005, 1019, 2033, 2035

From Table 5.38 it is clear that more students believed that the SL intervention reinforced their prior understanding of the course work than did not.

5.7.8.1 Reflection discussion

All five student groups agreed that this experience reinforced their knowledge of specific outcomes, theory or concepts; they all replied *Yes* to the question.

5.7.9 Theme 9

Students had to clarify their answers to Theme 8's question by answering, *In what ways?* Table 5.38 included four *No* answers, but unfortunately these students did not indicate why they believed this way.

5.7.9.1 Singular categories

Categories 9.1-9.2

One student said that his/her knowledge had been reinforced, because he/she *Know now what I did not know* (2013), compared to another student who said that the experience served as *Positive reinforcement* (2006).

5.7.9.2 Category clusters <10 entrants

Students gave similar feedback to that given for the theme of enhancement of knowledge; this can be seen in Table 5.39.

TABLE 5.39: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 9.3	<i>Student study, self-discovery</i>	2029, 2038, 2040
Category 9.4	<i>Knowledge broadened</i>	2032, 2034
Category 9.5	<i>New information</i>	2021, 2022, 2025, 2031
Category 9.6	<i>Revision</i>	1001, 1009, 1012, 2018
Category 9.7	<i>More sources</i>	1017, 2024
Category 9.8	<i>Collaborative learning</i>	1017, 2002, 2011, 2013

Students indicated that having to do research and collaborating with others reinforced their knowledge and because there were no significant differences between their discoveries and the class work, the different perspectives of the work presented can be viewed as revision.

5.7.9.3 Category clusters >10 entrants

Categories 9.9 and 9.10 represent the feedback from the student reflection rubrics with the highest frequency.

Categories 9.9 - 9.10

As mentioned earlier students were of the opinion that they could only have an effective presentation if they understood what they presented. This was facilitated by obtaining *More detail during preparation* through the use of additional sources. In this instance doing more preparation enabled *Simplification towards improved understanding*.

5.7.9.4 Reflection discussion

Students interviewed cited *Revision* as a reason for reinforcement of knowledge. Gaining a different perspective of the learning material through the use of more sources and tailoring the information for easy consumption was a consequence of simplification: *When some of the work had to be simplified you have to understand it deeply; Had to simplify and not go astray, and We have to be better prepared and had to understand what we were talking about; Because they ask questions; Had to keep the audience in mind as well.*

5.7.10 Theme 10

The next question investigated if the different aspects of SL, namely, planning, preparation, research and execution, caused students to develop a different understanding of the academic work, by asking them, *Does it challenge your prior understanding?*

TABLE 5.40: RESPONSES FOR THEME 10

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 10.1	<i>Yes</i>	1003, 1005, 1007, 1009, 1014, 1015, 1018, 1020, 2003, 2005-2013, 2015-2017, 2020, 2021, 2027, 2029, 2031, 2033, 2036-2038, 2040-2042
Category 10.2	<i>No</i>	1001, 1002, 1006, 1008, 1010-1013, 1017, 1019, 1021, 2001, 2002, 2014, 2019, 2022, 2023, 2025, 2026, 2028, 2030, 2032, 2034, 2035, 2039

From Table 5.40 it is clear that the majority of students believed that the SL intervention challenged their prior understanding of the course work. The students' feedback reflects what Hurd says: SL combines content-driven, outcomes-based commitments with opportunities for learning and knowledge growth from students' service experiences through all the different stages of execution (Hurd 2006:Online).

5.7.10.1 Reflection discussion

Three of the five groups interviewed agreed with the results presented in Table 5.40 by answering *Yes*. One group explained further: *Those modules we haven't yet cover, we did the research and discovered on our own what it meant.*

5.7.11 Theme 11

For Theme 11, students had to clarify their responses in Theme 10 by replying to the question, *In what ways?*

5.7.11.1 Singular categories

Categories 11.1 - 11.5

Doing research did not only enhance and reinforce students' prior knowledge; it also presented ideas that challenged students' understanding, as can be seen in the comments

by two students, *More research* (2021) and *Additional information* (2036). Another student indicated that his/her knowledge had been challenged when he/she interacted with other members of the group, *Collaboration* (2011). This was emphasised by other comments, such as *Diverse knowledge in group*.

One student believed that he/she had been challenged on a personal level and responded to the question by saying, *Self believe in my understanding vs. Grade 12 understanding* (1015).

5.7.11.2 *Category clusters <10 entrants*

The factors that challenged most of the students in the sample are presented in Table 5.41. Upon closer inspection it is clear that these factors are closely associated with the teaching and learning format and the intended goal of community beneficence.

TABLE 5.41: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 11.6	<i>Clarify information for Grade 12 learners</i>	2008, 2014, 2015, 2020, 2038
Category 11.7	<i>Same concepts as in class</i>	1022, 1013
Category 11.8	<i>More detail</i>	1003, 1009, 1014, 1016, 1018, 1020, 2010, 2012, 2017, 2021
Category 11.9	<i>Learning orientation changed</i>	1007, 1010, 1011
Category 11.10	<i>Looking forward to knowing more</i>	2013, 2037
Category 11.11	<i>Understanding increased</i>	2016, 2017, 2029, 2030, 2032, 2033
Category 11.12	<i>Having to simplify</i>	2003, 2006, 2008, 2009

In reference to the challenges, students had to adapt their learning orientations, which is evident from students adding, *practical thinking; improved my understanding*. Students were confronted by complex problems, had to apply problem-solving skills to new situations and developed a deeper understanding of subject matter (Hurd 2006:Online).

5.7.11.3 *Reflection discussion*

The group interviews reiterated the sentiments students provided in their reflection rubrics. Students again mentioned that their knowledge had been challenged because they had to simplify information.

We had to simplify it for matriculants to their level so that they can understand it; we couldn't give in on our terms; Before we understood it clearly but explaining it to them it also improved our understanding; I forgot certain things that I was reminded of.

Another group responded by saying,

It was challenging because working at a tertiary level you have to understand things at a certain level but when you start to present to a lower level you have to change your mind set; Sometimes when I explained it in another way I understood it better.

Their knowledge was also challenged by the collaborative learning during group interaction: *We gain more knowledge of stuff we didn't now before. The interaction with the group helped.*

5.7.12 Theme 12

To end the section on reciprocity, students were asked, *What additional information would you need to put yourself in a better position to understand the module content better?*

5.7.12.1 Singular categories

Category 12.1 - 12.6

One student was of the opinion that *More info* (2004) would put him/her in a better position to understand the module content better. The aforementioned comment, as well as two other students mentioning *Classes more structured like SL* (2020) and *More research* (2032) begs for a rethinking of the way classes are facilitated; classes should be more student centered and less paternalistic.

Individual students also called for *Interaction with cancer survivors* (2042) and the *Use of external consultants* (1018). Using research and working in partnership with people not connected to the academic institution could provide different viewpoints and thus strengthen knowledge and contribute positively to the purpose of the SL interaction. Another student hinted from a more personal context that *Practice* (2029) would improve their knowledge of the learning outcomes.

5.7.12.2 *Category clusters <10 entrants*

The feedback in Table 5.42 refers directly (Category 12.7) and indirectly (Categories 12.8-12.10) to the challenges associated with the prescribed textbook.

TABLE 5.42: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 12.7	<i>Understandable learning material</i>	2015, 2036
Category 12.8	<i>Self-discovery</i>	2039, 2041
Category 12.9	<i>Practical examples</i>	1001, 1010, 1014, 1019, 2002, 2021, 2033
Category 12.10	<i>The use of articles</i>	1001, 2007

Students indicated that a variety of sources and approaches to teaching and learning would facilitate better understanding of the module content.

5.7.12.3 *Category clusters >10 entrants*

The categories with the greatest number of student responses for this theme are shown below.

Categories 12.11 - 12.12

The shortcomings of the prescribed textbook and the SL acquired comprehensive view of concepts were illustrated by most students asking for *More sources*. This was confirmed by one student, who added, *Simpler sources* (2011). In contrast to the evidence presented in Sections 5.7.12.1 - 5.7.12.3, a large number of students believed that *Nothing additional is needed*.

5.7.12.4 *Reflection discussion*

The alternate approach to teaching and learning was also requested during the interviews: *More research projects*. This request must, however, be considered in context, because one group had the following opinion: *Not really. There is additional info on BlackBoard, you just have to access it*.

The major effect of SL in reference to the *Academic Learning and Enhancement Domain*, articulates around self-discovery, collaboration with others and simplifying information.

The learning experience was also enhanced through revision, but the interplay between teaching and learning amongst students and community members did not happen. As stated in section 2.9.5 all parties involved function as both teacher and learner; without this relationship there is the risk of exploitation, one party alone does not hold all the power in the relationship (Donahue, Bowyer & Rosenberg 2003:17). Again, this begs the question of redefining reciprocity.

The questions of Themes 13 to 30 ask students to examine and analyse the SL experiences from the *Personal Growth and Social Responsiveness Domains*.

5.7.13 Theme 13

The first question for this domain asked students, *How did this experience make you feel (positive and/or negative)?*

TABLE 5.43: RESPONSES FOR THEME 13

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 13.1	<i>Positive</i>	1001-1006, 1008-1018, 1020, 1021, 2001-2027, 2029, 2031-2033, 2035-2037, 2039-2042
Category 13.2	<i>Negative</i>	1007, 1014, 1019, 2018, 2028, 2030, 2038

Most of the students experienced the second visit positively, as reported in Table 5.43. Students indicated that they were nervous and a bit anxious, but that the overall experience was good.

5.7.13.1 Reflection discussion

In the student interviews three groups indicated that it was a *Positive* experience, and two groups experienced it *Negatively*. From students themselves feedback was, *For some negative, and positive*. This was the first presentation in the community, it was an unfamiliar setting and situation and students did not know what to expect. There was definitely some apprehension that later evolved into confidence, as suggested by student comments such as, *I didn't like public speaking; I went up and went down again but the end result was positive*, and *For me it was positive because I am shy and had to challenge myself and I delivered*. These statements prove that students experienced personal development as a result of their interaction with the community.

5.7.14 Theme 14

The follow-up question, *Should you have felt differently?* required the students to evaluate themselves and the experience; the results of this assessment is shown in Table 5.44.

TABLE 5.44: RESPONSES TO *SHOULD YOU HAVE FELTED DIFFERENT?*

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 14.1	<i>Yes</i>	1004, 1014, 1019, 2002, 2006, 2012, 2013, 2015, 2018, 2022, 2036, 2038
Category 14.2	<i>No</i>	1001-1003, 1005, 1006, 1009-1013, 1015, 1017, 1018, 1020, 1021, 2001, 2003, 2005, 2007-2011, 2014, 2015, 2017, 2019, 2021, 2023-2035, 2037, 2039-2041

Ten (1004, 2002, 2006, 2012, 2013, 2015, 2018, 2022 and 2036) of the students who indicated that they felt positively about the experience said that they should have felt differently. Only three (1014, 1019 and 2038) students who indicated that it had been a negative experience said that they should have felt differently. The reason for this change of heart will become clear in Section 5.7.15. We can deduce from this that students' responsiveness to the community was challenged and through introspection, *I only wanted to be positive* (1014), personal growth was a consequence. One student who said they should not have felt differently added, *At first the experience was negative, but it changed* (2028), again illustrating that apprehension evolved into self-belief.

5.7.15 Theme 15

The reasons given in response to the question of *Why?* in relation to Theme 14, *Should you have felt differently?* are discussed below.

5.7.15.1 *Singular categories*

Categories 15.1 - 15.7

One student said that he/she was correct in not feeling differently, because we *Empower the community* (2035). Another student was of the opinion that the interpretation of the experience as positive was correct because the *Outcome was good* (2024). This positive reinforcement experienced by students can be seen as the prelude to social responsiveness. Another student added, *We were prepared* (2025), and the experience

thus had to be positive. Two students did not hesitate to say that the experience had been positive, because it was an *Opportunity for growth* (2041) and that their *Skills enhanced* (2004).

One of the 10 students who said that they should not have felt positively about the experience qualified this statement by confessing they *felt superior* (2036). Reflection enabled students to evaluate their experiences, to make sense of it and to define themselves within the community context.

One of the three students who indicated that they should have felt positively about the experience, attributed their personal struggle to the fact that *I was prepared, but did not present* (2038). In the absence of problems, such as double booking of the venue, the student would have had a different experience.

5.7.15.2 Category clusters <10 entrants

The categories with fewer than 10 rubric references are presented in Table 5.45.

TABLE 5.45: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 15.8	<i>Sharing information with the community</i>	2005, 2008, 2019
Category 15.9	<i>Giving back to the community</i>	2009, 2011, 2014
Category 15.10	<i>Positive reinforcement</i>	1003-1005, 1016, 1020, 2015, 2033, 2037
Category 15.11	<i>Fear of public speaking</i>	2012, 2013, 2018, 2022, 2031, 2034
Category 15.12	<i>Personal growth</i>	2032, 2033
Category 15.12	<i>New experience</i>	1001, 2006
Category 15.14	<i>Exciting experience</i>	1001, 1009, 1021
Category 15.15	<i>Community benefits</i>	1006, 1009, 1010, 1012, 1018, 1021
Category 15.16	<i>Enhances community knowledge</i>	2001, 2003
Category 15.17	<i>Tolerance</i>	1014, 1019
Category 15.18	<i>Sharing knowledge</i>	2026-2028
Category 15.19	<i>Improve knowledge</i>	2027, 2032
Category 15.20	<i>Help others</i>	2029, 2032

The students who said that the experience was positive, but that *they should have felt differently*, gave the following reasons for changing their minds: *Fear of public speaking*, *New experience*. When the students who gave negative responses were asked why they

thought that they should have felt differently, they replied that they should be more *Tolerant* with others.

5.7.15.3 Category clusters >10 entrants

Category 15.21

Most of the feedback associated with the reasons why students were of the opinion that they should have had different experiences refers to their ability to review what had happened, and trying to find ways to improve their future experiences, expressed as *Overcome fear of public speaking*.

5.7.15.4 Reflection discussion

Reasons for students having positive experiences given by the students were, *I felt dominant, people used to present to us, now it's my turn; I got to interact with the students and gave back to the community; and It was the right feeling, a bit scary*.

During the interview students gave the following reasons for negative experiences:

The idea to present itself was a challenge. We don't want to do it again. Some students can do presentations. We only ever done a presentation once, we missed it a few times had no experience.

It would be nice if we could interact with the scholars more. We thought we had to do the presentation a certain way, we didn't realise we could have done it differently. Next time we can do what we want. Maybe just do a dress rehearsal before.

Though some students had negative experiences, they were able to identify reasons for this and they also suggested ways to improve future encounters. This proves that SL enables students to become successful, productive members of an enriched society (Duckenfield & Swanson 1992:5).

5.7.16 Theme 16

When asked, *Did you, or did you not, experience difficulty working/interacting with your group?* students had mixed responses. These results can be seen in Table 5.46.

TABLE 5.46: RESPONSES TO QUESTIONS WHETHER STUDENTS EXPERIENCED DIFFICULTIES DURING GROUP INTERACTION

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 16.1	<i>Yes</i>	1003, 1005, 1008, 1009, 1011, 1019, 1020, 2002-2008, 2011, 2019, 2024, 2026, 2027, 2029, 2030, 2037, 2039, 2040, 2042
Category 16.2	<i>No</i>	1001, 1002, 1004, 1006, 1007, 1010, 1012, 1013-1018, 1021, 2001, 2009, 2010, 2012, 2018, 2020-2023, 2025, 2028, 2031-2036, 2038, 2041

The feedback suggests that there had been problems during group interaction, and comments such as, *They were dedicated and responsible* (2023) suggest that the problems were not that serious.

5.7.16.1 Reflection discussion

The above deduction was given more impetus during the interview, when students commented, *There were challenges but in the end it came together*, and *Problems in the beginning, success in the end*. During the interviews mixed reactions to the question also surfaced, with one group replying, *No problems with each other*, and another group stating, *Yes. Not everybody did what they were supposed to, they didn't care. In the end everybody woke up*. This mixed feedback made it difficult for the researchers to reach clear conclusions in relation to the posed question. From individual student comments during the interviews, this mixed reaction applied to individuals, rather than the group: *I was disappointed how one member presented they could do better*.

5.7.17 Theme 17

Students had to give answers a similar question as in Theme 16, but this time they had to evaluate their interaction with the community: *Did you, or did you not, experience difficulty working/interacting with the community?*

TABLE 5.47: RESPONSES TO QUESTION WHETHER STUDENTS EXPERIENCED DIFFICULTIES DURING COMMUNITY INTERACTION

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 17.1	<i>Yes</i>	1005, 1013-1015, 2001, 2007, 2009, 2012, 2015, 2019, 2025, 2026, 2029, 2036, 2039, 2040, 2042
Category 17.2	<i>No</i>	1001-1004, 1006-1011, 1016, 1017-1021, 2002, 2003, 2005, 2010, 2011, 2013, 2014, 2016-2018, 2020-2024, 2027, 2028, 2030-2034, 2035, 2037, 2038, 2041

Though there were mixed responses to the question, it is evident from Table 5.47 that there were more *No* responses. Most students did not experience any difficulty working with the community. This can be due to the students being open to new experiences, to good planning and tolerance of differences, either because students are more socially responsive and/or because the community was open and receptive to student efforts. It also illustrates that the participants were able to move beyond identities and move towards affinities through the sharing of valuable knowledge (Donahue *et al.* 2003:17).

5.7.17.1 Reflection discussion

Most of the interview feedback indicated that students did not have any problems interacting with the community, as evidenced by comments such as *No* and *We did not*. Due to the venue issue mentioned earlier, the group affected said, *Bad experience because we were stopped, but it was fine. They (Grade 12 learners) were very interested in us.*

5.7.18 Theme 18

Students then had to evaluate their interactions with the group and make suggestions in reference to the question, *What could you do differently next time to minimise such difficulties or further improve on the relationships in the group?*

5.7.18.1 Singular categories

Categories 18.1 - 18.6

One student took ownership by indicating that he/she will *Motivate others* (2009); in the same vein another student said that group members should *Help each other* (2042). Individual students touched on interpersonal issues such as *Trust others* (2024) and *Be*

more assertive (2029). These comments have a personal-growth undertone and link good group dynamic to improving group interactions.

The aforementioned connection is also visible in the following student responses: *Choose a leader* (2006) and *Proper rehearsal* (2024). The comments link good group preparation to improving group interaction.

5.7.18.2 Category clusters <10 entrants

From Table 5.48, it is clear that seven of the 10 categories presented relate to planning and two of the 10 are related to interpersonal skills.

TABLE 5.48: CATEGORY CLUSTERS <10 ENTRANTS
(table continues on next page...)

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 18.7	<i>Group communication</i>	1003, 1005, 1018, 1020, 2004, 2011, 2014, 2015, 2031, 2039, 2042
Category 18.8	<i>Group cooperation</i>	2003, 2004, 2006
Category 18.9	<i>Respect others opinion</i>	2002, 2005, 2012, 2026
Category 18.10	<i>Better preparation</i>	2020, 2023
Category 18.11	<i>Time management</i>	1011, 1012, 1020
Category 18.12	<i>Group support</i>	1006-1009, 1019
Category 18.13	<i>Punctuality</i>	2002, 2011, 2038, 2042
Category 18.14	<i>Improve teamwork</i>	2029, 2030
Category 18.15	<i>Tolerate diversity</i>	2005, 2012, 2013, 2022, 2027, 2029, 2042
Category 18.16	<i>Nothing</i>	1001, 1002, 1013, 1014, 1016, 2001, 2034, 2041

Eight students were of the opinion that *Nothing* needed to be done to minimise difficulties when interacting with group members. These students thus indicated that there were no or minimal difficulties.

5.7.18.3 Reflection discussion

To improve group dynamics and interaction, a variety of suggestion were made by students during the interviews. These included better scheduling and time management, *Setting up the time to meet we found it difficult to stick to the time; We were not strict, people also had other priorities; We all worked at different hospitals had to do it in holidays which made it difficult to get together and get information; Time management as well.*

Another group added, *We should make a time table ahead of time and stick to it; Early preparation, time management; There must be a group leader who can coordinate everything.* Preparation was also cited as a problem, and students suggested, *We should split up the work; The stronger persons can do the presentation; We were not informed enough about what we can or can't do.* Another comment in reference to preparation was, *A few members came unprepared. You can't come late and want to change things on the power point.*

Students also found group communication to be problematic: *No communication; I've had to make the presentation and after I've asked for something I only got it after 2 weeks.* Though the aforementioned issues were perceived as being contraindicative to good group work, students did realise that they are dependent on each other: *It will go better in future; We know each other better; We know realise how important this is; The situation is much better; More patient and punctual.* Students understood the problems and suggested ways to minimise them, indicating personal growth, openness to new experiences and roles, ability to take risks and accept challenges, responsibility for themselves and their own actions, and self-respect (Duckenfield & Swanson 1992:5). Students' awareness also shows social growth, growth in communication skills and leadership skills, the ability to work cooperatively with others and acceptance and awareness of diversity and multicultural backgrounds (Duckenfield & Swanson 1992:5).

5.7.19 Theme 19

Students also had to make suggestions in reference to the question, *What could you do differently next time to minimise such difficulties or further improve on the relationships with the community?*

5.7.19.1 Singular categories

Categories 19.1 - 19.5

One student suggested that difficulties with the community could be improved if the different parties in the relationship *Respect others* (2002). Another student was of the opinion that *Only science learners* (2021) were suppose to participate in the engagement, because they would understand. Linked to this comment another student believed that students should *Interact with Grade 12 learners during Visit 1* (2015), this would enable

students to *Assess level of knowledge* of the Grade 12 learners and thereby enable them to plan their Visit 2 interaction more effectively. The previously mentioned suggestions for minimising difficulties and achieving more effective interaction will only be achievable if there is *More time for presentation* (2040) and if a *More practical* (2032) approach is used. A more practical approach would improve learner understanding; the suggestion that more time also is needed tells us that students were responsive to community needs. This confirms what Srinivas and Wrench (2012:108) found in students' reflective portfolios, namely, that SL prepared students to be culturally and aesthetically sensitive.

5.7.19.2 *Category clusters <10 entrants*

The suggestions in Table 5.49 relate to attempts to improve the actual presentation. Students were of the opinion that the community experience would be more positive if students' preparation had been better in terms of time management and the presentation itself.

TABLE 5.49: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 19.6	<i>Make presentation interesting</i>	2001, 2005
Category 19.7	<i>Simplify information more</i>	1006, 1015, 2014, 2019, 2023, 2024
Category 19.8	<i>Improve presentation skills</i>	1008, 2003, 2005, 2007, 2008, 2010, 2012, 2042
Category 19.9	<i>More interaction</i>	2003, 2009, 2018, 2030, 2032, 2033, 2038
Category 19.10	<i>Punctuality</i>	2002, 2036
Category 19.11	<i>Scheduling</i>	2004, 2036

5.7.19.3 *Category clusters >10 entrants*

Category 19.12

Nothing, was the response of a big group of students. Students indicated that the intervention was good; the engagement did not need any improvement. Students were thus of the opinion that the purpose of the interaction had been realised.

Category 19.13

Another group of students sensed that the Grade 12 learners' feedback would point to the fact that *More confidence* should be displayed by students. This comment also fits the comments of better preparation made in Table 5.50.

5.7.19.4 Reflection discussion

From the interviews, two student groups said that they had *No problems* interacting with the community and consequently nothing needed to be done (*No*) to improve relationships. The interviews also confirmed that students had to display more confidence, as students stated, *Yes. I was nervous not used to present in front of people. I shake.* The statement, *The first time was the ice breaker next one will go better*, shows that students foresee personal growth.

Student feedback demonstrates a sense of caring for others and a sense of belonging (Duckenfield & Swanson 1992:5). It also indicates citizenship:

- A sense of responsibility to contribute to society;
- Democratic participation (informed citizen);
- Awareness of community needs;
- Social-action skills; and
- Empowerment, belief in own ability to make a difference (Duckenfield & Swanson 1992:6).

5.7.20 Theme 20

Theme 20 related to the question, *What assumptions did you bring to the situation?* Students had to indicate, *Which of the above proved to be true and which did not?*

TABLE 5.50: RESPONSES TO ASSUMPTIONS MADE AND THEIR VALIDITY
(table continues on next page...)

CATEGORY NO.	CATEGORIES	RUBRIC NO. PROVED TRUE	RUBRIC NO. DID NOT PROVE TO BE TRUE
Category 20.1	<i>None</i>	1004, 1005, 1020, 2001, 2008, 2017	
Category 20.2	<i>Grade 12 learners not interested</i>		2012, 2016, 2019, 2025, 2028, 2029, 2034, 2038, 2041

Category 20.3	<i>High Grade 12 numbers</i>		1011
Category 20.4	<i>Ignorant Grade 12 learners</i>	2004	
Category 20.5	<i>Group not prepared</i>	2010	2023
Category 20.6	<i>If I fail group will look down at me</i>		2018
Category 20.7	<i>Grade 12 learners did not comprehend</i>		2014
Category 20.9	<i>Good teamwork</i>	1002, 1003, 1013	1007
Category 20.10	<i>Difficult task</i>	2007	1006 1010
Category 20.11	<i>Scholars not attentive</i>	1018	1008, 1010, 1014, 1016
Category 20.12	<i>People are difficult (group)</i>	1009	
Category 20.13	<i>Grade 12 learners' level of understanding high</i>	1018	1012
Category 20.14	<i>Hard to work in a group</i>		2035
Category 20.15	<i>Bad teamwork</i>	1014, 1019, 2011, 2015, 2023, 2024, 2028	1001, 1003, 1021, 2002, 2003, 2015, 2024, 2031
Category 20.16	<i>Working in a group is time wasting</i>		2040
Category 20.17	<i>More questions from students</i>		2036, 2037
Category 20.18	<i>More students and teachers</i>		2036
Category 20.19	<i>Listening to other's opinions</i>	2002	

For the category *Bad teamwork* two students (2015 and 2024) provided mixed feedback. Rubric 2015: *group members needed to be pushed* proved to be true, but *all members will not carry their weight* did not prove to be true. Rubric 2024, *some do everything*, proved to be true, but *no cooperation*, in contrast, did not.

5.7.20.1 Reflection discussion

Similar sentiments came to the fore during the interviews. *I assumed the students wouldn't be interested in what we had to say; We thought it would be a bad experience; they wouldn't like us and what we had to say; I actually thought they were not going to be interested.* Another group agreed, *We thought they won't be interested or that they won't understand.* In relation to group interaction one student said, *I thought some group members will not perform well, but their performance was above average.* In relation to interaction with the community, one student said, *We presented info that the scholars were not familiar with. There were a lot of questions.*

Another student confessed that their assumptions were born from their personal frames of reference: *I think we were nervous because we didn't know what to expect. We thought*

they were going to laugh. We were scared of presentation skills. Other comments, such as, *I thought the kids would be naughty,* could have been avoided if there had been interaction during Visit 1.

From students' feedback it seems that assumptions that were raised during the interviews did not prove to be true: *In the end this did not prove true because some of the learners came to us and wanted to know more about the course and how long it will take to finish. They liked it; They actually were very much interested; The members actually exceeded my expectation.*

More tangible evidence of assumptions not proving to be true was presented by another group, which said, *None. They were interested and they understood what we were talking about. They asked questions and made comments. The kids were not that bad.*

Most of the assumptions can be associated with the success of the presentation, group dynamics and the interaction with the community. Most of the assumptions did not prove to be true, as can be seen in Table 5.50. Most of those that proved to be true were related to interpersonal issues. This exercise enabled students to have a clearer picture of society and to gear their responses accordingly, as alluded to by Martinez-Mier *et al.* (2011:7), who propose that students agree or strongly agree that SL assisted them to understand different cultures better.

5.7.21 Theme 21

Still taking students' frame of reference into account, students also had to answer the question, *Have past experiences influenced the way that you acted and the whether the influence was positive (1) or negative (2)?* For this theme, some students said that past experiences had *No effect* (1018, 1014, 1019, 2013 and 2031) on their actions or decisions.

5.7.21.1 Category 21.1

Past experiences and their influences mentioned by students are presented in Table 5.51. The experiences mentioned related to group interaction and previous presentations and were not related to the community. The student who completed 1018 said, *We have not done SL before.*

TABLE 5.51: PREVIOUS EXPERIENCES AND THEIR EFFECT

CATEGORY NO.	CATEGORIES	RUBRIC NO. POSITIVE	RUBRIC NO. NEGATIVE
Category 21.2	<i>Previous group assignments</i>	1001, 1003, 1009, 1017, 1020, 2001, 2009	2010, 2011, 2015
Category 21.3	<i>Class work</i>	2006, 2008	2007
Category 21.4	<i>Conflict management</i>	1005	
Category 21.5	<i>Previous presentations</i>	1002, 1004, 1006, 1008, 1011-1013, 1016, 1021, 2002, 2003, 2012, 2014, 2016, 2018	1005, 1015

In reference to *Previous presentations* rubric 2018 included the comment, *Previous self doubt at first, now I can do it.*

5.7.21.2 Reflection discussion

Only one group was of the opinion that previous experiences affected their interaction and decisions *Negatively*, but most said *Positive*. When students were asked to clarify their response of negative, students replied, *Not presented in public before. I've hated presentations from high school.* The positive feedback was clarified as follows: *I did a presentation in my first year and it gave me confidence to present again; They should bring it back to the second year it will help in your third year: The third years don't have that experience and confidence to stand there and to the presentation.*

Another group declared, *In the past when I had to do a speech I could look at papers but now it was more difficult and challenging.* Another group confirms the positive effect of previous experiences by responding that, *Previous work helped. The knowledge I had influenced the presenting positively.*

5.7.22 Theme 22

The next question in the rubric asked students, *What personal strengths of yours did the situation reveal?* Students also had to say, *In what way did they affect the situation positively?*

5.7.22.1 Category 22.1 – 22.11

Two students (rubrics 2010 and 2034) were of the opinion that no strengths had been revealed. Table 5.52 presents the strengths and each one's multiple positive effects.

TABLE 5.52: PERSONAL STRENGTHS AND THEIR POSITIVE EFFECTS PRESENTED AS SUBCATEGORIES
(table continues on next page...)

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY?		RUBRIC NO.
Category 22.2	Confidence	Subcategory 22.2.1	<i>Presented well</i>	1002,1004, 1006, 1014, 1016, 1020, 2004, 2013
		Subcategory 22.2.2	<i>Management</i>	1009
		Subcategory 22.2.3	<i>Face my fears</i>	1019
		Subcategory 22.2.4	<i>Boosted confidence</i>	2003, 2017
		Subcategory 22.2.5	<i>Positively</i>	2016
Category 22.3	Getting along with others	Subcategory 22.3.1	<i>Communication skills</i>	2002
		Subcategory 22.3.2	<i>Good interaction</i>	2002
		Subcategory 22.3.3	<i>Boosted confidence</i>	2003
		Subcategory 22.3.4	<i>Positively</i>	2008
Category 22.4	Competence	Subcategory 22.4.1	<i>Boosted confidence</i>	2022, 2031
		Subcategory 22.4.2	<i>Management</i>	2027
		Subcategory 22.4.3	<i>Improved confidence</i>	2036
		Subcategory 22.4.4	<i>Presented well</i>	2035
Category 22.5	Creativity	Subcategory 22.5.1	<i>Management</i>	1007
		Subcategory 22.5.2	<i>Creative presentation</i>	1008, 1011, 1017
		Subcategory 22.5.1	<i>Presented well</i>	1016, 1021
		Subcategory 22.5.4	<i>Positively</i>	2020
Category 22.6	Leadership	Subcategory 22.6.1	<i>Management</i>	1001, 2011
		Subcategory 22.6.2	<i>Positively</i>	2020
Category 22.7	Determination	Subcategory 22.7.1	<i>Management</i>	1001,2011, 2027
		Subcategory 22.7.2	<i>Boosted confidence</i>	2009
Category 22.8	Communication skills	Subcategory 22.8.1	<i>Management</i>	1003 and 2011
		Subcategory 22.8.2	<i>Presented well</i>	1005, 1010, 1012, 1014, 1018, 2005, 2012, 2014
		Subcategory 22.8.3	<i>Good interaction</i>	2002
		Subcategory 22.8.4	<i>Well prepared</i>	2038
Category 22.9	Public speaking	Subcategory 22.9.2	<i>Presented well</i>	2021
		Subcategory 22.9.1	<i>Boosted confidence</i>	2040
		Subcategory	<i>People trusted what I said</i>	2024

		22.9.2		
Category 22.10	Management skills	Subcategory 22.10.2	<i>Management</i>	2011
		Subcategory 22.10.1	<i>Helped others</i>	2037
Category 22.11	Team player	Subcategory 22.11.1	<i>Presented well</i>	1006, 1010
		Subcategory 22.11.2	<i>Management</i>	1007, 1009
		Subcategory 22.11.3	<i>No conflict</i>	2041

Students' feedback regarding their personal strengths revealed during the SL engagement is given in Table 5.52. The categories presented are explained further by specifying their effect by means of subcategories. The categories mentioned were factors that enhanced both the presentation itself and factors that ensured good interaction with others. The clarifying subcategories thus look very similar for the different categories; confidence featured strongly and most of the other feedback referred to the graduate attributes students need to display.

5.7.22.2 *Category 23.12 - 23.25*

The strength categories with singular positive effect subcategories are presented in Table 5.53. The categories presented in Table 5.52 had a higher frequency than those presented in Table 5.53.

TABLE 5.53: PERSONAL STRENGTHS AND THEIR POSITIVE EFFECTS

(table continues on next page...)

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY?	RUBRIC NO.
Category 22.12	Respect others' opinions	<i>Well prepared</i>	2038
Category 22.13	Respect differences	<i>Well prepared</i>	2038
Category 22.14	Courage	<i>Boosted confidence</i>	2007
Category 22.15	Responsibility	<i>Management</i>	2006
Category 22.16	Help others in group	<i>Management</i>	2015
Category 22.17	Good group interaction	<i>Management</i>	2023, 2024
Category 22.18	Tolerance of diversity	<i>Management</i>	2023
Category 22.19	Think on my feet	<i>Presented well</i>	2019
Category 22.20	Passion for teaching	<i>Presented well</i>	2029
Category 22.21	Commitment	<i>Boosted confidence</i>	2030

Category 22.22	Punctuality	<i>Management</i>	1001
Category 22.23	Initiative	<i>Management</i>	1007, 1015, 1021
Category 22.24	Presentation skills	<i>Presented well</i>	1012, 1018
Category 22.25	Composure	<i>Presented well</i>	1010, 1014

Other than *Passion for teaching* and *Presentation skills*, all the categories in Table 5.53 can be associated with *management* and *presented well*. These explanations can be the consequence of students' positive attitudes when working with others and the students recognising that the group is a vehicle for their own advancement, and the well-being of the community as the destination. Students' introspection and personal revelations in regard to this theme can be positive points of reference for handling similar situations in the future.

5.7.22.3 *Reflection discussion*

Feedback similar to that discussed in the previous sections was given during the interviews. Students had to discover their attributes, determine how the attributes are manifested and how they affected the situation. Confidence was again a large category, with students making the following claims: *I liked speaking in front of people; Confidence; Not being shy, and The fact that I can do public speaking, I was never good at it but I challenged myself, I can actually stand in front of people and do a presentation with a PowerPoint slide show.*

Another group member said *It gave me more confidence. After the presentation I had more confidence to stand in front of people to do a presentation.* Confidence was also the building blocks for *Presentation skills; self assessment in relation to presentation skills, if we were prepared; Ability to do research; Working with people, it was a success, there weren't many conflicts.* One student group reported personal growth by asserting, *We were challenged to do public speaking, we overcome it, that made us stronger.*

The evidence presented included a statement about the effect of students' strengths on SL, and when students were specifically asked about the effect of their strengths on the situation, they said, *Positive. The confidence helped us with the presentation; With the presentation everyone learned they had a voice, it was different than in class.* Other positive effects of students' strengths that were mentioned included, *Worked well in a group; It was a good presentation.* One student reported how he/she had grown and

become more responsive to the circumstances he/she found him/herself experiencing by saying, *My humorous side was revealed. It relaxed the situation.*

The positive effect of SL on the self-confidence of students was also a major theme in Kruger's study 'The majority of the students indicated that their self-confidence improved as a result of participating in SL' (Kruger 2013:155).

5.7.23 Theme 23

When interacting with diverse people and opinions, personal strengths can, in some situations, be detrimental to achieving the common goal. Students had to indicate *In what way did they (strengths) affect the situation negatively?*

5.7.23.1 Category 23.1 – 23.4

Table 5.54 shows the strengths and their multiple negative effects.

TABLE 5.54: PERSONAL STRENGTHS AND THEIR NEGATIVE EFFECTS PRESENTED AS SUBCATEGORIES

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION NEGATIVELY		RUBRIC NO.
Category 23.1	Confidence	Subcategory 23.1.1	<i>Stage fright</i>	2013
		Subcategory 23.1.2	<i>Communication skills</i>	1002, 2004
		Subcategory 23.1.3	<i>Nerves</i>	1009, 1016
		Subcategory 23.1.4	<i>Impatience</i>	1019, 1020
Category 23.2	Competence	Subcategory 23.2.1	<i>Stage fright</i>	2035
		Subcategory 23.2.2	<i>My opinion did not count</i>	2031
		Subcategory 23.2.3	<i>Babel</i>	2036
Category 23.3	Creativity	Subcategory 23.3.1	<i>Frustration</i>	1021
		Subcategory 23.3.2	<i>Bad time management</i>	1008
Category 23.4	Management skills	Subcategory 23.4.1	<i>Stage fright</i>	2037
		Subcategory 23.4.2	<i>Frustration</i>	2027
		Subcategory 23.4.3	<i>Some did not like me much</i>	2037

The subcategories clarify how students' perceived strengths could have unwanted results in different situations. The information can also assist students to be more selective regarding their approaches to dealing with others in future endeavours.

5.7.23.2 *Category 23.5 – 23.11*

Strengths and their singular negative effects are shown in Table 5.55. All the categories mentioned in Table 5.55 can be associated with interpersonal skills, which students saw as being strengths but the application of which could have been unjustified or flawed in the specific context.

TABLE 5.55: PERSONAL STRENGTHS AND THEIR NEGATIVE EFFECTS

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION NEGATIVELY	RUBRIC NO.
Category 23.5	Getting along with others	<i>Stage fright</i>	2002
Category 23.6	Tolerance of diversity	<i>People took advantage</i>	2023
Category 23.7	Leadership	<i>Impatience</i>	1001
Category 23.8	Determination	<i>Less group trust</i>	2009, 2011
Category 23.9	Composure	<i>Communication skills</i>	1010
Category 23.10	Communication skills	<i>Babel</i>	2014
Category 23.11	Public speaking	<i>At first self doubt than confidence</i>	2021

5.7.24 Theme 24

After the students identified their strengths and evaluated the effects thereof, students had to indicate *What could you do to build on strengths?* This question relates to both improving the positive effects of the strengths mentioned and to minimising or preventing the negative effects.

5.7.24.1 *Singular categories*

Category 24.1 - 6

Individual students believed that their strengths would be improved if they were *Attentive to others* (1007) and *Learn from others* (1017). These comments indicate students'

willingness to be more responsive to others and thereby learn and grow from the experience.

In relation to the presentation, *Better pronunciation* (1002) and *Stay calm* (2037) were suggested by two students. *Better time management* of the SL activity as a whole was recommended by the student who completed rubric 1008. Students' identification and evaluation of their strengths was a self-evaluation activity that added an alternative perception and thereby provided more holistic feedback; another student proposed *Peer assessment* (1001).

5.7.24.2 Category clusters <10 entrants

The categories of the replies in Table 5.56 relate to group interaction assisting in improving students' strengths. Linked to the previously mentioned peer assessment (cf. Section 5.7.24.1), there were students who believed that they were obliged to assist other students to develop their strengths. Students were thus open and responsive to the needs of their fellow students.

TABLE 5.56: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 24.7	<i>Open to others' suggestions</i>	2001, 2006
Category 24.8	<i>Do my part</i>	2024, 2027
Category 24.9	<i>I should be more expressive</i>	2032, 2033
Category 24.10	<i>Help others to improve their strengths</i>	1003, 1015
Category 24.11	<i>Better interaction with group</i>	2009, 2011, 2025, 2029, 2042

5.7.24.3 Category clusters >10 entrants

Category 24.12

Most of the abovementioned steps that promote the improvement of strengths fall, to some degree, under the categories with the highest frequency, namely, *More self belief*, *More preparation* and *More practise*. These categories reflect an element of personal growth and social responsiveness, where society includes both the SL community and fellow students.

5.7.24.4 Reflection discussion

Similar answers, such as, *More practise, Presentation skills, Self belief, More rehearsals, More interaction* and *Practise, practise makes perfect*, were given by students during the interviews. These responses relate to improving both the presentation and students' confidence.

Further suggestions for improving strengths revolved around group interaction; these were *teamwork, different scheduling, maintain patience; be more understanding and tolerant of circumstances*.

If students were to follow their own advice, they could achieve the benefits of SL that Duckenfield and Swanson (1992) suggest:

- Personal growth through improved confidence and esteem;
- Social growth through communication skills and the ability to work cooperatively with others;
- Intellectual growth through the application of knowledge, problem-solving and decision-making skills;
- Citizenship through a sense of responsibility to contribute to society; and
- Preparation for the world of work through providing human, service and reliable working skills (Duckenfield & Swanson 1992:6).

5.7.25 Theme 25

Students also had to answer the question, *What personal weaknesses of yours did the situation reveal?* and were asked to reveal *In what way did they affect the situation positively?* The students' feedback is shown in Table 5.57. Two students (rubrics 2002 and 2010) were of the opinion that no weaknesses had been revealed.

5.7.25.1 Category 25.1 – 25.9

Table 5.57 presents the weaknesses and each one's multiple positive effects

TABLE 5.57: PERSONAL WEAKNESSES AND THEIR POSITIVE EFFECTS PRESENTED AS SUBCATEGORIES
(table continues on next page...)

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY		RUBRIC NO.
Category 25.1	Control freak	Subcategory 25.1.1	<i>Impatience motivated others</i>	2011
		Subcategory 25.1.2	<i>Self awareness</i>	2041
Category 25.2	Nerves	Subcategory 25.2.1	<i>Did not influence</i>	1006, 1007, 1020, 2004
		Subcategory 25.2.2	<i>Positively</i>	2008
		Subcategory 25.2.3	<i>Increased self-awareness</i>	1012
Category 25.3	Impatience	Subcategory 25.3.1	<i>Impatience motivated others</i>	1001, 1005, 2009, 2027
		Subcategory 25.3.2	<i>Did not</i>	1019, 1021
		Subcategory 25.3.3	<i>Positively</i>	2026
		Subcategory 25.3.4	<i>Increased self-awareness</i>	1011
		Subcategory 25.3.5	<i>Inputs timely</i>	2014
Category 25.4	Pushy	Subcategory 25.4.1	<i>Things happened</i>	1008
		Subcategory 25.4.2	<i>Did not influence</i>	1007
Category 25.5	Communication skills	Subcategory 25.5.1	<i>Increased self-awareness</i>	1018
		Subcategory 25.5.2	<i>Did not influence</i>	1002, 1004, 1010, 2020, 2021
Category 25.6	Decreased confidence	Subcategory 25.6.1	<i>Did not influence</i>	2012, 2013, 2016, 2017, 2025, 2042
		Subcategory 25.6.2	<i>More confident</i>	2029
		Subcategory 25.6.3	<i>Public speaking we supported each other</i>	2030
Category 25.7	Anxiety	Subcategory 25.7.1	<i>Did not influence</i>	2037
		Subcategory 25.7.2	<i>Wanted to finish presentation</i>	2035
Category 25.8	Public speaking	Subcategory 25.8.1	<i>Overcome fear</i>	2001, 2003, 2006, 2007
		Subcategory 25.8.2	<i>Listened, good interaction</i>	2005
		Subcategory 25.8.3	<i>Did not influence</i>	2012, 2018, 2019, 2020, 2028, 2032, 2034
		Subcategory 25.8.4	<i>More confident</i>	2029
		Subcategory 25.8.5	<i>Public speaking we supported each other</i>	2030
		Subcategory 25.8.6	<i>Positively</i>	2008
Category 25.9	Procrastination	Subcategory 25.9.1	<i>Did not influence</i>	1016, 1017, 2039

		Subcategory 25.9.2	<i>Inputs timely</i>	2015
		Subcategory 25.9.3	<i>Worked well under pressure</i>	2024

Through introspection students identified and were able to interpret the positive influences of their perceived shortcomings on the success of the intervention. Weaknesses confessed can be associated with social cohesion and having high-quality interaction with the community. The subcategories in Table 5.57 illustrate that students were able to apply self-control though introspection.

5.7.25.2 *Category 25.10 – 25.15*

The perceived shortcomings with singular positive effect are presented in Table 5.58.

TABLE 5.58: PERSONAL WEAKNESSES AND THEIR POSITIVE EFFECTS

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY?	RUBRIC NO.
Category 25.10	Trust issues	<i>Impatience motivated others</i>	2011
Category 25.11	Cannot work under pressure	<i>Did not influence</i>	2023
Category 25.12	Attentiveness	<i>Improved listening</i>	1009
Category 25.13	Perfectionist	<i>Perfectionism motivated others</i>	1014
Category 25.14	Lack of perseverance	<i>Motivation from others</i>	1003
Category 25.15	Selectivity with info, too much	<i>Detailed info presented</i>	2036

With the exception of the last category in Table 5.58, all the categories relate to personality issues. The group approach to SL demands that students should compromise in some situations and take the lead in others. The socialised student should be able to recognise when which of the aforementioned approaches are applicable, thus providing evidence of personal growth and social responsiveness.

5.7.25.3 *Reflection discussion*

Students revealed similar weaknesses in the interviews and the reflection rubric. One of the weaknesses that had a negative effect is confidence: *Nervousness. Can't do public speaking, am very shy; I don't like speaking with the microphone, and Stage fright, nervousness; I struggle to express what I want to say, it was there but couldn't get it out.* Other weaknesses are time management and organisational issues: *Doing things last minute and, The lack of organisation, time management; Better preparation.*

The positive effect of these weaknesses can be attributed to compromise, *We had to compensate, adjust*. One group member mentioned that causality revealed a personal weakness, *Someone irritated me*, but that was also the trigger for better understanding and a more successful intervention, *After the quarrel there were better reactions. It motivated the others*.

5.7.26 Theme 26

A follow-up question that students had to answer for Theme 24 was, *In what way did personal weaknesses affect the situation negatively?* In this instance four students said that their weaknesses did not affect the situation, and evidence can be found in rubrics 2002, 2005, 2006 and 2040.

5.7.26.1 Category 26.1 – 26.8

The students' personal weaknesses and each one's multiple negative effects are presented Table 5.59. In relation to this first presentation, students could expect some nerves and anxiety and from the number of rubrics presented, it is clear that weaknesses had minimal negative effects and were a consequence of students being out of their comfort zone.

TABLE 5.59: PERSONAL WEAKNESSES AND THEIR NEGATIVE EFFECTS AS SUBCATEGORIES (table continues on next page...)

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION NEGATIVELY?		RUBRIC NO.
Category 26.1	Nerves	Subcategory 26.1.1	<i>Decreased confidence</i>	1006
		Subcategory 26.1.2	<i>Info not delivered</i>	1012
		Subcategory 26.1.3	<i>Group conflict</i>	1007
Category 26.2	Impatience	Subcategory 26.2.1	<i>Negatively</i>	2012
		Subcategory 26.2.2	<i>Group morale</i>	2009
		Subcategory 26.2.3	<i>Impatient with group</i>	2014, 2027
		Subcategory 26.2.4	<i>Decreased confidence</i>	1021
		Subcategory 26.2.5	<i>Group conflict</i>	1019
Category 26.3	Communication skills	Subcategory 26.3.1	<i>Message not received</i>	2021
		Subcategory 26.3.2	<i>Info not delivered</i>	1010, 1018
Category 26.4	Decreased confidence	Subcategory 26.4.1	<i>Negatively</i>	1017, 2012
		Subcategory 26.4.2	<i>Fumbled when started</i>	2029

		Subcategory 26.4.3	<i>Decreased confidence</i>	1015, 2013, 2017
		Subcategory 26.4.4	<i>Presentation skills</i>	2042
Category 26.5	Anxiety	Subcategory 26.5.1	<i>Negatively</i>	2035
		Subcategory 26.5.2	<i>Stuttered</i>	2037
Category 26.6	Public speaking	Subcategory 26.6.1	<i>Negatively</i>	2018, 2020, 2028, 2034
		Subcategory 26.6.2	<i>Presented too long</i>	2019
		Subcategory 26.6.3	<i>Decreased confidence</i>	2020
		Subcategory 26.6.4	<i>Presentation skills</i>	2001, 2007
Category 26.7	Procrastination	Subcategory 26.7.1	<i>Fumbled when started</i>	2015
		Subcategory 26.7.2	<i>Delayed submission</i>	2039
		Subcategory 26.7.3	<i>Others impatient with me</i>	2024
		Subcategory 26.7.4	<i>Decreased confidence</i>	1016
Category 26.8	Presentation skills	Subcategory 26.8.1	<i>Message not received</i>	2031
		Subcategory 26.8.2	<i>Presentation skills</i>	2033

As in Section 5.7.25, the weaknesses mentioned can be associated with social cohesion and involved high-quality community interaction. From a personal context, decreased confidence affected the group interaction and presentation negatively. Ineffective group interaction affected the preparation and consequently the community interaction. Insufficient preparation and unfamiliarity with the environment also played a negative role during the presentation itself.

5.7.26.2 Categories 26.9 – 26.13

The students' personal weaknesses and their singular negative effects are presented Table 5.60. The categories in Table 5.60 all represented singular feedback; the consequence of individual members of a group possessing these weaknesses was group conflict. Students discovered that they have difficulty in being selective with the information required to achieve the specific learning outcomes.

TABLE 5.60: PERSONAL WEAKNESSES AND THEIR NEGATIVE EFFECTS

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION NEGATIVELY?	RUBRIC NO.
Category 26.9	Control freak	<i>Impatient with group</i>	2011
Category 26.10	Attentiveness	<i>Decreased confidence</i>	1009
Category 26.11	Perfectionist	<i>Group conflict</i>	1014
Category 26.12	Lack of perseverance	<i>Group morale</i>	1003
Category 26.13	Selectivity with info, too much	<i>Scholars lose concentration when too long</i>	2036

5.7.26.3 Reflection discussion

During the interviews one group said that lack of confidence affected the interaction negatively, they made the following comment: *Negatively. I was nervous, forgot my words, extend the time and blah, blah, blah do not mean anything. Being clueless is not very informative.* The same group added, *When you present, it does not make sense to you but is not always the way people see it.* Another group said that their impatience with group members had lead to group conflict, *Because I got angry.* One of the five groups interviewed strongly believed that their weaknesses lead to a *Bad experience.*

5.7.27 Theme 27

The purpose of reflection is to assist students to think critically, because by coming up with solutions to problems they achieve personal growth. The next question students were asked was, *What could you do to overcome weaknesses?*

5.7.27.1 Singular categories

Categories 27.1 – 27.7

One student (rubric 2041) stated that he/she should be less assertive and should validate others' opinions: *More group less me.* In contrast, another student felt that he/she should apply more *Attentiveness* (1009) during group interaction. These comments, and *Trust group members* (2011), clearly reflect personal realisations, whereas suggestions of *Group communication* (2009) and *More preparation* (2032) could be ways to minimise weaknesses that have a negative effect on group interaction. Some suggestions could improve group interaction, such as *Create own groups* (2027), but this would deny

students opportunities to make discoveries that being a member of diverse group of strangers could provide.

Focus on strengths (1002), one student's suggestion for overcoming weaknesses, implies enhancing strengths so they outweigh weaknesses. This strategy could have a negative effect in that weaknesses are not addressed but rather swept under the proverbial carpet.

5.7.27.2 Category clusters <10 entrants

The various group suggestions for addressing weaknesses, as presented in Table 5.61, are a result of students' personal growth (Categories 27.8-27.11) and assessment of the organisational practices of the group (Category 27.12). The consequences of these suggestions would be better group dynamics and improved SL presentation and intervention.

TABLE 5.61: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 27.8	<i>Improve self belief</i>	2017, 2020, 2031
Category 27.9	<i>Improve confidence</i>	2008, 2010, 2013, 2018, 2020, 2029, 2030
Category 27.10	<i>Practice patience</i>	1001, 1007, 1008, 1011, 1014, 2014
Category 27.11	<i>Positive thinking</i>	1006, 1017, 1020
Category 27.12	<i>Time management</i>	1016, 2024

5.7.27.3 Category clusters >10 entrants

Category 27.13

The category for which the rubrics provided the most feedback was *Practise*. In this instance practise can refer to more dress rehearsal, including presentation, presentation skills and communication skills. Practise can also include practising better interaction with group members, which is a more general suggestion than the specific feedback given earlier.

5.7.27.4 Reflection discussion

Interpersonal and organisational issues that were identified during the interviews referred to areas that needed to be addressed. Groups interviewed referred to *Practice, Preparation, More confidence, better time management, Be more optimistic, Prepare earlier*. A different group mentioned ways to minimise perceived difficulties associated with presentation skills, *Take a deep breath, relax, and take your time, Better preparation*. Another group addressed group dynamics with the statement, *Practice more and have patience, Listen more, Better communication*. Students have not had the opportunity to engage with the community, in the community, and believed that the intervention would improve if students *Get more exposure*.

Suggestions of ways to overcome weaknesses given by students would allow them to achieve Duckenfield and Swanson's proposed benefits of personal growth, social growth, intellectual growth, citizenship and preparation for the world of work (Duckenfield & Swanson 1992:6).

Through the CBE and/or SL activities students got the opportunity to identify their own personal strengths and weaknesses, were able to improve or address them and experienced a sense of self-fulfilment (Kruger 2013:155).

5.7.28 Theme 28

Table 5.62 contains three different information sets, *personal values, beliefs and convictions*, in reference to the question, *How did this situation reinforce your...?* The reason for unpacking the data in this manner was that students were unsure in their evaluation of these three elements. Consequently there were similarities in responses.

TABLE 5.62: RESPONSES TO REINFORCEMENT OF VALUES, BELIEFS AND CONVICTIONS (table continues on next pages...)

28.1.1 PERSONAL VALUES			28.1.2 BELIEFS			28.1.3 CONVICTIONS		
Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.
28.1.1.1	<i>Scholars respected me</i>	2036	28.1.2.1	<i>Bringing knowledge to community is</i>	2035, 2036	28.1.3.1	<i>My wishes for good as applied to my</i>	2036

				<i>vital</i>			<i>siblings</i>	
28.1.1.2	<i>Increased self-confidence</i>	2007, 2010, 2013, 2018, 2021, 2034	28.1.2.2	<i>Group work is stupid</i>	2011	28.1.3.2	<i>Community open/friendly</i>	1010, 1012, 1014
28.1.1.3	<i>I feel better respected</i>	2018, 2038	28.1.2.3	<i>Perspective of other communities</i>	2020, 2031	28.1.3.3	<i>Determination</i>	2014
28.1.1.4	<i>Self believe</i>	2008, 2017, 2024, 2029, 2032	28.1.2.4	<i>Group work good</i>	2024	28.1.3.4	<i>Provide best possible info</i>	1001
28.1.1.5	<i>Perspective of other communities</i>	2020	28.1.2.5	<i>Treat others with respect</i>	1001, 1008, 1010, 1011, 1015, 2014	28.1.3.5	<i>Positively</i>	1018, 2005, 2016, 2029
28.1.1.6	<i>Interact with others</i>	1014	28.1.2.6	<i>More to Radiography also social responsibility</i>	1012	28.1.3.6	<i>Self-confidence improved</i>	1002, 1015
28.1.1.7	<i>Did not</i>	1010, 2009, 2011, 2012, 2023, 2031, 2033	28.1.2.7	<i>Positively</i>	1018, 2016	28.1.3.7	<i>Service and education important</i>	2035
28.1.1.8	<i>Teamwork</i>	1011, 1017, 1021	28.1.2.8	<i>Confidence to address others</i>	1002, 1006, 1014, 2007	28.1.3.8	<i>Changing the community</i>	2038
28.1.1.9	<i>Through helping others</i>	1001, 1009, 1015, 1016, 1020, 2002, 2014, 2015	28.1.2.9	<i>Gr 12 not stupid as I thought</i>	2037	28.1.3.9	<i>Respect others, regardless of age</i>	2039
28.1.1.10	<i>Not to judge the situation beforehand</i>	2019	28.1.2.10	<i>Gained more confidence</i>	2038	28.1.3.10	<i>Tolerate other group members</i>	2027
28.1.1.11	<i>Bad teamwork</i>	2027	28.1.2.11	<i>Not taking things personally</i>	2039			
28.1.1.12	<i>Perseverance</i>	2030	28.1.2.12	<i>Patience with others</i>	2027			

28.1.1.13	<i>Confidence to address others</i>	1012, 1013	28.1.2.13	<i>Don't need others, group</i>	2040
28.1.1.14	<i>Positively</i>	1018, 2005, 2016	28.1.2.14	<i>Together we can do more</i>	2015, 2040
28.1.1.15	<i>Open to new experiences</i>	1006	28.1.2.15	<i>Self doubt</i>	2034
28.1.1.16	<i>Respect others</i>	1003, 1008, 1009	28.1.2.16	<i>Respect others' opinions</i>	1003
28.1.1.17	<i>Humble myself in front of others</i>	2035	28.1.2.17	<i>Through helping others</i>	1020, 1021
28.1.1.18	<i>Put my need second</i>	2037, 2041			
28.1.1.19	<i>All group members responsible for success</i>	2001			

Eyler and Giles (1999:24) list five possible cognitive and affective factors that determine the success of SL, namely, personal views, interpersonal development, perspective transformation, citizenship skills and values. The results presented in Table 5.62 also display how the first four influence the last factor, namely values.

The students' personal values that were reportedly reinforced reflect both personal and social affirmation. Personal affirmation involved improved confidence, improved self-belief and improved self-respect; whereas social affirmation was a result of being open to the community and doing something for the community. It correlates with what Duckenfield and Swanson (1992:6) refer to as citizenship—awareness of community needs. The mentioned sources of enhancement of personal values can be seen as the first step to social responsiveness, which was also demanded by the societal value of respecting others and respecting others' opinions.

Students also provided feedback about personal beliefs relating to both personal and social affirmation. Personal affirmation comprised improved confidence, more patience and less self-doubt. Personal beliefs were reinforced through interacting with other communities and treating others with respect, which was a consequence of social affirmation. For this theme, group work received mixed reviews; one student said that group work was stupid, another said it was good, one said that he/she does not need the group and two other students said that *together we can do more*.

Reinforced convictions due to personal affirmation were a result of improved self-confidence and determination. Reinforced convictions due to social affirmation was a product of respect, doing good to others and because the community was susceptible to and appreciative of students' efforts. The student who completed rubric 2035 declared that *Service and education are important*. Another student (rubric 2036) stated that his/her convictions were reinforced because the community was like family: *My wishes for good as applied to my siblings*.

Personal values, beliefs and convictions were thus enhanced, indicating that personal growth had taken place, and elements of social responsiveness were present.

5.7.28.1 Category clusters >10 entrants

Categories 28.2 - 28.3

Many students indicated that the SL intervention *Did not reinforce my beliefs* and also *Did not reinforce my convictions*. One can speculate about the reasons for this response, one can be the fact that feedback on *personal values* does not feature in this context; other reasons are the generally limited feedback for the three questions and the uneven spread of results: values had the most feedback, followed by beliefs and then convictions with the least. Taking all of the previously presented arguments as well as the similarities in the feedback about the three themes into consideration, it can be postulated that students were not able to distinguish between values, beliefs and convictions.

5.7.28.2 Reflection discussion

During the interviews the different groups gave mixed replies to the question *How did this situation reinforce your personal values, beliefs and convictions: It didn't touch us that deeply; It felt good to be able to inform other people; Not life changing*.

An individual student from a different group commented, *It did not*, during the group interviews, but the group feedback was, *We felt that we brought something to the community; Giving others a chance to improve themselves in the group; I actually allowed myself to be lead but others; I accommodate other persons' points of view; Understanding that sometimes I won't be understood, when working with others you have to. I got the opportunity to be more assertive.*

Like in the rubrics, students' sense of reinforcement had elements of personal affirmation as well as social affirmation. This was not only the case in one group interview; another group expressed the same sentiments: *Self belief; Believe in yourself and feel happy because you could do the challenges.*

One group believed that they did not experience a sense of personal reinforcement because they did not include issues currently relevant to the Grade 12 learners; their comments included, *We felt they enjoyed it just for the day; I felt unless they are interested in Radiography the information was not relevant; For example the boys are not interested in the mammograms; We should inform them about Radiography as a career. They are focused on what they want to do next year.*

5.7.29 Theme 29

Also in relation to personal growth, students had to respond to the question, *How did this situation challenge values, beliefs and convictions?* Table 5.63 contain three different information sets: personal values, beliefs and convictions.

TABLE 5.63: STUDENTS' FEEDBACK OF CHALLENGES ASSOCIATED WITH PERSONAL VALUES, BELIEFS AND CONVICTIONS
(table continues on next page...)

29.1.1 PERSONAL VALUES			29.1.2 BELIEFS			29.1.3 CONVICTIONS		
Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.
29.1.1.1	<i>Doing the presentation</i>	1006, 1017, 1020	29.1.2.1	<i>Importance of delivering info</i>	2036	29.1.3.1	<i>Did not</i>	1001, 1013, 1016, 1017, 2002, 2008,

								2009, 2021, 2035, 2039
29.1.1.2	<i>Prepare to be the best</i>	1012	29.1.2.2	<i>More group less me</i>	1007, 1011	29.1.3.2	<i>Confidence to address others</i>	1002
29.1.1.3	<i>Giving back</i>	2014, 2016	29.1.2.3	<i>Self-belief</i>	1021	29.1.3.3	<i>Going along with something, I disagreed with</i>	2024
29.1.1.4	<i>Expected more from members</i>	2027	29.1.2.4	<i>Positively</i>	1018, 2005	29.1.3.4	<i>Believe in others</i>	1008, 1010, 1014, 1015
29.1.1.5	<i>Out of comfort zone</i>	2015, 2020	29.1.2.5	<i>I needed to change</i>	2037	29.1.3.5	<i>Positively</i>	1018, 2005
29.1.1.6	<i>Being told what to do</i>	2024	29.1.2.6	<i>Determination</i>	2014	29.1.3.6	<i>Learners are more advanced than I thought</i>	2036
29.1.1.7	<i>Value of my studies</i>	2021	29.1.2.7	<i>Out of comfort zone</i>	2020			
29.1.1.8	<i>More group less me</i>	1003, 1007, 1011, 1014, 1015, 2001, 2008	29.1.2.8	<i>Prioritise studies</i>	2021			
29.1.1.9	<i>Self believe</i>	1021	29.1.2.9	<i>Trust others</i>	2024			
29.1.1.10	<i>Positively</i>	1018, 2005	29.1.2.10	<i>Expected more from members</i>	2027			
29.1.1.11	<i>Mutual respect</i>	1008, 1009	29.1.2.11	<i>Positive feedback</i>	1020			
29.1.1.12	<i>Confidence to address others</i>	1002, 2013, 2029	29.1.2.12	<i>Confidence to address others</i>	1002, 1006, 1008, 1010, 1012, 1014, 2007			
29.1.1.13	<i>Introspection improved</i>	2010, 2030	29.1.2.13	<i>Patience pays</i>	2041			
29.1.1.14	<i>Public speaking not for all</i>	2034	29.1.2.14	<i>People have dodgy priorities</i>	2030			
29.1.1.15	<i>Confidence</i>	2020	29.1.2.15	<i>Confidence</i>	2020			
			29.1.2.16	<i>Happy with what I did</i>	2016			

Kiely (2005:8) mentions that perspective transformation is triggered by a disorienting

dilemma. Where previously-taken-for-granted assumptions, values, beliefs, and lifestyle habits are assessed and, in some cases, radically transformed.

The perceived personal values that were challenged (as mentioned by students) were influenced by personal critique in a societal differentiation and demand paradigm. Personal critique was revealed by students mentioning confidence and self-belief; in the words of two students, *Introspection improved*. Societal differentiation of values happened when students felt that they were out of their comfort zones and when students had to put the group first. In reference to the confidence to address others, the student who completed rubric 1012 added, *shows professional integrity and knowledge*. Societal demands required students to show mutual respect, even when they were being told what to do. This mutual respect represents the positive change in attitude towards the community reported by Prinsloo *et al.* (2006:97). Personal beliefs were challenged due to personal critique elements such as self-belief and trusting others. Societal differentiation that challenged students' beliefs were students feeling that they were out of their comfort zones and students feeling that some group members had *dodgy priorities*. Challenges stemming from both personal critique and societal demand are encapsulated by students mentioning the importance of delivering the message.

Convictions were challenged by the personal critique of confidence and belief in others. Community differentiation depicted the challenges associated with going along with something that you did not personally agree with. Community demand challenged students' convictions through students discovering that *Learners are more advanced than I thought*, thus indicating the positive change in students' perception of the community (Prinsloo *et al.* 2006:97).

Identifying personal values, beliefs and conviction challenges required students to exhibit self-awareness and introspection, a product of which could be personal growth and, in some instances, social responsiveness.

5.7.29.1 Category clusters >10 entrants

Categories 29.2 – 29.3

Many students indicated that the SL intervention *Did not challenge my personal values* and *Did not challenge my beliefs*. As discussed in Section 5.7.28, the spread of the information and the generally limited feedback for the three questions can be an

indication that students were not able to distinguish between *personal values, beliefs and convictions*.

5.7.29.2 Reflection discussion

One student group's personal values, beliefs and convictions were challenged by being exposed to communities different from themselves: *It gave me another insight; I've never been to those parts of Bloemfontein; I didn't expect the community around the school it to be what it was; It gave me another perspective of how these children go to school; Understood the community.*

Due to personal critique and societal demands students were also able to say, *We often take things personally; if I did I would have been miserable; The team is on the line, if anything bad happens, they will point at us.* Other comments relating to personal critique were, *My way was the right way; I had to give others a chance and was challenged to give others a chance; I was more a group member than an individual; Compromise: let it go if not agree.* One student from another group commented, *I was challenged in the sense that I don't like making jokes. I am an introvert. It challenged my serious introvert side;* this comment was due to societal differentiation, societal demand and personal critique.

Not only does SL shape the values, beliefs and convictions of students, it changes their values, beliefs and convictions (Julie *et al.* 2005:51). In doing so, SL enables active participation in activities related to democratic citizenship, thereby working towards solving problems where the ability to solve problems become part of students' professional activities.

5.7.30 Theme 30

The final question for the personal growth and social responsiveness section of the rubric asked, *Should I have worked with others in a different way?*

5.7.30.1 Singular categories

Singular categories for this theme are presented in Table 5.64.

TABLE 5.64: SINGULAR CATEGORIES FOR THEME 30

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 30.1	<i>Group communication</i>	2030
Category 30.2	<i>Motivate others</i>	2027
Category 30.3	<i>More interaction with learners</i>	2021
Category 30.4	<i>More information</i>	2003
Category 30.5	<i>Time management</i>	2015

The feedback provided in Table 5.64 contains elements of interaction with others as well as factors necessary for a successful presentation and interaction. The feedback demonstrates both personal growth and social responsiveness.

5.7.30.2 Category clusters <10 entrants

Categories 30.6 - 307

Four students mentioned striving to have *More interaction with group*. These were the students who completed rubrics 2008, 2010, 2029 and 2041. Six students commented *Yes* (1010, 1019, 2011, 2012, 2029 and 2036) and the student who completed rubric 1010 specifically referred to *Working differently with the group*.

5.7.30.3 Category clusters >10 entrants

Category 30.8

There were also students who said *No*, implying that they did not believe they had to work differently with others in future.

5.7.30.4 Reflection discussion

As above, there were also student groups that, during the interviews, reported, *We worked well together; It was a good group; Actually I've had no problems with the learners or group; It was fine; More interaction*.

Two groups said that they would work differently, one in reference to *Time management*, the other spoke of the presentation as well as troubleshooting: *Yes. While we are presenting we should learn to look at the people and their reactions; Make it also more interesting; As a group we solved our problems*.

Using SL to advance the “pluriversity” approach, where extrinsic factors influences institutional policy, additionally creates personal growth and social responsibility in students, by them being exposed to communities other than themselves. The findings also illustrates that ignorance of other shape our perceptions and manifest in unfounded assumptions.

The questions of Theme 31 to Theme 34 ask students to examine and analyse the SL experiences from the *Management Point of View*.

5.7.31 Themes 31 - 33

As Heffernan (2001.:4) indicates, it is important to use an appropriate model of SL; in this instance *discipline-based SL* is service to the community related to course content, with students reflecting on the experience through analysis and improved understanding. This model can be problematic because it limits the variety of interactions. It is thus important to obtain students’ views on whether they believe that they have received *appropriate orientation regarding the purpose* (Theme 31) *and process* (Theme 32) *of SL*. Table 5.65 presents these results. The table presents student replies to the question, *Was the action appropriate to the situation?*

TABLE 5.65: STUDENT RESPONSES FOR THEMES 31-33

THEME 31		THEME 32		THEME 33	
<i>Were you given appropriate orientation regarding the purpose of SL?</i>		<i>Were you given appropriate orientation of the SL process?</i>		<i>Was the action appropriate to the situation?</i>	
Yes	No	Yes	No	Yes	No
1001-1021, 2001-2017, 2020-2024, 2026-2029, 2031-2042	2025, 2030	1001-1021, 2001-2017, 2020-2024, 2026-2042	2025	1001-1021, 2001-2010, 2012-2017, 2020-2024, 2026, 2028, 2029, 2031-2042	2011

Most students indicated that they had received appropriate orientation regarding the purpose and process of SL (cf. Table 5.67). The same feedback was given when students were asked whether the action was appropriate for the situation. Rubric 2011’s student also mentioned, *less rush, more specific* action/interaction would have been more appropriate to the situation. The evidence presented in Table 5.65 informs us that the students understood why and how they had to interact with the Grade 12 learners. The

results also tell us that students felt that their responses to the identified community need were appropriate.

5.7.31.1 *Reflection discussion*

The student interviews delivered the same feedback as the rubrics, with four of the five groups agreeing that they had received appropriate orientation regarding the purpose and process of SL. Most replied *Yes*; only one group said *No*.

Though general group feedback suggests that most groups were of the opinion that the orientation was satisfactory, there were individual comments such as, *I did not understand well; Maybe next year we should spend more time on why we do what we do; It is also in relation to prevention*. The reader should keep in mind that the entire class—that is all groups together as a whole—was orientated at the same time regarding the purpose, process and rollout of CUT Radiography SL.

Other individual comments were, *Maybe we should break up into smaller groups; We didn't know we could do anything we wanted: We thought we had to do it in a specific way: We must do a dress rehearsal first*. Students were not given any prescriptions for how they were to engage with the community. During SL orientation students were informed by the facilitator that they could address the outcomes in any way they chose. Clearly more guidance from the facilitator was needed in this regard.

5.7.32 Theme 34

Students were asked, *Do you think the SL intervention addressed community needs as intended?*

TABLE 5.66: STUDENT RESPONSES FOR THEME 34

CATEGORY 34.1 <i>YES</i>	CATEGORY 34.1 <i>NO</i>	CATEGORY 34.1 <i>PARTIALLY</i>
1001-1012, 1014-1021, 2002, 2005-2017, 2020-2023, 2028, 2031-2033, 2035, 2036, 2038-2040, 2042	2025	1013, 2001, 2003, 2004, 2024, 2026, 2027, 2029, 2030, 2037, 2041

From Table 5.66 it is clear that most students were of the opinion that the community needs were addressed as intended. One student disagreed, and 11 students stated that we partially addressed community needs as intended.

5.7.32.1 Reflection discussion

During the Visit 2 interviews three of the five groups said, *Yes*, we did address the communities' needs .One of the five groups disagreed, saying *No*, and the last group said *Yes, partially*.

5.7.33 Theme 35

Students were then asked to *Clarify your answer in the above question*.

5.7.33.1 Categories for YES

The sections discussed below provide the students' clarification of their affirmative feedback, stating whether they believed that the SL interaction addressed community needs as intended.

Categories 35.1 – 35.7

Most students clarified their statement of *Yes* by saying that they felt that the session had been *Informative* (1002, 1003, 1006, 1008-1010, 1012, 1014-1016, 1018-1021, 2006, 2009, 2011, 2013, 2015-2017). One student added that, *the intended message was received* (rubric 2017). Other students stated that community needs had been addressed as intended because *The community appreciate* (2008, 2012, 2020, 2028 and 2032). This not only confirmed the applicability of the engagement in addressing community needs, but also validated the students' efforts. Two students said that *Scholars relate to topic* (2010 and 2011), implying that the presentation information was relevant, where relevant in this instance relates to the Grade 12 natural science syllabus. Five students were of the opinion that the engagement with the Grade 12 learners went beyond that of spreading information; they believed it was *Educational* (2007, 2012, 2014, 2023 and 2042).

In some instances students reported that community needs had been addressed because the information community members received would lead to improved community health

through *Prevention and diagnosis* (1011, 1016, 1018, 1019, 2001, 2002, 2005, 2006, 2008, 2014 and 2020). The students who completed rubrics 2005 and 2006 believed that *learners will spread the information*. The Grade 12 learners were the community with whom students interacted directly, but the purpose of the interaction was to improve community health. Grade 12 learners were informed during the presentation that they were supposed to inform others and thereby diffuse the information further. Comments by students indicate that students believed that they had fulfilled the intended purpose of the engagement and that further dissemination of the information received would indeed happen.

5.7.33.2 Reflection discussion

During the interviews most student groups agreed that they did indeed address community needs as intended. The following statements confirmed this:

It gave them insight; They understand more about breast cancer; Most people don't know men also get breast cancer; They will tell people at home when asked as well as the Grade 12 learners; The most of the information we wanted to deliver we did; For example they know now what a mammogram is and what to expect when they go to a hospital when they get one; We didn't get all the information through that we wanted but the information we didn't get through was more physics; They didn't know anything about mammograms or Radiography but now they know more; Most of them didn't know about self examination and mammography for example which they learned now; The Grade 12 learners will spread the information.

These statements also confirmed that students believed that the Grade 12 learners would spread the information, that the students achieved the intended purpose and that community health will be affected positively.

5.7.33.3 Categories for partially addressed

Some students believed that community needs had been only partially addressed and the following categories explain why they were of this opinion.

Categories 35.8 – 35.10

Students said that *Not all were science learners* (2003, 2004) and consequently the needs of the community were only partially addressed. One student reported that *Grade 12 learners did not understand everything* (1013); the reason could be that not all Grade 12 learners were science learners. Three students felt they should have done *More CUT marketing* (2027, 2029 and 2037) during the community engagement. This was the opinion of the students, and similar sentiments were expressed by some of the Grade 12 learners. In this context it is important to note that even non-science Grade 12 learners reported that they had learned a lot (cf. Section 5.4.1.3).

5.7.33.4 Reflection discussion

Individuals clarified their perceptions of partial success in addressing community needs with statements such as *Partially, we did not finish*. At one school students could not finish their presentation due to scheduling problems at the school. The following statement was made by one group: *I felt unless they are interested in Radiography the information was not relevant. For example the boys are not interested in the mammogram*. It is a view that is worth attending to, though it is clear that the students fail to see the relevance of the subject matter presented to society as a whole.

5.7.34 Theme 36

The final question of the student reflection rubric asked students, *How can the relationship between the CUT and the community in relation to the service-learning be improved?*

5.7.34.1 Singular categories

The singular categories presented below relate mostly organisational matters and the interaction having a broader impact.

Categories 36.1 – 36.5

Individual students were of the opinion that the community should be more involved in the SL process and should not consider it to be less important than other school activities: *Explain importance of SL to community* (2026). This statement could be the result of a

scheduling problem (double booking of the school hall) that occurred at one of the schools. Two students believed that *Explaining importance of SL to community* could also be accomplished by allocating *More resources* (2020) and *Funding* (2005) to SL. These comments refer to the scalability of SL in reference to the exercise having a more powerful impact, and these comments can additionally be linked to expansion of the project by doing *More community projects* (2008) and getting *Other disciplines* (1020) involved. The last comment suggests taking an interdisciplinary approach to SL, which will allow for influences from other disciplines through collaboration that should have a greater impact on and thereby improve relations with the community.

5.7.34.2 Category clusters <10 entrants

As shown in Table 5.67, some students believed that the relationship with the community is already good and that nothing needs to be done to improve it (Category 36.6).

TABLE 5.67: CATEGORY CLUSTERS <10 ENTRANTS

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 36.6	<i>Nothing</i>	1013, 2011, 2016, 2017, 2023, 2025, 2031, 2034
Category 36.7	<i>More interaction with learners</i>	2010, 2013, 2020, 2024, 2030, 2033
Category 36.8	<i>Hospital visit</i>	1014, 2007
Category 36.9	<i>Lower grades</i>	1002, 1005, 1011, 1015, 1029
Category 36.10	<i>Campus visit</i>	1021, 2007
Category 36.11	<i>More schools</i>	1002-1004, 1006, 1019, 2002, 2004, 2014, 2021, 2040
Category 36.12	<i>Better planning, scheduling</i>	2008, 2038
Category 36.13	<i>More consultation with community</i>	2001, 2036, 2039, 2041
Category 36.14	<i>Broader community, underprivileged</i>	2006, 2022, 2029, 2037

One student mentioned that there is no need for improvement because *the relationship is fine* (rubric 2023). The student who completed rubric 2024 specifically referred to more interaction with the learners during the first visit, during the meet and greet. Another student (rubric 2033) was of the opinion that, if there was more interaction, it would be possible to *test their level of understanding through questioning*.

A comment made about more community consultation, *understand the importance of SL* (rubric 2036), referred to the school with the double booking of the hall. Two other students had the same suggestion: *more commitment to SL* (2039, 2041). Students did a lot of preparation, and they were excited, but due to the scheduling problem they were disappointed.

5.7.34.3 Category clusters >10 entrants

Under this cluster and in relation to improving relationship with the community, there was only one category.

Category 36.15

More visits would improve the relationship between the community and the CUT. During this study, each group visited their communities three times during the year, and the positive responses from Grade 12 learners and contact persons had a positive effect on the students. Students' suggestion of more visits indicated a more socially responsive stance; more visits would serve the needs of both parties. Student comments also indicate their willingness regarding future participation, which correlates with the finding of Prinsloo *et al.* (2006:97), that students responded positively to future participation in similar community-engagement projects.

5.7.34.4 Reflection discussion

During the first visit to the schools, students only interacted with the contact person at each school. Students suggested during the interviews that they wanted to *meet Grade 12 learners during Visit 1; We have to meet them before the presentation; Have a meet and greet*. Students believed that, if they had *More interaction with the scholars*, it would improve relation between parties. Students thus suggest that relations can be improved if Grade 12 learners participated more: *Let them interact more; More feedback from them*. It was the students' responsibility to stimulate more participation from the Grade 12 learners' side, but it was the facilitators' responsibility to provide more guidance in this regard. Students also suggested ways of ensuring future Grade 12 participation: *Maybe we should give out prizes for example; Some of them were too shy to ask questions*.

In reference to the double-booking incident at one school, students' views were that the *contact person must be part of process. He has to drive it at the school. He must be into it; Put him on the line, but he was not committed; Better communication with the schools to ensure better commitment from their side*. Real life does not happen in a textbook, though the double-booking was unfortunate, it was also an opportunity for personal growth, which enabled students, through introspection, to learn how to deal with disappointment.

Students believed that the presentations were not enough to spread the message and that a permanent presence at the school would improve relations with the community. *Maybe create a flyer the next time, no longer than a page with pictures on, and take it to the school.*

Students have to affiliate themselves with the purpose, procedure and management of the SL process. This is achieved through proper orientation in class and in the community; here the community voice should be heard and the results confirms this importance. The results also show that the management of SL plays an important task in cultivating social responsiveness and allowing for learning to happen.

5.8 VISIT 3: RADIOGRAPHY STUDENT REFLECTION RUBRICS AND REFLECTION DISCUSSIONS

The reflections of the Radiography students after Visit 3 are presented in this section. This is the same rubric that was completed during the second visit. This rubric was also used during the discussions with each group after the intervention. For most of the questions of this rubric the feedback from students was similar. This is why similarities between the different visits will be summarised and the differences between the visits will be presented in more detail.

During Visit 3 in 2012, 25 rubrics were distributed among Radiography students, 24 returned the rubric, giving a return rate of 96%. The return rate for the same visit during 2013 was 97.7% (42 returned from 43 distributed).

Themes 1 to 12 were questions asking students to examine and analyse the SL experiences from the *Academic Learning and Enhancement Domain*.

5.8.1 Theme 1

Students were asked, *What did you learn from the scholars?*

5.8.1.1 Similar categories

Most of the feedback received from the students failed to answer the question, and relates, instead, to how students were supposed to interact with the Grade 12 learners in order to have a successful engagement.

TABLE 5.68: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 1

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 1.1	Attentiveness	1024, 1025, 1027, 1028, 1034, 1038, 1040, 1041, 2056, 2058, 2059, 2078, 2079, 2080, 2082, 2085
Category 1.2	<i>Nothing</i>	1023, 1036, 1042, 2044, 2046, 2048, 2049, 2054, 2057, 2060, 2063, 2064, 2067-2069, 2074, 2083, 2087
Category 1.3	<i>Have to simplify info</i>	1031, 1032, 1035
Category 1.4	<i>Patience</i>	1030

As shown in Table 5.68, student rubric 1032 (Category 1.3) included the following comment: *me and them*, indicating that simplifying the information would benefit both students and Grade 12 learners.

5.8.1.2 *Different categories*

Categories that were not captured during Visit 2 will be presented in this section.

Categories 1.5 – 1.7

Related to simplification of information, one student (1037) said, *thorough explanation important*, and another student (2051) stated that he/she should be *well prepared for questions*. These two comments, as well as *Service-Learning improves knowledge sharing*, represented evidence of personal growth and social responsiveness rather than academic reciprocity.

When asked, *What did you learn from the scholars?* social responsiveness was displayed by some students, who said that *Learners want to learn more* (2053, 2055, 2061, 2065, 2070-2073).

5.8.1.3 *Reflection discussion*

Most of the Visit 3 interview comments indicated that students felt that they had not learned much from the Grade 12 learners: *Not really anything*. Student groups indicated that the intervention was more successful than the first presentation: *The first time we were jittery; We were also more relaxed and chilled*, but that they did not learn as much as during Visit 2: *Not really different from previous time* and *Similar as previous time*.

One group clarified “not much” by adding, *I think it was nice to know that they did know about the Doppler and they add things to the discussion.*

Some groups reported, *Didn't learn anything from the kids*, and *No nothing, sir*, confirming they did not learn anything from the Grade 12 learners.

5.8.2 Theme 2

Students had to answer the same question in relation to their fellow students.

5.8.2.1 *Similar categories*

As was the case during Visit 2, students provided feedback associated mostly with teamwork and academic work, as shown in Table 5.69.

TABLE 5.69: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 2

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 2.1	<i>Presentation skill</i>	1024, 1034, 2056, 2067, 2070
Category 2.2	<i>Academic work</i>	1025, 1031, 1036, 2043, 2044, 2046, 2047, 2049, 2051, 2052, 2072, 2081
Category 2.3	<i>Teamwork</i>	1022, 1025-1031, 1033-1042, 1044, 2050, 2054, 2055, 2056-2064, 2065, 2069, 2075, 2078, 2082, 2086

Under *Presentation skills*, the student who completed rubric 2067 continued by saying, *Enthusiasm*. Additional comments of *Hard work and commitment* (2062), *Understanding and accommodating others* (2064) and *Each brain is a masterpiece on its own* (2082) elaborated on Teamwork.

5.8.2.2 *Different categories*

Categories that were not captured during Visit 2 are presented in the following sections.

Categories 2.4–2.6

Feedback from one student (1048), namely, *How to break down information in order to understand*, cannot be associated only with simplification of information, but also with the

importance of *collaborative learning* (2066). Two students answered, *Not much* (2068, 2074) in reference to the question, *What did you learn from your fellow students?*

5.8.2.3 Reflection discussion

During the interviews, one group reported that they learned something from their fellow group members but *It was the same, not much*. Other groups suggested that they learned something from other students by saying, *Yes: Did get some new information in regards to academic works, for example ultrasound was explained more and how we explained it to each other made it simpler and clearer*. These comments indicate the value of collaboration. This was confirmed by others: *Yes, sir. Something I was not sure and a fellow student to explain it to me so I understood better. Another student also gave a lot of indications for the ultrasound*. A different group referred to the use of more sources and how it aids collaborative learning: *Yes, some of the group members used a lot of different sources and what I've learned is that through a lot of resources you get a broader understanding of the whole thing; I understood certain things incorrectly and it was explained differently*.

5.8.3 Theme 3

Students were asked, *What differences are there between the academic material as presented in the course, and what you discovered during preparation and execution of the presentation?*

5.8.3.1 Similar categories

The similarities presented in Table 5.70 were complimentary rather than contradictory.

TABLE 5.70: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 3 (table continues on next page...)

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 3.1	<i>Graphics</i>	1035
Category 3.2	<i>More sources</i>	1022, 1028, 1034, 1037, 1038, 1040, 1044, 2045, 2047, 2051, 2053, 2056, 2074
Category 3.3	<i>More practical</i>	1029, 1031, 1038
Category 3.4	<i>Not much</i>	1030, 1031, 2043, 2046, 2052, 2064, 2069, 2070, 2072, 2057, 2059, 2064
Category 3.5	<i>SL simplify</i>	1024, 1026, 1031, 1033, 1039, 1041, 2048, 2071, 2076, 2078, 2083
Category 3.6	<i>None</i>	1025, 1027, 1032, 1042, 1043,

		1045, 1046, 2044, 2049, 2050, 2054, 2055, 2061-2063, 2066, 2067, 2073, 2075, 2077, 2079, 2080, 2084, 2086
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The student who completed rubric 1044 (Category 3.2) added that *Research allows students to work on their own*, indicating self-discovery.

5.8.3.2 Different categories

Categories that were not captured during Visit 2 are presented as Categories 3.7 and 3.8.

Categories 3.7–3.8

In relation to Category 3.2 and the above-mentioned comment (rubric 1044), a different student believed that, because students had to do research, they were forced to work on their own and thus *Self study improved* (1036). The three students (2060, 2065 and 2068) who indicated that the presentation should be *More informative* displayed responsiveness to the community's needs.

5.8.3.3 Reflection discussion

The feedback provided in the reflection rubrics and Visit 2 interviews were confirmed by student comments: *No not really any difference* and *No, sir, no real differences*. As in the reflection rubrics, students said, *You seem to go into deeper detail when you research and have different resources; In practice you just know the basics and they don't allow you to elaborate on what you already know; The fact that we used more resources and a variety of things that is the difference between what happened in the classroom and what happened when we prepared*.

The feedback referring to simplification (Category 3.5) was confirmed during the interviews. *We had to understand everything and explain differently: When we were doing the presentation it was explained from the patients' side not from the technical side that we were doing*.

5.8.4 Theme 4

Students had to indicate the significance of the differences mentioned in Section 5.8.3 and were asked, *Are these differences significant enough to alter the outcomes of the learning units?*

TABLE 5.71: RESPONSES FOR THEME 4

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 4.1	<i>Yes</i>	1028, 1034, 1037, 1041, 1044, 2043, 2048, 2053, 2056, 2058, 2060, 2064, 2071, 2074, 2080
Category 4.2	<i>No</i>	1022, 1024-1027, 1029-1031, 1033, 1035, 1036, 1038-1040, 1043, 1045, 1046, 2044-2047, 2049-2052, 2054-2055, 2057, 2061-2063, 2065-2070, 2072-2073, 2075-2079, 2083-2086

Table 5.71 shows that this was not the case for Visit 3, namely, that the difference between the academic material as presented in the course, and what they discovered during preparation and execution of the presentation, was not significant. The student who completed rubric 1037 (Category 4.1) said, *Yes*, the differences were significant, and explained that *More independent work is required*.

5.8.4.1 Reflection discussion

During the reflection interviews all groups were of the opinion that *No differences that needs to be changed* and *No need to change outcomes*.

5.8.5 Theme 5

Students were asked, *What are the possible reasons for any differences?*

5.8.5.1 Similar categories

Similar to Visit 2's feedback, students again referred to the different teaching and learning approaches used during SL. However, most of the feedback indicated that there was no difference and thus no reason for differences as asked under Theme 5 (cf. Table 5.72).

TABLE 5.72: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 5

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 5.1	<i>Student self-discovery</i>	1044
Category 5.2	<i>Practical</i>	1028, 1029, 1033, 1035, 2053, 2056, 2072
Category 5.3	<i>SL simplify</i>	1024, 1026, 1027, 1031, 1040, 2074, 2078
Category 5.4	<i>More sources</i>	1030, 1034, 1039, 1044, 2046, 2083, 2085
Category 5.5	<i>No difference</i>	1023, 1025, 1032, 1034, 1045, 1046, 2044, 2049-2052, 2054-2055, 2059-2060, 2061-2063, 2066-2067, 2069, 2071, 2073, 2075-2077, 2080, 2084, 2086

5.8.5.2 *Different categories*

Categories not mentioned during Visit 2 are presented below.

Categories 5.6 – 5.8

Time for lecturing limited (1037) was a reason given by one student for possible differences. This statement, plus one referring to self-discovery (cf. Table 5.72) indicates that students are realising their responsibility regarding their academic work. One student indicated the facilitator's responsibility to provide clear outcomes in his/her statement, *Outcomes unclear* (1044). Students also referred to the *Different levels of education* (2065, 2068, 2081) amongst group members as a reason for the differences between the academic material, and what you discovered during preparation and execution of the presentation. Collaborative learning was a result of students in the different groups dividing the outcomes to be addressed amongst the group and collating the information before the presentation.

5.8.5.3 *Reflection discussion*

The interview feedback, *The information was in a simpler form it made it easier again*, confirms that more sources and a different approach (self-discovery and more practical) added value to the preparation and intervention itself. One group mentioned that, as during Visit 2, this was also the case during Visit 3: *for this one as well*.

5.8.6 Theme 6

Students had to make suggestions for *How identified differences could be addressed?*

5.8.6.1 *Similar categories*

The limited feedback (Categories 6.1 & 6.5) was unique, with *Nothing to address* being the largest category, as can be seen in Table 5.73.

TABLE 5.73: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 6

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 6.1	<i>Lecturer assistance</i>	1035
Category 6.2	<i>More sources</i>	2046, 2083, 2085
Category 6.3	<i>Simplify classes</i>	1026, 1040, 2048, 2078, 2082
Category 6.4	<i>Research assignments</i>	2045, 2072
Category 6.5	<i>More studying</i>	1034
Category 6.6	<i>Classes more practical</i>	1028, 1029
Category 6.7	<i>Nothing to address</i>	1022, 1027, 1031-1033, 1036, 1042, 1045, 1046, 2044, 2049-2069, 2073-2077

Students suggested that *A broader introduction at the beginning of each chapter* (2078) should be used and that the *Layout of the SL outcomes were different* (2082). The reader should keep in mind that the SL outcomes come from SWD30AT and KLD30AT and have not been altered. The learner-centered approach, self-discovery and simplification of information associated with SL were most likely the reason for the differences.

5.8.6.2 *Different categories*

Categories not mentioned during Visit 2 are presented below.

Categories 6.8 – 6.9

Diverse teaching methods (1044) were suggested by one student; another student went further by suggesting *Collaborative learning* (2043). The different suggestions linked to the differences discovered can be associated with using different methods of teaching and learning, and not with the content itself.

5.8.7 Theme 7

Themes 7–12 enquired about students' experiences relating specifically to outcomes, theories and concepts. The first question asked, *How has this experience enhanced your knowledge of specific outcomes, theory or concepts?* The results of the *Yes* answers are presented in Sections 5.8.7.1 – 5.8.7.3.

5.8.7.1 *Similar categories*

As in Visit 2, having been exposed to outcomes, theories and concepts during class, students' knowledge was enhanced by repetition. Students created their own knowledge during preparation, reached new insights and could reinforce their knowledge by interacting with more sources and with group members.

TABLE 5.74: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 7

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 7.1	<i>Revision</i>	1032, 1035, 1041, 2083
Category 7.2	<i>Preparation</i>	1022, 1029, 1034
Category 7.3	<i>Collaborative learning</i>	1034
Category 7.4	<i>More knowledge</i>	2049, 2056, 2060, 2065, 2068, 2075, 2085
Category 7.5	<i>Simplification towards improved understanding</i>	1023, 1024, 1030, 1031, 1037, 1040, 1043, 1045, 2050, 2052, 2054-2055, 2057-2058, 2061-2063, 2070-2074, 2076-2077, 2080-2081, 2084
Category 7.6	<i>Yes</i>	1022, 1027-1037, 1039, 2048
Category 7.7	<i>Clarify outcomes</i>	2044, 2045, 2047, 2059, 2079
Category 7.8	<i>Additional info</i>	1027, 1033, 1036, 1039, 1042, 1043, 1046, 2043, 2069

As shown in Table 5.74, at least 13 students gave merely an affirmative *Yes*, and did not provide any further explanation.

5.8.7.2 *Different categories*

Categories that were not captured during Visit 2 are presented in Categories 7.9 - 7.12.

Categories 7.9 - 7.12

Linked to *Self-discovery* (2053), which was also mentioned for the same theme of Visit 2, one student stated that *Working independently* (1044) enhanced his/her understanding of the academic work. Another student (2078) clearly mentioned that he/she *Learned a lot about research* while another student (2046) reported that he/she *Learned new concepts* that enhanced his/her knowledge.

5.8.7.3 Reflection discussion for YES

As with the reflection rubric feedback, the interviews confirmed that students *Reinforced our prior knowledge through revision*. A different group said, *It was revision of work we did in class. We got a better understanding, using other sources*. The latter feedback indicates collaborative learning.

Other groups merely affirmed that enhancement of the academic work did happen: *Yes* and *Yes it did*.

5.8.7.4 Different category for NO

As in the case of Visit 2, there was only one student who said *No*, this experience did not enhance his/her knowledge of specific outcomes, theories or concepts. For category 7.13, the student who completed rubric 1038 reported that, because the work was *Done in class already*, their knowledge was not enhanced.

5.8.7.5 Reflection discussion for NO

The single reflection rubric feedback of *No* was confirmed during the interviews by the statement, *Not really because there were things that we already knew because we learned in class*.

5.8.8 Theme 8

Students were asked, *Does it reinforce your prior understanding?*

TABLE 5.75: RESPONSES FOR THEME 8

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 8.1	<i>Yes</i>	1022-1024, 1026-1037, 1039-1041, 1043-1046, 2043-2052, 2054-2055, 2057-2061, 2054-2055, 2063-2066, 2068-2071, 2073-2086
Category 8.2	<i>No</i>	1038, 1042, 2053, 2056, 2062, 2067, 2072

From Table 5.75 it is clear that more students believed that the SL intervention reinforced their prior understanding of the course work than did not.

5.8.8.1 Reflection discussion

As was the case during Visit 2, all five groups said, *Yes*, when asked whether their knowledge had been reinforced during Visit 3.

5.8.9 Theme 9

Students had to explain their feedback for Theme 8 by explaining, *In what ways?*

5.8.9.1 Similar categories

Conducting research, improving own understanding to improve that of others, and collaborating with group members reinforced students' knowledge (see Table 5.76). The feedback of the student who completed rubric 1044 made it clear that his/her knowledge was reinforced *with the help of my group*.

TABLE 5.76: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 9

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 9.1	<i>Student study, self-discovery</i>	2044, 2068
Category 9.2	<i>Knowledge broadened</i>	2045, 2046, 2052, 2055, 2057, 2086
Category 9.3	<i>New information</i>	1045
Category 9.4	<i>Revision</i>	1022, 1031, 1032, 1041, 2061
Category 9.5	<i>More detail during preparation</i>	1023, 1028, 1029, 1033, 1034, 1036, 1037, 1039, 2046
Category 9.6	<i>Collaborative learning</i>	1041, 1044, 2054, 2070
Category 9.7	<i>Simplification towards improved understanding</i>	1023, 1024, 1026, 1027, 1030, 1031, 1035, 1040, 1043, 1046, 2043, 2049, 2063, 2065, 2069, 2071, 2073, 2083, 2085

The reinforcing effect of doing research was also pointed out by Kruger (2013:158) in a study on the effect of CE/SL on students from the Faculty of Health Sciences at the UFS. Students in this study revealed that CBE/SL engagement with the community required them to search for additional information and thereby acquire additional information, something that they otherwise would not have done.

5.8.9.2 Different categories

Different categories for Theme 9 will be discussed below.

Categories 9.8 – 9.10

One student (2048) mentioned that his/her knowledge was reinforced because he/she was *Able to teach others* and another student (2050) commented he/she was able to *Better differentiate between concepts* because of the SL intervention. Two students (2076, 2077) stated that their *Understanding increased* due to the activities associated with the SL exercise.

5.8.9.3 Reflection discussion

Similar feedback was given in the reflection rubrics of Visit 2 and the Visit 3 interviews: *It reminded us of things we forgot. Revision of previous work; We had to get into more deeper detail. We had to simplify it as well this to be able to explain it to others. We learned much more; Things like the Doppler; it made things a little bit clearer.*

5.8.10 Theme 10

Students had to answer the question, *Does it challenge your prior understanding?* They had to report if the discoveries relating to academic work that they made during the SL process gave them a different insight into the work.

TABLE 5.77: RESPONSES FOR THEME 10

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 10.1	<i>Yes</i>	1022, 1024, 1028, 1031, 1033-1035, 1037, 1039, 1046, 2043, 2045, 2046, 2051, 2054, 2060, 2062, 2069-2070, 2073-2074, 2077-2078, 2085
Category 10.2	<i>No</i>	1023, 1026, 1027, 1029, 1030, 1032, 1036, 1038, 1040-1045, 2044, 2047, 2049, 2050, 2052-2053, 2055-2059, 2063-2068, 2071-2072, 2075-2076, 2079-2084

In contrast to Visit 2 feedback, Table 5.77 shows that fewer students believed that the SL intervention challenged their prior understanding of the course work.

5.8.10.1 Reflection discussion

During the interviews, only one group said, *Yes*, their prior understanding had been challenged. The other groups presented similar opinions as reported in Table 5.77, by

saying, *No, No don't think so, No it made it better, No, not really* and *It was similar information to that we already had.*

5.8.11 Theme 11

For Theme 11, students had to clarify the responses they gave in Theme 10 by replying to the question, *In what ways?*

5.8.11.1 *Similar categories*

Similar categories for Theme 11 are shown in Table 5.78.

TABLE 5.78: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 9

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 11.1	<i>Clarify information for Grade 12 learners</i>	2043
Category 11.2	<i>Self-belief in my understanding vs. Grade 12 understanding</i>	1024, 1031, 1039
Category 11.3	<i>More detail</i>	1028, 1033, 1034, 1037, 1046, 2062, 2074, 2085
Category 11.4	<i>Learning orientation changed</i>	1028, 1040
Category 11.5	<i>Looking forward to knowing more</i>	2051
Category 11.6	<i>Understanding increased</i>	1035, 2054, 2060, 2065
Category 11.7	<i>Having to simplify</i>	1022, 2073, 2083
Category 11.9	<i>Learning orientation changed</i>	2070

The feedback for this theme related to either the use of a variety of sources during preparation, or having to simplify information, which is linked to both Grade 12 learners and the students themselves.

5.8.11.2 *Different categories*

Categories 11.10 – 11.11

The student who completed rubric 2045 wrote that his/her knowledge was challenged because only *One source* is used during class. The student reports using more sources during SL research. There were also students (2052-2053, 2059-2061, 2063-2064, 2066-2072, 2075-2076, 2081, 2084, 2086) who answered, *Not Applicable*, because there was no reason why their prior knowledge was not challenged.

5.8.11.3 Reflection discussion

The reflection discussions confirm the feedback from the rubrics relating to simplification and clarifying information: *You have to explain it in different terms. You can't learn like a parrot, you have to understand and explain it so they can also understand it.* Student comments during the interviews confirm the feedback that simplification affected both Grade 12 learners and students themselves.

One group added that, *It just reinforced what we already knew;* the implication is that their knowledge was not challenged.

5.8.12 Theme 12

The final question for the *academic enhancement and reciprocity domain* asked students, *What additional information would you need to put yourself in a better position to better understand the module content?*

5.8.12.1 Similar categories

Visit 3 categories that were similar to Visit 2 categories are shown in Table 5.79.

TABLE 5.79: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 12

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 12.1	<i>Understandable learning material</i>	2043
Category 12.2	<i>More info</i>	2050, 2054, 2055, 2058, 2076, 2083, 2084
Category 12.3	<i>Practical examples</i>	1035, 1045, 2052, 2072, 2078
Category 12.4	<i>Nothing additional needed</i>	1023, 1027, 1032, 1036-1039, 1041, 1043, 1046, 2049
Category 12.5	<i>More sources</i>	1023, 1026, 1031, 1033, 1040, 2046, 2047, 2051, 2062, 2063, 2070, 2085
Category 12.6	<i>Use of external consultants</i>	1042, 1044
Category 12.7	<i>More research</i>	2053, 2071, 2080
Category 12.8	<i>Nothing</i>	2086, 2056-2057, 2059-20610, 2064-2068, 2073-2075, 2081-2082

The student who completed rubric 1044 (Category 12.6) added that external consultants should be used *in relation to the outcomes.*

5.8.12.2 *Different categories*

The categories not mentioned during Visit 2 were Categories 12.9 and 12.10, which are discussed below.

Categories 12.9 – 12.10

One student said *Not much* (2069) additional information is needed by him/her to put him/herself in a better position to better understand the module content. Another student referred to the use of a variety of teaching and learning methods with his/her comment, *Group based education* (2044).

5.8.12.3 *Reflection discussion*

The suggestion to use more sources was echoed during the interviews: *Yes. The resources we used in class for academic purposes I personally feel are not enough we need more resources; Using different resources makes you understand the work even better and will simplify it even better; Still the same information but in different ways, some a little simpler, some more complicated.*

Two groups felt that no additional information was needed and remarked, *No. It's sufficient*, and *No nothing*, thus confirming the feedback from the reflection rubrics. During the interviews a student group suggested taking a more practical approach to teaching and learning by commenting, *Maybe real life situations. If you can just explain like if you are in the ultrasound room.*

The questions of Themes 13 to 30 ask students to examine and analyse SL experiences from the *Personal Growth and Social Responsiveness Domains*.

5.8.13 **Theme 13**

Students were asked, *How did this experience make you feel (positive and/or negative)?*

TABLE 5.80: RESPONSES FOR THEME 13

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 13.1	<i>Positive</i>	1023-1032, 1034-1041, 1043-1046, 2043-2055, 2057-2085
Category 13.2	<i>Negative</i>	1022, 1033, 1042, 2056

Most of the students experienced the third visit positively, as indicated in Table 5.80.

Similar results were achieved during Visit 2, but during Visit 3 there were fewer students who indicated that it was a negative experience.

5.8.13.1 Reflection discussion

In comparison to Visit 2, the interview feedback for Visit 3 was all positive, with the following comment being made: *This time around it was a positive experience.* Other comments from two other groups were, *Positive,* and *Positive experience.*

Another group also said why they experienced it as positive: *It was a positive experience; Giving back to the community: informing people about things that you know, things they totally don't know anything about; Nice feeling of helping people; Had to rely on group members.*

The student statements included characteristics of social responsiveness and positive reinforcement. Similar findings were made by Kruger (2013:156). In this study the majority of students who participated felt that SL can have a positive impact on community development. Students in Kruger's study also declared that they enjoyed serving the community, that they have an obligation to serve the community and that SL helped them to grow personally (Kruger 2013:155).

5.8.14 Theme 14

The follow-up question of Theme 13 was, *Should you have felt differently?* which required students to do self-examination.

TABLE 5.81: RESPONSES FOR THEME 14

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 14.1	<i>Yes</i>	1022, 1033, 2043, 2046, 2056, 2068, 2069, 2071, 2074, 2078, 2079, 2085, 2086
Category 14.2	<i>No</i>	1023-1032, 1034-1036, 1038-1044, 1046, 2044, 2045, 2047-2055, 2057-2067, 2075-2077, 2080-2084

Similar to Visit 2, there was more feedback of *No*, confirming that students had positive experiences. Ten students (2043, 2046, 2068, 2069, 2071, 2074, 2078, 2079, 2085, 2086) who indicated that they had positive experiences said that they should have felt differently. Two students (1022 and 1033) who indicated that it was a negative experience said that they should have felt differently. One student indicated that there

was *No active participation from the Grade 12 learners* (1033), which caused students to have a negative experience. One of the students (1044) who reported having a negative experience added that he/she should not have expected anything else.

5.8.15 Theme 15

Students then had to explain, *Why?* in relation to Theme 14, *Should you have felt differently?*

5.8.15.1 Similar categories

Compared to Visit 2 there was less feedback and fewer categories for this theme during Visit 3, as can be seen in Table 5.82.

TABLE 5.82: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 15
(table continues on next page...)

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 15.1	<i>Sharing information with the community</i>	2043, 2054
Category 15.2	<i>New experience</i>	1032, 1034, 2046, 2058
Category 15.3	<i>Positive reinforcement</i>	1026, 1035, 2059, 2068, 2071, 2078, 2086
Category 15.4	<i>Community benefits</i>	1022, 1023, 1030
Category 15.5	<i>Positive reinforcement</i>	1031, 1044
Category 15.6	<i>Enhances community knowledge</i>	1043, 2055, 2058, 2061, 2063
Category 15.7	<i>Preparation</i>	2056, 2060, 2072
Category 15.8	<i>I felt superior</i>	2052, 2085
Category 15.9	<i>Fear of public speaking</i>	2056, 2069
Category 15.10	<i>Giving back to the community</i>	2070, 2083

The feedback from students as presented in Table 5.82 illustrates social responsibility and personal growth. The one student (1022) who said it was a negative experience and that he/she should have felt differently indicated *Community benefits* as the reason for the change of heart. Two students (2078 and 2086) who mentioned *Positive reinforcement* also added *Grade 12s responded positively* and *I was afraid of presenting*, indicating personal growth. In contrast, the student (1044) who said it was a negative experience and that he/she should not have felt differently indicated the lack *Positive reinforcement* as the reason for the change of heart.

5.8.15.2 Different categories

Categories that were not captured during Visit 2 are presented below.

Categories 15.11 - 15.16

Categories not described for this theme before referred to the experience being *Better than Visit 2* (1025 and 1029) because students knew *What was to be expected* (1028 and 1039). In relation to group dynamics, *Team cohesion* (1040) was good; students reported that they *Functioned as a group* (2050). Finally, one student said (but did not state whether he/she considered it to be positive or negative) that he/she should have felt differently because *I am contributing* (1045).

Three students indicated that they *felt confident* (2075, 2077, 2084), with one student continuing by saying, *it confirms my ability to address people*.

5.8.15.3 Reflection discussion

The student feedback relating to their experience and subsequent reflection about it shows personal growth: *It was a positive experience; We had more self confidence this time than we had the first time; The first time we did not know what to expect and how they will react to what we were saying; We were used to the environment*. Similar comments from another group were, *We were already used to the school; We knew what to expect*. Other student reflections illustrate aspects of social responsiveness, such as social growth, a sense of caring for others, and a sense of belonging (Duckenfield & Swanson 1992:5): *Beneficial to us and to the other people*, and *They welcomed us because they learned something the last time*.

Student comments during the interviews also revealed reciprocity through the enhancement of the curriculum: *It also enhanced our knowledge in for example ultrasound; we didn't have an obstetric ultrasound in class*. This comment refers to the mock examination students performed during the presentation.

5.8.16 Theme 16

The results for Theme 16, *Did you, or did you not, experience difficulty working/interacting with your group?* are given in Table 5.83. Contrary to Visit 2, the results for Visit 3 revealed that most of the students *did not experience any difficulty* during group interactions. Students demonstrated personal growth and an increased sensitivity and responsiveness towards their group members during Visit 3.

TABLE 5.83: RESPONSES TO QUESTION WHETHER STUDENTS EXPERIENCED DIFFICULTIES DURING GROUP INTERACTION

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 16.1	<i>Yes</i>	1022-1028, 1033-1035, 1044, 2043-2047, 2065, 2066, 2070, 2085
Category 16.2	<i>No</i>	1029-1031, 1032, 1036-1043, 1045, 1046, 2048-2060, 2062-2064, 2067-2069, 2071-2084, 2086

5.8.16.1 Reflection discussion

Interview comments of four of the five groups indicate that, although there were minor problems, they did not experience difficulties with group members: *We didn't find any difficulties this time; We had less time so there was more pressure on us but we managed it; We did a better job because we were so under pressure we wanted everything done on time so we actually worked together to finish everything on time.*

Student comments again reveal personal growth, but also collaboration, teamwork, management skills and critical thinking. Other comments with similar opinions were, *No, No. The technique we used now was different from the first one, we learned from the first experience,* and, *No. We learned a lot from each other from the first experience.*

Twenty percent of the groups indicated a contrary view to the one above: *Yes. We thought it would be better from the previous time but this time it was worse in comparison to previous time.*

In contrast to the rubric feedback, more groups believed that they did not experience difficulties when working with fellow group members. The feedback during the interviews could have been affected by group dynamics, like peer pressure, or societal demands, like conformity. This being said, it could also be that the interviews allowed for flexibility and more depth in student feedback.

5.8.17 Theme 17

Students had answer the same question as for Theme 16, but this time they had to evaluate their interaction with the community, *Did you, or did you not, experience difficulty working/interacting with the community?*

TABLE 5.84: RESPONSES TO WHETHER STUDENTS EXPERIENCED DIFFICULTIES DURING COMMUNITY INTERACTION

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 17.1	<i>Yes</i>	1024-1026, 1032, 1042, 1045, 1046, 2046, 2052, 2055, 2069, 2085
Category 17.2	<i>No</i>	1022, 1023, 1027-1031, 1033-1039, 1041, 1043, 1044, 2043-2045, 2047-2051, 2053, 2054, 2056-2068, 2070-2084, 2086

During Visit 3 there were more *No* responses, as can be seen in Table 5.84. Most students did not experience any difficulty working with the community – this can be due to students being familiar with their community. It indicates social responsiveness—students were able to get beyond identities and move towards affinities (Donahue *et al.* 2003:17).

The student who completed rubric 2085 indicated that he/she experienced difficulties working with both the group and the community.

5.8.17.1 Reflection discussion

The comments during the interviews once again stated that the students had not experienced serious difficulties: *Not really; Only thing they called me on my name; Not really just the postponement, No, and, No. It was really enjoyable.* The only *Yes* comment during the interviews was explained as follows: *Yes. Was a bit of disturbance during our presentation and the organisation. We were almost derailed but we were able to recover. Some Grade 12 learners were sleeping and didn't know what was happening.* This response could be classified as a *Yes* or a *Not really*, nevertheless previous exposure to the community facilitated personal growth, and students become more responsive to community needs.

5.8.18 Theme 18

Students then had to make suggestions in reference to the question, *What could you do differently next time to minimise such difficulties or improve the relationships in the group further?*

5.8.18.1 *Similar categories*

Similar feedback for this theme was given for Visit 2 and Visit 3, as presented in Table 5.85. When compared to Visit 2, Visit 3's feedback for this theme related more to organisational than personal problems, with communication the second-most-frequently cited category.

TABLE 5.85: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 18

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 18.1	<i>Group communication</i>	1022, 1023, 1026, 1028, 1035, 2044, 2045, 2047, 2048, 2050
Category 18.2	<i>Group cooperation</i>	2046
Category 18.3	<i>Time management</i>	1027, 1044, 2061, 2070, 2071,
Category 18.4	<i>Group support</i>	1033-1035, 2054
Category 18.5	<i>Punctuality</i>	2044
Category 18.6	<i>Trust others</i>	1032
Category 18.7	<i>Nothing</i>	1029-1032, 1038-1040, 1042, 2053, 2055-2057, 2059, 2060, 2062-2064, 2067, 2068, 2073-2077, 2080, 2082, 2084, 2086
Category 18.8	<i>Choose a leader</i>	2065
Category 18.9	<i>Better preparation</i>	2058, 2069, 2078, 2081, 2083

The category with the highest frequency was *Nothing*, which could indicate that there were no or minimal difficulties because there is nothing to improve.

5.8.18.2 *Different categories*

The categories not mentioned during Visit 2 were Categories 18.10, 18.11 and 18.12, which are discussed below.

Categories 18.10 – 18.12

Three students (1043, 1045, 2043) suggested better *Teamwork*, which suggests that they had experienced both organisational and personal problems. The students who had completed rubrics 2052 and 2072 were of the opinion that *More research* activities would lead to better group interaction. Collaborative research, as suggested by these two students, would lead to improved interpersonal skills and would minimise difficulties.

The student who completed rubric 2085, indicating that he/she experienced difficulties working with both the group and the community, suggested, *Choose a topic I am more comfortable with and prepare better*, as a way to minimise difficulties with the group.

5.8.18.3 *Reflection discussion*

During the interviews one group said, *Nothing*, which could indicate that there were no or minimal difficulties, because there is nothing to improve (cf. Section 5.8.18.1).

The interview revealed instances where the problems of Visit 2 persisted, even after the group had addressed the problem: *Previously we said we were going to talk to the individual but still it did not work*. This was the only comment of this nature; it related to an individual and can thus not be generalised.

The range of categories for Theme 18 of Visit 3 was smaller for Visit 2's feedback, which could indicate a general sense of sensitivity, of personal growth and of personal satisfaction. Students demonstrate social growth through the ability to work with others, through acceptance and awareness of diversity and multicultural backgrounds (Duckenfield & Swanson 1992:5).

5.8.19 Theme 19

Students were then asked, *What could you do differently next time to minimise such difficulties or further improve on the relationships with the community?*

5.8.19.1 *Similar categories*

Similar categories for Visit 3 as in Visit 2 are presented in Table 5.86.

TABLE 5.86: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 19

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 19.1	<i>None</i>	1022, 1027, 1029, 1031, 1033, 1039, 2051, 2053, 2056, 2057, 2059-2065, 2073-2077, 2080, 2084
Category 19.2	<i>Simplify information more</i>	1034, 1040, 1042, 2043, 2052, 2071
Category 19.3	<i>Interact with Grade 12 learners</i>	1030, 1038, 2045, 2046, 2066, 2068, 2072, 2081
Category 19.4	<i>Presentation skills</i>	1043, 2054
Category 19.5	<i>Preparation</i>	2047
Category 19.6	<i>Scheduling</i>	1041, 2058
Category 19.7	<i>Preparation</i>	2047
Category 19.8	<i>More visits</i>	1028, 2078
Category 19.9	<i>More confidence</i>	1026, 1032, 2047, 2050

The categories in Table 5.86 reflect personal-growth aspects, organisation issues and social responsiveness elements, but the category with the highest frequency was *Nothing*. Students were of the opinion that the engagement did not need any improvement, illustrating that, like Visit 2, the purpose of the interaction had been realised, and that their responses to community needs had been appropriate. Transformation took place through contextual border crossing on (a) a personal level, prior experience, and (b) a structural level, race, class, culture and ethnicity. In SA, on (c) a historical level, contextual border crossing of programmatic factors due to intercultural immersion, led to change (Kiely 2005:8).

5.8.19.2 *Different categories*

The single category not mentioned during Visit 2 was Category 19.10, which is discussed below.

Category 19.10

Four students (1044-1046, 2085) asked for a *More organised environment* in reaction to the disturbances mentioned in the interviews. Student statements suggest that students believed that they were prepared and organised and had to apply critical thinking to resolve problems caused by unforeseen circumstances.

5.8.19.3 *Reflection discussion*

During the interviews students again expressed their amazement and dissatisfaction with the unforeseen occurrences and disturbances during their interaction with the community. This can be deduced from student comments such as, *No disturbances; Lock doors, switch off the intercom.*

5.8.20 Theme 20

In response to the question, *What assumptions did you bring to the situation?* students had to indicate *which of the above proved true* and *which did not*.

TABLE 5.87: RESPONSES TO ASSUMPTIONS MADE, AND THEIR VALIDITY

CATEGORY NO.	CATEGORIES	RUBRIC NO. PROVED TO BE TRUE	RUBRIC NO. DID NOT PROVE TO BE TRUE
Category 20.1	<i>None</i>	1023, 1032, 1038, 1044, 1049, 2048, 2049, 2051, 2053-2056, 2059, 2061, 2069, 2073, 2086	
Category 20.2	<i>Good teamwork</i>	1026, 1034, 1045, 2076, 2084	
Category 20.3	<i>Scholars not attentive</i>		1028, 1037, 1043, 1046, 2060, 2067
Category 20.4	<i>People are difficult (group)</i>	1026	
Category 20.5	<i>Grade 12 learners' level of understanding high</i>	1022	1042
Category 20.6	<i>Bad teamwork</i>	1033	1030, 1031, 1043, 2045, 2064, 2079, 2082
Category 20.7	<i>Third visit better</i>	1027-1029	2068
Category 20.8	<i>Working in a group is boring</i>		1036
Category 20.9	<i>Grade 12 learners would participate, familiar with work</i>		1040
Category 20.10	<i>Group conflict</i>	2045, 2066	2045
Category 20.11	<i>Difficult task</i>		2052
Category 20.12	<i>Successful presentation</i>	2065, 2070	
Category 20.13	<i>Learners will not ask many questions.</i>	2063	
Category 20.14	<i>Learners did not know anything about the topic and would find the presentation boring.</i>		2072
Category 20.15	<i>Learners will not be interested</i>	2074, 2077	2075, 2078

For Visit 3 students made fewer assumptions, which is to be expected because of previous interactions during Visit 2. Students had a clearer picture of the community setting and the community itself; students had gained precious interpersonal skills during Visit 2, which had a positive effect on the third visit. The dissonance associated with incongruence between students' prior frames of reference and aspects of the SL experience was addressed through personalising, that is, by the way individual students responded to and learned from different types of dissonance (Kiely 2005:8). New assumptions were, *Working in a group is boring*, and *Grade 12 learners would participate, familiar with work*. *Group conflict* (rubric 2045) had mixed feedback because, overall, everything proceeded well despite the *slight arguments* that occurred.

5.8.20.1 Reflection discussion

The above-mentioned sentiments were echoed during the interviews, with comments such as, *No assumptions because we knew what we were getting ourselves into*, and, *We didn't bring any assumptions because of the previous one we already knew what to expect*. Personal growth was demonstrated by student statements of, *No! The last time we were there they gave us a good impression so we went this time with confidence*.

After reflection and repositioning, students were apprehensive about their new approach: *I thought that by using a different technique this time than previously by letting them be part I thought it was going to be chaotic, it was going to disrupt our structure*. This assumption however did not prove true, *but it was OK in the end it worked out*.

5.8.21 Theme 21

Most of the feedback for the question, *Have past experiences influenced the way you acted or the decisions you made during the process?* was in reference to previous group work and previous presentation during Visit 2. This time around only one student (1030) said that past experiences had *No effect* (Category 21.1) on his/her actions or decisions. As shown in Table 5.88, students had to indicate *whether the influence was positive or negative*.

TABLE 5.88: PREVIOUS EXPERIENCES AND THEIR EFFECTS

CATEGORY NO.	CATEGORIES	RUBRIC NO. POSITIVE	RUBRIC NO. NEGATIVE
Category 21.2	<i>Previous group assignments</i>	1023, 1032, 1034, 1035, 1038, 1044, 2045, 2049, 2050, 2053, 2073	1040, 1041, 2064
Category 21.3	<i>Conflict management</i>	1035, 2069	
Category 21.4	<i>Previous presentations</i>	1022, 1025, 1026 1029, 1033, 1044-1046, 2041, 2043, 2044, 2046-2048, 2050, 2056, 2057, 2060, 2063, 2068, 2070-2071, 2074, 2075, 2077, 2086	1037, 1039, 1042, 2072, 2074, 2085

In reference to *Previous presentations*, one student (rubric 1029) added, *knew what to expect* in reference to Visit 2. Another comment about previous presentations was, *I did not listen when I was Grade 12* (1037); this had a negative effect on the presentation.

Another student (1043) added to previous presentations, *I improved from the last SL experience.*

5.8.21.1 Reflection discussion

Four of the five groups reported that previous experiences had had a *Positive* effect on the third visit; they commented, *It was a positive influence*, and *Positive definitely*.

When students were asked to clarify their statements they said, *Previous presentations; At the end of the first presentation the contact person called us and then she told us what we were doing wrong for example we were facing with our backs; But now with this presentation we focused on the things she said we did wrong so we tried to do it better; Again we knew what we were getting ourselves into; We were jittery the previous time; We made sure the second time around we made sure we got there in time and we had everything we needed; We learned from the first time.*

Comments related to group work were, *The time schedule was better. This time everyone made their own slide show the last time one of us just took the information but this time everyone made their one.* Another group said, *Overcame certain issues more quickly*, was in reference to the previous SL presentation.

5.8.22 Theme 22

The next two questions on the rubric were, *What personal strengths of yours did the situation reveal?* and, *In what way did they affect the situation positively?*

5.8.22.1 Categories 22.1 - 22.7

Student replies are presented in Table 5.89, which excludes two students (rubrics 1032 and 2043) who were of the opinion that no strengths had been revealed. Table 5.89 presents the strengths and each one's multiple positive effects

TABLE 5.89: PERSONAL STRENGTHS AND THEIR POSITIVE EFFECTS PRESENTED AS SUBCATEGORIES

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY		RUBRIC NO.
Category 22.1	Confidence	Subcategory 22.1.1	<i>Presented well</i>	1025, 1026, 1029, 1033, 1042, 1046, 2060, 2068, 2086
		Subcategory 22.1.2	<i>Boosted confidence</i>	2044, 2056, 2057, 2063, 2072, 2074, 2077, 2085
Category 22.2	Determination	Subcategory 22.2.1	<i>Creative presentation</i>	1027
		Subcategory 22.2.2	<i>Management</i>	1040, 2052, 2065
Category 22.3	Presentation skills	Subcategory 22.3.1	<i>Expressing myself better</i>	1036
		Subcategory 22.3.2	<i>Presented well</i>	1025, 1033
Category 22.4	Communication skills	Subcategory 22.4.1	<i>Presented well</i>	1039, 1043, 1046
		Subcategory 22.4.2	<i>Good teamwork</i>	1022, 1030
		Subcategory 22.4.3	<i>Better expressing myself</i>	1037
Category 22.5	Team player	Subcategory 22.5.1	<i>Better expressing myself</i>	1034
		Subcategory 22.5.2	<i>Presented well</i>	1041
		Subcategory 22.5.3	<i>Good teamwork</i>	1030
Category 22.6	Self-esteem	Subcategory 22.6.1	<i>Better expressing myself</i>	1028
		Subcategory 22.6.2	<i>Presented well</i>	1029
Category 22.7	None	2064, 2066, 2067, 2083		

Student feedback regarding personal strengths that were revealed during the SL engagement is given in Table 5.89; the categories presented are further explained by specifying their effect using subcategories. The categories mentioned were factors that enhanced both the presentation itself as well as factors that ensured good interaction with others. Fewer categories and associated subcategories were revealed during Visit 3 in comparison with the same theme of Visit 2. Other than *Presentation skills*, *Self-esteem* and *None*, categories for Visit 3 were similar to those of Visit 2. The categories presented in Table 5.89 had a higher frequency than those presented in Table 5.90.

5.8.22.2 Categories 21.8 - 21.18

The strength categories with singular positive effect subcategories are now presented in Table 5.90.

TABLE 5.90: PERSONAL STRENGTHS AND THEIR POSITIVE EFFECTS

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY?	RUBRIC NO.
Category 22.8	Getting along with others	<i>Presented well</i>	2051
Category 22.9	Leadership	<i>Presented well</i>	1033
Category 22.10	Composure	<i>Presented well</i>	1035
Category 22.11	Adapt to change	<i>Better expressing myself</i>	2045
Category 22.12	Responsibility	<i>Boosted confidence</i>	2049
Category 22.13	Time management	<i>Presented well</i>	1041
Category 22.14	Initiative	<i>Presented well</i>	1033
Category 22.15	Public speaking	<i>Boosted confidence</i>	2047
Category 22.16	Learn from others	<i>Presented well</i>	1035
Category 22.17	Patience	<i>Stay calm</i>	1031
Category 22.18	Punctuality	<i>Good teamwork</i>	1023

During Visit 3 categories that had multiple subcategories for Visit 2 had single references, as seen in Table 5.90; these were *Getting along with others*, *Leadership*, *Time management* and *Public speaking*. New categories in Table 5.90 were *Composure*, *Adapt to change*, *Learn from others*, *Patience* and *Punctuality*. One student (2049) believed that acting responsibly boosted his/her confidence, and he/she explained the comment as follows: *Speaking to the group, taking the lead*.

5.8.22.3 Reflection discussion

Student comments during the interviews about the influence of their strengths can be listed under a group theme, namely, *Teamwork*. *We had a lot of work to do so there was a sense of responsibility, We can work under pressure; Keep your calm, and Good organisational skills*. Student comments during the interviews about the influence of their strengths were personal: *I've learned that I am a good listener; In order to be a good listener you must have good communication; Responsibility is also a strong one; Taking responsibility*.

The aforementioned illustrates social growth through acceptance and awareness of others from diverse and multicultural backgrounds and different peer group affiliations

(Duckenfield & Swanson 1992:5). It also shows intellectual growth as a result of problem-solving and decision-making skills (critical-thinking skills) and skills in learning from experience, and included developmental needs for better communication. Improved communication through the mastery of a second language was also mentioned by one of the groups: *The language itself with English because you had to learn it because it is not your mother tongue; You gain more confidence because you had to speak before strangers.*

Student responses indicated that their strengths affected the situation *Positively*; they elaborated, *We as a group decided to give each group member a responsibility and making sure that they delivered; We decided on different responsibilities in the group so that person had to be a leader in that certain subject and tell us what to do; We tried to correct the errors we made the first time around.*

5.8.23 Theme 23

After indicating the positive effect that their perceived strengths had had on the situation, students also had to respond to the question, *In what way did they affect the situation negatively?*

Categories 23.1 - 23.4

Results of the strengths and their multiple negative effects are presented in Table 5.91.

TABLE 5.91: PERSONAL STRENGTHS AND THEIR NEGATIVE EFFECTS PRESENTED AS SUBCATEGORIES

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION NEGATIVELY?		RUBRIC NO.
Category 23.1	Confidence	Subcategory 23.1.1	<i>Communication skills</i>	1026, 1042, 2072, 2074, 2080, 2085
		Subcategory 23.1.2	<i>Frustration</i>	1033
		Subcategory 23.1.3	<i>No effect</i>	2044, 2056, 2057, 2063, 2069, 2071, 2075, 2077, 2086
Category 23.2	Determination	Subcategory 23.2.1	<i>Impatience</i>	1027
		Subcategory 23.2.2	<i>No effect</i>	1040
Category 23.3	Communication skills	Subcategory 23.3.1	<i>No effect</i>	1037, 1039
		Subcategory 23.3.2	<i>Communication skills</i>	1043
		Subcategory 23.3.3	<i>Not assertive</i>	1022
		Subcategory 23.3.4	<i>Lack of perseverance</i>	1030
Category 23.4	Team player	Subcategory 23.4.1	<i>No effect</i>	1038, 1041

As for Visit 2, all the categories mentioned in Table 5.91 can be associated with interpersonal skills, which students believed to be strengths but the application of which could have been flawed or misinterpreted in the specific context. The subcategories clarify how students' perceived strengths could have had unwanted results in different situations. The subcategories can also assist students in future endeavours; first, assisting students to be more selective regarding their approaches to dealing with others, and second, assisting students to determine the extent to which these strengths can be used to advance future courses. The student who completed rubric 1042 (Category 23.1 Confidence Subcategory 23.1.1 *Communication skills*) and the student who completed rubric 1043 (Category 23.3 *Communication skills* Subcategory 23.3.2 *Communication skills*) added, *I spoke too fast*.

The students who completed rubrics 2072, 2074 and 2085 indicated that strengths had both a positive and a negative effect on the situations as follows: *Boosted self confidence and Communication skills–spoke to quickly (2072); I was confident and I avoided eye*

contact with the audience (2074), and *I was confident and felt superior* and *Presentation to long, loss of concentration by learners* (2085).

Categories 23.5 - 23.9

All the strengths mentioned in Table 5.92 can be associated with interpersonal skills; in some cases it affected the situation and in others it did not. Yet again, this interpretation by students of the effect of their strengths could lead to a more responsive approach to addressing community needs.

TABLE 5.92: PERSONAL STRENGTHS AND THEIR NEGATIVE EFFECTS

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID STRENGTHS AFFECT THE SITUATION NEGATIVELY?	RUBRIC NO.
Category 23.5	Self-esteem	<i>Nerves</i>	1028
Category 23.6	Respect	<i>Nerves</i>	1044
Category 23.7	Composure	<i>Bad time management</i>	1035
Category 23.8	Getting along with others	<i>No effect</i>	2051
Category 23.9	Public speaking	<i>No effect</i>	2047

Students were thus able to recognise personal weaknesses and were able to capitalise on this knowledge. Personal weaknesses also assisted organisational issues and improved group dynamics because students' weaknesses allowed space for others to improve. *Determination motivating others* is an example of this; on the other hand, determination also led to instances of conflict.

5.8.24 Theme 24

Students had to indicate, *What could you do to build on strengths?* Students thus had to clarify how they would build on the positive effects of the strengths they had mentioned and to how the negative effects could be minimised or prevented.

5.8.24.1 Similar categories

Similar feedback was given for this theme for Visit 2 and Visit 3; responses are presented in Table 5.93. Visit 3 had fewer categories for this theme than Visit 2; feedback related to

both organisational issues and personal problems, with communication being the category with the greatest frequency.

TABLE 5.93: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 24

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 24.1	<i>Better pronunciation</i>	1026, 2054, 2071
Category 24.2	<i>Better time management</i>	1034, 1040, 2052
Category 24.3	<i>More self-belief</i>	1022, 1025, 1036, 1044, 2053, 2055, 2056, 2066, 2069
Category 24.4	<i>More preparation</i>	1025, 1033, 2045, 2073, 2084
Category 24.5	<i>More practise</i>	1023, 1026, 1028, 1029, 1033, 1035-1037, 1039, 1042, 1043, 1045, 2044, 2057-2062, 2065, 2080, 2085, 2086
Category 24.6	<i>More attentive</i>	2074, 2083

5.8.24.2 Different categories

For this theme there were three additional categories (Categories 24.7 - 24.11) not mentioned during Visit 2.

Categories 24.7 - 24.11

Three students believed that there was *Nothing* (1030, 1031, 1041) they could do to build on their strengths; all three students indicated that their strengths had positive or no effects. One student stated that *More group work* (1038) would improve his/her strength of being a *Team player*. Another student indicated that *More community projects* (2051) would improve his/her strength of *Getting along with others*.

Students (2063, 2068, 2072, 2076) also suggested *More interaction* to improve their strengths; here introspection and social responsiveness promote personal growth. Personal growth was also demonstrated by two students saying that their strengths would be improved through *Improved confidence* (2075 and 2081).

5.8.24.3 Reflection discussion

Students reflected that poor organisation had a positive effect, because they had *Learned responsibility*. Students identified their weaknesses and were able to make suggestions

for improving them. Students displayed personal growth and responsiveness to others:
Listen more talk less.

5.8.25 Theme 25

Next, students had to reply to the question, *What personal weaknesses of yours did the situation reveal?* Students also had to state, *In what way did they affect the situation positively?* Nine students (rubrics 1030, 1031, 2022, 2048, 2053, 2057, 2067, 2071 and 2086) were of the opinion that no weaknesses had been revealed. The student who completed rubric 2085 commented, *Can do presentations fearlessly.*

Category 25.1 - 8

Table 5.94 presents the weaknesses and each one's multiple positive effects.

TABLE 5.94: PERSONAL WEAKNESSES AND THEIR POSITIVE EFFECTS PRESENTED AS SUBCATEGORIES
(table continues on next page...)

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY?		RUBRIC NO.
Category 25.1	Control freak	Subcategory 25.1.1	<i>Decreased stress levels</i>	2052
Category 25.2	Nerves	Subcategory 25.2.1	<i>Did not influence</i>	1022, 1032, 1038
		Subcategory 25.2.2	<i>Increased self-awareness</i>	1028, 1040, 2054
		Subcategory 25.2.3	<i>Wanted to finish presentation</i>	2056
		Subcategory 25.2.4	<i>Worked well under pressure</i>	2059
Category 25.3	Impatience	Subcategory 25.3.1	<i>Thing happened</i>	1027
		Subcategory 25.3.2	<i>Did not influence</i>	1023, 2070, 2076, 2083
		Subcategory 25.3.3	<i>Increased confidence</i>	2046
		Subcategory 25.3.4	<i>Input timely</i>	2063, 2064
		Subcategory 25.3.5	<i>Helped others</i>	2082
Category 25.4	Decreased confidence	Subcategory 25.4.1	<i>Increased self-awareness</i>	1045,2
		Subcategory 25.4.2	<i>Did not influence</i>	2055, 2062
Category 25.5	Public speaking	Subcategory 25.5.1	<i>Overcome fear</i>	2043, 2049, 2081
		Subcategory 25.5.2	<i>Did not influence</i>	2058
		Subcategory 25.5.3	<i>Positively</i>	2075, 2080
Category 25.6	Procrastination	Subcategory 25.6.1	<i>Did not influence</i>	1037, 2084
		Subcategory 25.6.2	<i>Good time management</i>	1036

Category 25.7	Time management	Subcategory 25.7.1	<i>Explaining things in detail improved learners understanding.</i>	2085
Category 25.8	Communication skills	Subcategory 25.8.1	<i>Did not influence</i>	1026
		Subcategory 25.8.2	<i>Problem areas identified.</i>	2061

For this theme there were fewer categories for Visit 3 than there had been for Visit 2. Students displayed self-awareness in identifying and understanding the positive influences their perceived shortcomings had had on the success of the SL engagement. Weaknesses confessed were personal and related to high-quality interaction with the community. The subcategories in Table 5.94 illustrate that students were able, through introspection, to apply self-control. The student who said that nervousness led to better self awareness (a positive result) added, *I was too confident and that became a problem.*

Categories 25.9 - 25.15

The perceived shortcomings with singular positive effect is presented in Table 5.95.

TABLE 5.95: PERSONAL WEAKNESSES AND THEIR POSITIVE EFFECTS

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY?	RUBRIC NO.
Category 25.9	<i>Ignorance of group dynamics</i>	<i>Positively</i>	2045
Category 25.10	<i>Decreased self-belief</i>	<i>Improved listening</i>	2050
Category 25.11	<i>Doing research</i>	<i>Increased confidence</i>	2046
Category 25.12	<i>Perfectionist</i>	<i>Things happened</i>	1039
Category 25.13	<i>Hoogdrawend [pompous]</i>	<i>Increased self-awareness</i>	1041
Category 25.14	<i>Multi-tasking</i>	<i>Attention to my stuff</i>	1035
Category 25.15	<i>Easily frustrated</i>	<i>No effect</i>	2065, 2066

The categories in Table 5.95 relate to personality issues and presentation-preparation matters. Students' perceived weaknesses had, in most cases, an unexpectedly positive effect on the situation.

5.8.25.1 Reflection discussion

The interview feedback was comprehensive, with one group stating that no real weaknesses had been revealed: *Nothing not really. The fact that we worked under pressure made us scared we didn't want to mess it up, maybe impatience.*

Another group mentioned some weaknesses and stated that they had a positive effect: *I am a perfectionist and I wanted things to run smoothly. In a good way. Everyone wanted it to be perfect; Most of us all had more or less the same personality, no one was shy.*

Lack of self confidence. I talk too fast, was the feedback from one group member about a weakness that did not have a negative effect on the situation. *They heard me although I talked too fast.*

The fact that fewer weaknesses with positive effects were revealed indicates that students learned from the previous experience and were more responsive during the third visit; they had grown on a personal level.

5.8.26 Theme 26

Students had to give feedback to the question, *In what way did they affect the situation negatively?* in relation to the weaknesses mentioned.

Category 26.1 - 8

The students' personal weaknesses and each one's multiple negative effects are presented Table 5.96. In this instance 13 students did not identify any weaknesses that affected the situation negatively (rubrics 1031, 1038, 1039, 2044, 2046, 2047, 2051, 2053, 2057, 2067, 2071, 2073 and 2086).

TABLE 5.96: PERSONAL WEAKNESSES AND THEIR NEGATIVE EFFECTS AS SUBCATEGORIES

(table continues on next page...)

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION POSITIVELY		RUBRIC NO.
Category 26.1	Control freak	Subcategory 26.1.1	<i>Some contributed</i>	2052
Category 26.2	Nerves	Subcategory 26.2.1	<i>Negative</i>	1038
		Subcategory 26.2.2	<i>Decreased confidence</i>	1022, 1025, 1032, 1045

		Subcategory 26.2.3	<i>Info not delivered</i>	1028, 1043
		Subcategory 26.2.4	<i>Presentation skills</i>	2043, 2056
		Subcategory 26.2.5	<i>Stuttered</i>	2054
		Subcategory 26.2.6	<i>Message not recieved</i>	2059
Category 26.3	Impatience	Subcategory 26.3.1	<i>Group conflict</i>	1027, 2063, 2076
		Subcategory 26.3.2	<i>I felt too domineering</i>	2064
		Subcategory 26.3.3	<i>Judgemental</i>	2070
		Subcategory 26.3.4	<i>Too much of a pusher</i>	2082
		Subcategory 26.3.5	<i>Negatively</i>	2083
		Subcategory 26.3.6	<i>Info not delivered</i>	1046
Category 26.4	Decreased confidence	Subcategory 26.4.1	<i>Mumbled</i>	2062, 2072
		Subcategory 26.4.2	<i>Did not influence</i>	2055
Category 26.5	Public speaking	Subcategory 26.5.1	<i>Did not speak audible</i>	2077, 2081
		Subcategory 26.5.2	<i>Did not influence</i>	2058, 2075
		Subcategory 26.5.3	<i>Too little time</i>	2080
Category 26.6	Procrastination	Subcategory 26.6.1	<i>I was nearly left behind</i>	2084
		Subcategory 26.6.2	<i>Not enough time</i>	1033
Category 26.7	Time management	Subcategory 26.7.1	<i>Presentation too long, students lost concentration</i>	2085
Category 26.8	Communication skills	Subcategory 26.8.1	<i>Poor time management</i>	1037
		Subcategory 26.8.2	<i>Presentation skills</i>	2061

The weaknesses mentioned for Visit 3 (Table 5.96) were more personal than those of the second visit's feedback of social cohesion and having a high-quality community interaction. In a personal context, decreased confidence affected group interaction, the presentation and group interaction negatively.

Category 26.9 - 14

The students' personal weaknesses and their singular negative effects are presented Table 5.97.

TABLE 5.97: PERSONAL WEAKNESSES AND THEIR NEGATIVE EFFECTS

CATEGORY NO.	CATEGORIES	IN WHAT WAY DID THEY AFFECT THE SITUATION NEGATIVELY?	RUBRIC NO.
Category 26.9	Lack of perseverance	<i>Negative</i>	1030
Category 26.10	Multitasking	<i>Other aspects of life neglected</i>	1035
Category 26.11	Communication skills	<i>Message not received</i>	1026
Category 26.12	Decreased confidence	<i>Decreased confidence</i>	1044, 1045
Category 26.13	Presentation skills	<i>Message not received</i>	1042
Category 26.14	Easily frustrated	<i>No effect</i>	2065, 2066

The categories presented in Table 5.97 were weaknesses of individuals within a group. The fact that these individuals now know what their weaknesses are and the effect those weaknesses can have places the students in a better position to apply restraint, when necessary, and thereby weaknesses can have a more positive effect on interaction.

5.8.26.1 Reflection discussion

Students revealed in the interviews that impatience did not affect the situation: *It didn't have an effect because although I was impatient I didn't take it out on the person, but, I could have had a better experience if I was not impatient.*

Poor time management was a behaviour that had a negative influence on the experience: *We had 17 days but we didn't do everything. We waited until 5 days before the presentation and we worked under pressure because of that.*

5.8.27 Theme 27

Students had to reflect on their weaknesses and explain, *What could you do to overcome weaknesses?*

5.8.27.1 Similar categories

Similar feedback as that given for Visit 2 for this theme was given for Visit 3; it is presented in Table 5.98. Two students (1039 and 2053) stated that there is *Nothing* that they could do to overcome the weakness.

TABLE 5.98: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 27

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 27.1	<i>Group communication</i>	2044, 2045, 2050, 2063
Category 27.2	<i>Speak slower</i>	1043, 2075
Category 27.3	<i>Time management</i>	1027, 1033, 1035, 1037, 2084
Category 27.4	<i>Practice patience</i>	1023, 2076, 2082
Category 27.5	<i>Positive thinking</i>	1043, 1044, 2065
Category 27.6	<i>Improve confidence</i>	2051, 2060, 2074, 2077, 2081
Category 27.7	<i>Practise</i>	1022, 1025, 1026, 1028, 1031, 1036, 1038, 1040-1042, 1045, 2043, 2056, 2059, 2061, 2064, 2080, 2086
Category 27.8	<i>Create own groups</i>	2052
Category 27.9	<i>More preparation</i>	2054, 2062, 2071, 2079

As during Visit 2 category for which the rubrics provided the most feedback was *Practice*. Practise can refer to more dress rehearsal, more presentations (rubric 2078 *added more exposed to presentations*), and can also include practising better group interaction.

5.8.27.2 Different categories

Two categories (Categories 27.10 - 27.13) not mentioned during Visit 2 emerged during Visit 3.

Categories 27.10 - 27.13

Collaboration with others can lead to personal growth: *Stress management* (1032), mentioned by one student, could be facilitated by *Interact more with others* (2061), *Team discussion* (1030) and *believing in other group members and their abilities* (2070).

5.8.27.3 Reflection discussion

More practise was suggested during the interviews: *Keep on practising. Practise makes perfect.* Another group's member indicated that weaknesses could be overcome if *I can calm myself.*

The students indicated that weaknesses could be overcome through personal and group effort. Ways to overcome weaknesses would help them to achieve personal growth, social growth and preparation for the world of work (Duckenfield & Swanson 1992:6).

5.8.28 Theme 28

Table 5.99 contain three different information sets, namely, personal values, beliefs and convictions, in reference to the question, *How did this situation reinforce personal values, beliefs and convictions?* The reflection involved in this question enabled students to experience significant change regarding the ways they understood their identities, cultures, and behaviour (Kiely 2005:8).

TABLE 5.99: RESPONSE TO REINFORCEMENT OF VALUES, BELIEFS AND CONVICTIONS
(table continues on next page...)

28.1.1 PERSONAL VALUES			28.1.2 BELIEFS		28.1.3 CONVICTIONS			
Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.
28.1.1.1	<i>Did not</i>	1023, 1032, 1038, 1042, 1043, 2048, 2049, 2056, 2064, 2077, 2080	28.1.2.1	<i>No effect</i>	1032, 1038, 1039, 1041- 1043, 2044, 2047- 2049, 2054, 2056, 2071, 2073, 2077, 2080	28.1.3.1	<i>Did not</i>	1023, 1032, 1038-1043, 1045, 2044, 2048, 2048, 2054, 2056, 2071, 2072, 2074, 2077, 2080, 2086
28.1.1.2	<i>Respect others' opinions</i>	1027, 1030, 2086	28.1.2.2	<i>Self-belief</i>	2043, 2046	28.1.3.2	<i>Community benefited</i>	1033, 2070
28.1.1.3	<i>Increased self-confidence</i>	1039- 1041, 2044, 2069	28.1.2.3	<i>Treat others with respect</i>	1033	28.1.3.3	<i>Self-confidence improved</i>	1026, 1027, 1035
28.1.1.4	<i>Mutual respect</i>	1022, 2084	28.1.2.4	<i>Positively</i>	1036, 1044, 2045, 2051, 2062, 2065, 2068	28.1.3.4	<i>Positively</i>	1036, 2045, 2051, 2062, 2065, 2068, 2083
28.1.1.5	<i>Self-belief</i>	2046	28.1.2.5	<i>Confidence to address others</i>	1026, 1027	28.1.3.5	<i>Do the best you can</i>	2052, 2055
28.1.1.6	<i>Tolerance of others</i>	2043	28.1.2.6	<i>Patience with others</i>	1035			
28.1.1.7	<i>Interact with others</i>	1025, 1044, 2052, 2070	28.1.2.7	<i>Always do your best</i>	1045, 2055			

28.1.1.8	<i>Teamwork</i>	1030	28.1.2.8	<i>Good in all people</i>	2050	
28.1.1.9	<i>Through helping others</i>	1028, 1045, 2050, 2063	28.1.2.9	<i>Helping others</i>	1023, 1024, 2063	
28.1.1.10	<i>Character building</i>	2047	28.1.2.10	<i>Believe in others</i>	1022	
28.1.1.11	<i>Perseverance</i>	1033, 1035	28.1.2.11	<i>Giving back to the community</i>	2070, 2084	
28.1.1.12	<i>Confidence to address others</i>	1024-1026, 2074, 2085	28.1.2.12	<i>Unity attributes to success</i>	2064, 2082	
28.1.1.13	<i>Positively</i>	1036, 2045, 2051, 2062, 2065, 2068, 2071	28.1.2.13	<i>it is important to accept others personal differences</i>	2086	
28.1.1.14	<i>Respect others</i>	1044				
28.1.1.15	<i>Sharing information builds a nation.</i>	2072				

Feedback about reinforcement of personal values given in Table 5.99 had the same frequency for *Did not* as as during Visit 2. The personal values that were reinforced, according to students, reflect both personal and social affirmation. Personal affirmation consisted of increased self-confidence, perseverance and character building. Social affirmation was a result of mutual respect and teamwork.

During Visit 2 there had been no feedback of *No effect* for personal beliefs, as had been the case during Visit 3. In this case personal affirmation was achieved through improved self-belief, more confidence and always doing your best. Social affirmation reinforced beliefs, as did seeing the good in all people.

As with personal beliefs, there was no feedback of *No effect* during Visit 2, in contrast to Visit 3. Reinforced convictions due to personal affirmation was a result of improved self-confidence. Reinforced convictions due to social affirmation was a product of students feeling that the community benefited.

Personal values, beliefs and convictions were thus reinforced by the exercise, indicating personal growth as well as elements of social responsiveness. This correlates with a positive response in relation to exposure to circumstances and communities students did not know (Prinsloo *et al.* 2006:97).

5.8.28.1 Reflection discussion

The minimal feedback for this theme in the rubrics can be an indication of what students referred to as, *It was an in between experience*, during the interviews. The group continued,

We felt kind of we gave something for the community we felt positive about that. It was not a warm feeling like you've did something amazing you are glad that you helped. We had a better understanding of the community so that we can communicate better with them.

Though this group did not believe their values, beliefs and convictions had been reinforced, students will be more responsive to the community.

Most of the feedback from students during the interviews indicated that values, beliefs and convictions had been reinforced: *This opportunity allowed us to spread knowledge to those children in St Bernards; We helped people. When we left the school we had a warm fuzzy feeling. We were proud of ourselves because we saw it affected the community; Yes, if you know something that someone doesn't know and you can contribute to their life with sharing the knowledge it makes you feel good and that's what we did. Respect; Got another chance to give back to the community and helping people felt nice.*

5.8.29 Theme 29

Students were asked to respond to the question, *How did this situation challenge values, beliefs and convictions?* Table 5.100 contains three information sets, namely, personal values, beliefs and convictions.

TABLE 5.100: STUDENTS' FEEDBACK ABOUT CHALLENGES ASSOCIATED WITH PERSONAL VALUES, BELIEFS AND CONVICTIONS (table continues on next page...)

29.1.1 PERSONAL VALUES			29.1.2 BELIEFS			29.1.3 CONVICTIONS		
Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.	Category No.	Categories	Rubric No.
29.1.1.1	<i>Did not</i>	1023, 1027, 1030, 1032, 1035, 1038, 1039, 1042, 1043, 2044, 2047, 2049, 2056, 2063, 2064, 2068, 2071, 2073, 2076, 2077, 2086	29.1.2.1	<i>Did not</i>	1023, 1027, 1030, 1032, 1038- 1043, 1045, 2044, 2049, 2056, 2068, 2071, 2073, 2076, 2077, 2084, 2086	29.1.3.1	<i>Did not</i>	1023, 1027, 1030, 1032, 1038- 1043, 1045, 2044, 2049, 2056, 2071- 2074, 2076, 2077, 2080, 2084
29.1.1.2	<i>Public speaking</i>	1040, 1041	29.1.2.2	<i>Believe in others</i>	1022	29.1.3.2	<i>Confidence to address others</i>	1026
29.1.1.3	<i>Social skills</i>	1026, 2083	29.1.2.3	<i>Self-belief</i>	1026, 1044, 2069	29.1.3.3	<i>Students also to help others</i>	1033
29.1.1.4	<i>More group less me</i>	1022, 2050	29.1.2.4	<i>Positively</i>	1024, 1036, 2045, 2051, 2065, 2083	29.1.3.4	<i>Believe in others</i>	1028
29.1.1.5	<i>Self-belief</i>	1024, 1033, 1044	29.1.2.5	<i>Help others</i>	1033	29.1.3.5	<i>Positively</i>	1036, 2045, 2051, 2065, 2083
29.1.1.6	<i>Positively</i>	1036, 2045, 2051, 2065	29.1.2.6	<i>More group less me</i>	1028	29.1.3.6	<i>You have to be well prepared to get a positive response from your audience</i>	2085
29.1.1.7	<i>Mutual respect</i>	1028, 1045	29.1.2.7	<i>Made me a better person</i>	2074	29.1.3.7	<i>Willing to compromise</i>	2052

29.1.1.8	<i>Confidence</i>	2046, 2052, 2069, 2072, 2074, 2085	29.1.2.8	<i>Don't need other group members</i>	2080	
29.1.1.9	<i>Inability to believe in others</i>	2070				
29.1.1.10	<i>Bad teamwork</i>	2080				

During Visit 3 there was less feedback about challenges associated with personal values, beliefs and convictions. The personal values that students perceived to have been challenged were influenced by personal critique in a societal differentiation and demand paradigm. Personal critique was revealed by students mentioning confidence and self-belief. Societal differentiation of values happened when students indicated social skills and when students had to put the group first. Societal demands required students to show mutual respect. Students responded to community needs and displayed positive change in attitudes towards the community (Prinsloo *et al.* 2006:97).

Personal beliefs were challenged due to personal critique elements, such as self-belief and students helping others. Societal differentiation that challenged students' beliefs was believing in others. This indicates the positive change in students' perception of the community, as mentioned by Prinsloo *et al.* (2006:97).

The consequences of identifying personal values, beliefs and convictions that were enhanced, and which resulted from facing challenges, were personal growth and social responsiveness.

5.8.29.1 Reflection discussion

Feedback by some group members during the interviews indicated that assumptions did not prove to be true, and additionally reflected students' social responsiveness:

I have this thing in my mind that a black community is poorer than a white community (which is not always the case) but it made me happy and it made me proud of myself to give something back to a community I think is poorer. I think giving that information we gave might make them to do something with their lives in an educational way as well.

The feedback also displays personal affirmation and personal growth.

Personal values, beliefs and convictions were reinforced, as shown by student comments such as,

We actually made a difference. We achieved something. We actually came up with new information they didn't know. They only knew that ultrasound was used to do obstetrics but we told them more about ultrasound other uses besides for pregnant ladies. Also they haven't seen the actual image that was in real time and that enlightened them and they enjoyed it.

Again, the feedback displays personal affirmation and personal growth.

One group mentioned, *It didn't challenge anything*, and this could be an indication that the experience had no or a minimal effect on them or that the third visit had a more reinforcing effect on them.

5.8.30 Theme 30

Students were asked, *Should I/they have worked with others in a different way?*

5.8.30.1 Similar categories

Similar feedback as that given for this theme for Visit 2 was provided for Visit 3; it is presented in Table 5.101.

TABLE 5.101: SIMILAR CATEGORIES MENTIONED FOR VISIT 3 FOR THEME 30

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 30.1	<i>No</i>	1022-1024, 1027-1029, 1036, 1038-1042, 1044, 2044, 2047, 2049-2051, 2053, 2054, 2056-2059, 2062-2064, 2068, 2069, 2072, 2074, 2075, 2077, 2082, 2084, 2086
Category 30.2	<i>Yes</i>	1026, 1033, 1035, 1043, 1045, 2046, 2048, 2060, 2085
Category 30.3	<i>Don't know</i>	1030
Category 30.4	<i>More interaction with learners</i>	2045
Category 30.5	<i>More interaction with group</i>	2052
Category 30.6	<i>More patient with others</i>	2070, 2076
Category 30.7	<i>Time management</i>	2061, 2071, 2080, 2083

During Visit 3 there was more diverse feedback in comparison to Visit 2. Further comments made by some of the students who answered, *Yes, I have worked with others in a different way*, were, *Not present at all discussions* (1026), *Time management* (1033), *Communication and planning* (1035), *More attention* (1043) and *Patience with scholars* (1045).

For the theme, *Should I/they have worked with others in a different way*, no different categories emerged when Visit 3 results were compared to Visit 2 results.

5.8.30.2 Reflection discussion

Similar feedback as in Section 5.8.30.1 was received during the interviews. Students commented, *No* and *No difficulty. It was an in between experience. We felt kind of we gave something for the community we felt positive about that; We had a better understanding of the community so that we can communicate better with them.*

The statement indicates improved social responsiveness and personal affirmation.

Another group indicated personal growth as a means of minimising difficulties when working with others: *We have to have more patience with the scholars that were sleeping and talking.*

Compared to the variety of feedback received for this theme during Visit 2, Visit 3 had few responses; the feedback demonstrates both personal growth and social responsiveness.

The questions of Themes 31 to 36 ask students to examine and analyse the SL experiences from the *Management* point of view.

5.8.31 Themes 31-33

Table 5.102 presents the feedback for *appropriate orientation regarding the purpose* (Theme 31) *and process* (Theme 32) *of SL*. Table 5.102 also contains student responses to the question, *Was the action appropriate to the situation* (Theme 33)?

TABLE 5.102: STUDENTS' FEEDBACK ABOUT APPROPRIATE ORIENTATION AND ACTIONS

THEME 31		THEME 32		THEME 33	
<i>Were you given appropriate orientation regarding the purpose of SL?</i>		<i>Were you given appropriate orientation regarding the SL process?</i>		<i>Was the action appropriate to the situation?</i>	
Yes	No	Yes	No	Yes	No
1022-1046, 2043-2063, 2065, 2067- 2081, 2083- 2086	2064, 2066, 2082	1022-1046, 2043-2063, 2065-2081, 2083-2086	2064, 2082	1022-1031, 1033- 1037, 1039-1045, 2043-2086	No feedback

The feedback received for the three themes confirms that students were orientated appropriately and that they believed that the action was appropriate to the situation. The student who completed rubric 1035 also mentioned *well discussed* in reference to appropriate orientation, and *What to expect ... our responsibilities* in relation to appropriate orientation of the SL process.

5.8.31.1 Reflection discussion

All five groups confirmed the reflection rubric results for *appropriate orientation regarding the purpose* (Theme 31) by saying *Yes*; they added, *We were given enough orientation*. They also believed that the repetition thereof during Visit 3 assisted their understanding: *We didn't understand it well enough the first time but now it was explained better before the next visit*.

All five groups confirm the reflection rubric results for *appropriate orientation of the SL process* (Theme 32) by saying *Yes*. Again, the value of repetition was confirmed by students saying, *We went through the process twice. Any misunderstandings we had were cleared when you had to explain to the schools you presented to and then it was explained again*.

For the theme, *Was the action appropriate to the situation* (Theme 33)?, all five groups said *Yes* and continued, *Definitely. It was the cherry on top of the cake*. Another group added, *it hits the mark. The Grade 12 learners did not know much. Learners would rather listen to their peers than a teacher*. Another group said, *Yes. Everything went according to plan*.

5.8.32 Theme 34

Students had to answer the question, *Do you think the SL intervention addressed community needs as intended?*

TABLE 5.103: STUDENT RESPONSES FOR THEME 34

CATEGORY 34.1 YES	CATEGORY 34.1 NO	CATEGORY 34.1 PARTIALLY
1022-1024, 1026-1037, 1039-1041, 1043-1045, 2043-2051, 2053-2056, 2059-2063, 2065, 2069-2074, 2077-2079, 2081, 2086	No feedback	1025, 1038, 1046, 2052, 2057, 2058, 2064, 2066-2068, 2075, 2076, 2080, 2082, 2085

Most students reported that community needs had been addressed as intended, there was no feedback of *No* and 15 students stated that community needs had been addressed partially (cf. Table 5.103). In relation to community needs being addressed partially, the next theme asked students to clarify their answers. These will be discussed in Section

5.8.32.1 Reflection discussion

During the interviews all groups said *Yes*, the SL intervention addressed the community needs as intended. No further comments were made.

5.8.33 Theme 35

Students were asked to *Clarify your answer in the above question.*

5.8.33.1 Similar categories: YES

Similar clarifications for Visit 3 as had been given for Visit 2 will now be discussed

Categories 35.1 - 35.4

As for Visit 2, most students reported that the third visit's session was *Informative* (1022-1024, 1031, 1032-1035, 1037, 1039-1045, 2052, 2056, 2060, 2063, 2070-2072, 2074, 2076, 2079, 2081-2083), and one student (1039) added that the presentation *give the community knowledge*. Other students felt that the experience was *Educational* (2044, 2047, 2048, 2053-2055, 2065, 2069); five students stated this for Visit 2. This feedback indicates that the engagement with the Grade 12 learners went beyond that of spreading

of information. Two students (2071 and 2083) indicated that it was both *Informative* and *Educational*. The students' feedback can also be read as the students referring to the importance of what they were doing.

The category with the third-highest frequency was *Prevention and treatment* (1030, 1031, 1034-1035, 1040, 2044, 2051), which also had a high frequency during Visit 2.

The categories presented underline what one student (2078) mentioned, namely, that *the intended message was received*.

There were no additional categories presented when students had to clarify their *Yes* answers.

5.8.33.2 *Similar categories for Partially addressed*

Similar categories that emerged when students had to clarify their view that community needs had been partially addressed as intended were Category 35.5, *Not all were NS learners* (2066) and Category 35.6, *Learners did not understand everything* (2068).

5.8.33.3 *Different categories for Partially addressed*

Different categories explaining why students said *Partially addressed* will be presented in the following sections

Categories 35.7 - 35.10

Students reported that community needs had been partially addressed because the presentation had been *Only informative* (1025). Students suggested that there should have been *More CUT participation* (1038) and that the interaction *Should have been more intensive*. The last comment explains that students believed that the interaction was worthwhile but that it needed some rethinking and revamping. The student who completed rubric 2064 was of the opinion that we *May have educated female learners more*. On the other hand, another student was of the opinion that the Grade 12 learners *will not spread the message*. This statement contrasts with comments stating that *learners will spread the information* made during Visit 2, which could indicate that the third visit's outcomes needed reconsideration.

5.8.33.4 *Reflection discussion*

Students were more forthcoming during the interviews, and stated,

Definitely. They learned about new information about obstetrics we actually told them more about it and what we use like ultrasound etc. It will benefit the community because they will know if they are pregnant or not. They will be able to go and have an ultrasound. Some of the ladies we met previously didn't want to go for an ultrasound because they felt it will give you false information for example the ultrasound will tell them it's a boy and then it comes out a girl. At least I think we clarified it for them.

These comments indicate that the students believe that they addressed community needs because the community benefited from gaining health-related information and because students clarified misinformation within the public domain.

Students were able to observe Grade 12 learners' reactions to the students' presentations: *As we presented their actions said that they were interested and understood what we said and they wanted to know more.* A consequence of students' observation was that students also believed that, *They will also tell others about the new information because they were excited to learn new information. Not also in terms of telling people because they are still students they are still studying. There will be cases when learners are asked a question and all of the sudden you remember and now you know it.*

This was confirmed by other groups that said, *I think the students will inform others. They were more eager to learn about the obstetric part, they wanted to know what's happening and how it happens and Everyone took something home with them and pass it on to others.*

These statements not only contradict the statement of, *will not spread the message* mentioned in Section 5.8.33.2, but also refers to a long-term positive effect of the SL intervention.

Related to the mock examination students performed, Grade 12 learners were eager to be part of the examination: *they were very excited to be part of the experience, when we wanted volunteers to be the patient, there were four or five. They were so astonished with what they saw for the first time a real sonar image. It was a good experience.*

To students this was an indication that community needs had been addressed.

5.8.34 Theme 36

The final theme of the student reflection rubric was, *How can the relationship between the CUT and the community in relation to service-learning be improved?*

5.8.34.1 Similar categories

When compared to Visit 2's results, Visit 3 had 11 similar categories as can be seen in Table 5.104.

TABLE 5.104: SIMILAR CATEGORIES FOR THEME 36

CATEGORY NO.	CATEGORIES	RUBRIC NO.
Category 36.1	<i>Nothing</i>	1022, 1023, 1025, 2049, 2053, 2056, 2069, 2076, 2084, 2086
Category 36.2	<i>Other disciplines</i>	1030, 1044
Category 36.3	<i>More visits</i>	1027, 1028, 1031, 1034, 1035, 1040, 1042, 1043, 2043, 2044, 2046, 2050, 2051, 2058-2060, 2062, 2066-2068, 2072, 2075
Category 36.4	<i>Lower grades</i>	1027, 1039
Category 36.5	<i>Campus visit</i>	1035
Category 36.6	<i>More schools</i>	1024, 1033, 1036, 1043, 20465, 2047, 2073, 2078
Category 36.7	<i>Better planning, scheduling</i>	2048
Category 36.8	<i>Broader community, underprivileged</i>	1043
Category 36.9	<i>Explain importance of SL to community</i>	2081
Category 36.10	<i>More consultation with community</i>	2085
Category 36.11	<i>More interaction</i>	2055, 2063, 2065, 2080

The student who completed rubric 104 stated that more visits and *increasing the frequency would lead to higher impact*, which is a valid statement. However, the reader is reminded that this would have an impact on the Grade 12 schedule as well.

5.8.34.2 Different categories

Categories 36.12 - 36.21

As in Section 5.8.33.2, students suggested *More CUT involvement*, which would lead to, *a greater audience being reached* (1038). Other categories that emerged were requests for *Better communication* (1032), in reference to scheduling with the community, and

Neighbouring towns (1041), reflecting both the value of the interaction and having a broader impact. The student who completed rubric 1045 indicated that *Handouts* would not only have had a greater, lasting impact on the Grade 12 learners, but could also have a broader community impact. *Handouts* also relates to *Career guidance* (2052, 2054) and *Providing more information about the CUT* (2083). Students indicated that future engagements should address the community need relevant to the Grade 12s' future educational prospects, and, in so doing, illustrated social responsiveness. The validity of the assertion of the students' social responsiveness can be found in Section 5.4.3.3, where the Grade 12's ask for *Handouts: CUT brochures and Pamphlets*.

Social responsiveness was also demonstrated by one student stating, *More people should do SL and it should be provided to more schools* (2074) and another declaring, *Improved ability to talk in other languages* (2071). The final comment from the student who completed rubric 2071 gives an indication that this student experienced personal growth.

5.8.34.3 Reflection discussion

Feedback during one of the the student-group interviews proposed, first, *More visits*, and second, more interaction with the Grade 12 learners: *Also something we don't do is asking anyone what you have learned*, and third, *What about rural schools?*

Another group's suggestion for improving the relationship between the CUT and the community was, *Better communication with the schools. It was postponed 3 times with this group*. Students felt that the project should be expanded so that it could have a broader impact. They commented, *I think we should do it more often and with different schools. We must rotate. Need to build a relationship with them also*.

During the last interview, students hinted that CUT marketing was an essential element of improving the relationship with the community, because it gives Grade 12 learners an indication of study possibilities: *The little booklets we gave them, some of them were interested in knowing what degree and grade you have to have in physics. Give out more information regularly*.

5.9 FACILITATORS' SEMISTRUCTURED INTERVIEWS

Interviews were conducted with SL facilitators from the University of Johannesburg (UJ) and Tshwane University of Technology (TUT) and a Skype® interview was conducted with the facilitator of Cape Peninsula University of Technology (CPUT). Facilitators first had to indicate whether they are currently engaged in SL as described by Bringle and Hatchet (1996:222) and all participants indicated that this was the case.

Next, they had to indicate under which module SL falls. For UJ and CPUT it was the third-year management module. UJ's community partner was crèches in disadvantaged communities, TUT's served several community partner crèches, high schools and a primary-care clinic. CPUT involved high schools in their programme.

The rubric and discussion thus assess the following research questions (Section 1.4.3) and associated objectives:

2. To establish whether SL cultivates social responsiveness in students;
3. To investigate the effectiveness of SL in allowing students to achieve the graduate attributes; and
5. To analyse whether reciprocity is achievable when doing SL in Radiography.

5.9.1 Theme 1

The first question posed to participants, *We impose our agenda on communities; they play no role in establishing outcomes (true or false)*, enquired about community participation in establishing goals.

5.9.1.1 Institution 1

The feedback from institution 1 reads as follows: *They are establishing goals in collaboration with the community, so the community does have a voice, we were not imposing.* Students had to identify the need and set goals; the facilitator only guided the process.

5.9.1.2 Institution 2

No consultation with the community but consultation with the students because we only started at the end of April and finished the end of October so we were pressed for time. Students acted as agents, it was also the first time.

This feedback from institution 2 shows that students were sent into communities to do a needs analysis, but no formal consultation took place between the institution and the community beforehand. Students drove the process and the facilitators guided them.

The ideas came from the students, we helped with the outcomes. They compiled it and they presented it to the lectures. The students saw the need in the community and we assist them with it and also looked at the ethical part.

It is not clear whether the community played a part in creating the outcomes that addressed the need identified by students.

5.9.1.3 Institution 3

The SL rollout *is different every year* for institution 3. *Students go out and do a needs establishment and get some outcomes. The community does have a say in what they need.* In this case clear mention is made of community participation in the needs assessment and the outcomes to address these needs. Further, *Communities do a reflection, but no marks are given.* This allows for evaluation of the effectiveness of interventions and also helps to strengthen relationships by allowing all participants to feel valued.

5.9.2 Theme 2

The second question asked during the interviews aimed to determine whether *Communities benefit from Radiography SL.* The question received a positive response from all participants.

5.9.2.1 Institution 1

It does benefit the community, was the first response from the facilitator at institution 1. She continued by saying,

For example on Mandela day they said look we are going into this community and we are going to take the crèche ladies for the day and work with them (infection control). Sometimes they just go and play with the children at the crèche. They brought food for the old age home and baked for abandoned children... and it benefits the community for especially the child that does not feel loved. The crèches were different kinds, an ordinary crèche and another one for abandoned kids. These kids really enjoyed having them. They played for the whole day and even organised a jumping castle and it was a good day for the crèche kids.

5.9.2.2 Institution 2

The facilitators organised their response to communities benefitting from SL according to the various engagements of different year groups. In reference to the first-year SL engagement, the facilitator reported,

The little ones at the crèches enjoyed it and understood what was going to happen to them when going to the hospitals. For them it was actually a very good experience. The nursery teachers all gave back positive feedback to the students.

Communities with which the second-year students interacted also benefited, according to the facilitators:

The other two projects the second year students only made posters that went up into the government clinics regarding breast cancer. They've got very positive feedback from the clinics from the sisters and from the ladies that were just there for the day but it wasn't followed-up.

The purpose of the third-year student SL was to inform high-school learners about Radiography as a career choice:

The third years went to schools in the city area and then they presented Radiography marketing, the one aspect was the marketing of the cause and the other aspect was they had to tell why it is important to have maths, physical science and life science as a subject from Grade 10 onwards before they do a selection. They had to a presentation for the Grade 9s. The community definitely benefited from this.

5.9.2.3 Institution 3

The institution 3 facilitator believed the variety of interactions the students at this institution have with communities benefit those communities. *Yes, absolutely. Students decide on community. They work with abused children, assist in making career choices as well as the creation of a library for needy children.*

5.9.3 Theme 3

Question 3 obtained facilitators' opinions regarding *SL cultivating social responsiveness in students and change behaviour.*

5.9.3.1 Institution 1

Though the *Yes* feedback indicates that the facilitator believes that SL cultivates social responsiveness in students, her explanation does not provide enough information about her reasons for believing this—it is her opinion and the outcome has not been measured,

because the idea is also that I'm trying to install in them that once they are qualified they are working out there and that they should be responsive to the needs of community they work with. They present the videos they took so the other students can actually see what they did. Each group presented what they did for their specific Mandela. Groups tried to impress each other. All were positive.

When asked whether communities benefit from SL, the statement made in relation to abandoned children indicates that students grew, *In that way it's from them I feel it makes them grow.*

5.9.3.2 Institution 2

The facilitators from institution2 believed that SL helps to cultivate social responsibility in students. They commented,

Yes definitely. It made them aware of the need there is for education. I am thinking of the 2nd years. Just leaving the poster with information of breast cancer. It is just a poster against the wall but anyone going through the trouble reading it will learn something

every time. So the students feel that they have done something, that they have accomplished something and did something for the community.

Facilitators confessed that,

What they have also enjoyed they were keen to go off for the project instead of sitting in my class because they really enjoyed it and put so much effort in it. They specifically asked to leave class early to go to Hartebeespoortdam were the thing was. They were so excited about it and the energy that came along with it and not only the project itself but the outcome of the project.

The facilitators also mentioned that the response was universal and the activity led to improved student relations and interaction *The group dynamics were good and the reaching out.*

5.9.3.3 Institution 3

An affirmative, *Definitely, yes*, was the response from the facilitator of institution 3. She qualified her response by adding, *Absolutely, they want to go back. They create interpersonal relationships.* This benefit goes beyond cultivating social responsiveness, and also reflects a sense of solidarity with students becoming active contributors to citizenship.

5.9.4 Theme 4

The statement *SL cultivates critical thinking in students* had the following responses.

5.9.4.1 Institution 1

SL cultivates critical-thinking skills, as explained by the facilitator from institution1:

It should because I am assuming that they first go to that community and they find out what their needs are and thereafter they sit down and decide how they are going to address it. I always say you can't give them everything but they have to identify specific areas they can manage. Don't promise a lot and sit down with them and decide what they need. In doing so they have to apply critical thinking skills.

5.9.4.2 Institution 2

Most definitely, yes, were the first words from the facilitators. Their feedback agrees with their UJ counterpart, in that,

First of all they have to come up with ideas so they had sort of brainstorm around a certain project. That is critical thinking, the brainstorm process and when they compile there project using all the media going in to put the whole thing together.

They also mentioned that, *For sure it was a little bit out of the box. The way they presented it and they involved all within the group.* The last statement confirms that students being taken out of their comfort zones, they had to apply planning and cultivate good group interaction.

5.9.4.3 Institution 3

The response was, *Yes.* Because SL forms part of the management module at institution 3, project planning and management were emphasised, which warranted critical thinking and, *especially problem solving skills.*

5.9.5 Theme 5

SL is credit bearing and specific learning outcomes form part of the SL outcomes, namely, what students are supposed to achieve. Consequently it was important to find out from facilitators whether *SL allows students to achieve specific outcomes.*

5.9.5.1 Institution 1

In answering this question, the facilitator said, *Yes. I structured it in such a way it is like a project. It has pointers which they have to look at and incorporate also management skills. They need to plan and organise.*

In reference to institution 1's third-year management outcomes, students,

need to have a leader and also have some kind of control measures. So before they go out there that must in place. They go and do their project, come back and write the

report. The report is also a reflection about the project itself. How they benefit, was it worth it. Some of the questions are: Was this a necessary project? Did they benefit anything? Was it difficult? I gave them 3 questions but they that had to draw up their own questions to develop an questionnaire this is also a way to do a case study. It is like a reflection, self evaluation. I got the assignments back that I had to mark using a rubric.

5.9.5.2 Institution 2

At institution 2 all year groups participate in SL, thus the comment was, *Yes definitely. One can add that because the projects they did per year were in line with what they need to cover for the year. It is part of the curriculum.* Facilitators gave an example: *The first years had to concentrate on patient care. To explain how to work with kids, they had to demonstrate. The students said it made sense to them.* The facilitators continued that students commented, *Wow, now it actually makes sense.*

5.9.5.3 Institution 3

Here the facilitator agreed, *Yes, the SL forms part of management and they have to do investigations and apply project management skills during the SL process.*

5.9.6 Theme 6

Academic reciprocity is not always achievable when doing SL in resource-based disciplines like Radiography, but it was important to find out from other institutions what their experiences were. They were asked to respond to the statement, *Reciprocity (enhancement of the curriculum) is achievable when doing SL in Radiography.*

5.9.6.1 Institution 1

The feedback from institution 1 referred to reciprocity in relation to the development of soft skills and social responsiveness, and, to a lesser degree, reciprocity in relation to the modular outcomes.

I think so because there are 3 pillars: teaching and learning, research and community. That is the idea that enhances their knowledge and instil their responsibility to their community. As radiographers we can't go around with our X-ray machines so this is the

only way we can be responsive to the community. It does enhance the specific module. It does not change the module content. To me I'm taking it as an addition to their knowledge. It is only enhancing their knowledge and also a bit of revision. I'm teaching them to be managers. I'm instilling that notion that is managers this is how we need to be responsive to the people around you. It's not out about the X-ray department only, the X-ray department exists in a community.

The facilitator agreed with the feedback from Radiography students (cf. Section 5.8.9.1) that SL enhances the curriculum because it provides opportunities for revision.

5.9.6.2 Institution 2

The facilitators agreed with the Radiography students' feedback: *Definitely. It is like revision. It makes the picture so much clearer.* In contrast to the other institutions, but similar to Bellner and Pomery's (2005:91) explanation of student retention, the facilitator also said, *You know also it change their attitudes towards school work. That same attitude changes also boils over to colleagues. It is a positive sort of horizontal line.*

Reciprocity is also displayed by the comment, *The second years were better with patient care with mammography with the background of the posters that they have made. Being able to give the patients better information when being asked questions.* The TUT facilitators created a link between reciprocity and critical thinking: *That is also part of the critical thinking process while they were compiling they were also learning. It is a lifelong learning process.* Using SL to help students achieve outcomes also required a rethinking of the use of personnel: *Clinical tutors helped with logistics. They were very involved.*

5.9.6.3 Institution 3

The facilitator stated, *Yes, reciprocity was achieved at institution 3, through application of knowledge.* An interesting observation was that *Students also gets to see where people are from;* this may be a reference to knowing peoples' backgrounds and that it has an impact on future interactions with patients.

5.9.7 Theme 7

Facilitators from the three institutions were asked a general question in relation to graduate attributes: *Does SL allow students to achieve the graduate attributes?* The

responses are presented in Sections 5.9.7.1 - 5.9.7.3. The achievement of the individual graduate attributes was assessed, and these are presented in Table 5.106.

5.9.7.1 *Institution 1*

The facilitator at institution 1 gave an emphatic *Yes* in response to this question.

5.9.7.2 *Institution 2*

Institution 2's facilitators pointed to the context in which the graduate attributes achieved could be applied, namely, *The clinical Radiography practice. It does carry a certain amount of credits.*

5.9.7.3 *Institution 3*

The facilitator of institution 3 stated, *Yes*, SL does promote the development of graduate attributes.

5.9.8 Themes 8 - 16

The presentation of Themes 8-16 shown in Table 5.105 represents the unpacking of the graduate attributes related to the statement *SL assists students to achieve the graduate attributes.*

TABLE 5.105: FEEDBACK FROM UJ, TUT AND CPUT RELATED TO THE ACHIEVEMENT OF GRADUATE ATTRIBUTES
(table continues on next pages...)

GENERIC SKILL	INSTITUTION 1	INSTITUTION 2	INSTITUTION 3
SL assists students to identify and solve problems	<i>Yes it does</i>	<i>Yes</i>	<i>Yes</i>
SL assists students to display creative and critical thinking	<i>Yes it does</i>	<i>Yes</i>	<i>Yes</i>
SL assists students to work effectively with others in the community and educational environment.	<i>Yes it does</i>	<i>Yes</i>	<i>Yes</i>
SL assists students to manage themselves with respect to/in the	<i>Yes it does because it is structured in such a way they have regular</i>	<i>We have feedback sessions every 3 to 4 weeks. At these</i>	<i>Yes</i>

community intervention, educational environment and in a personal context.	<i>meetings and record who was there, they gave me an indication of who was coming who was late. They went through the whole razzmatazz of planning. To me it does help, it does give them the management skills that they must have dealing with projects and communities, almost like project management.</i>	<i>sessions they had to do everything, scheduling, reporting. We instructed them to have at least 3 feedbacks. The managed everything themselves. Only supervision from the lecturers.</i>	
SL assists students to communicate effectively in the community and educational environment.	<i>Yes, it does</i>	<i>Yes they had to learn to do that because they were responsible for the whole project. They had to pick up the phone and call the clinic to ask when they can come and put up the posters and they had to call the schools to find out what day the Grade 9s are available to make an appointment. The other problem is the teachers never answer their phones. They learn not only to communicate within the group but also to people outside that's got nothing to do with Radiography. How to interact with people. Respect people.</i>	<i>Yes, it does</i>
SL assists students to use science and technology effectively in the community and educational environment.	<i>Yes, it does</i>	<i>Yes definitely. The 3rd years' presentations had to show applicable examples. With the making of the mammography posters they had to get additional information. They had to get all the images. They had help from AGFA with information and images.</i>	<i>Yes it does. Students had to make posters after the assignment. The IT guys also did a talk on posters.</i>
SL assists students to acquire a high level of information literacy– additional resources.	<i>Yes it does. I think it is because they have to reflect, they have to write down what</i>	<i>Yes definitely</i>	<i>Yes, it does</i>

	<i>they represent. It's the whole 360° thing. It is needs analysis, the assessment and the reflection of the presentation afterwards. They can look at it and see what they can do different in relation to time management.</i>		
SL assists students to understanding themselves and diagnostic Radiography within the national health and social system.	<i>Yes they do. Most of them said this is an experience that they will never forget. It opened their eyes. It made us realise we can have all but there are people who have not. It is definitely worth it. They're done with the theory now do the practical things.</i>	<i>I think so. It makes you step out of your little cocoon as Radiography student and places you in a place of authority were you are able to teach someone else. They like talking with authority and teach someone else even it is basic stuff. The group as such learned a lot. Most definitely a worthwhile process. It has come to stay.</i>	<i>Yes, it does</i>

Table 5.105 shows the responses from the Radiography facilitators from UJ, TUT and CPUT about whether SL helps to develop graduate attributes. The generic-skills feedback covers all aspects of SL, including planning, creation, execution and reflection, and also illustrates how graduate attributes were applicable. The feedback of the SA facilitators resonates with the feedback from the ISETL delegates as discussed in section 4.4.7.4, but allows for richer feedback as can be seen in Table 5.105.

5.10 CONCLUSION

Chapter 5 presented, analysed, interpreted and discussed the qualitative data gathered during this study. This quantitative data included the Grade 12 and contact person feedback, which indicated that they benefited from the intervention. The feedback additionally pointed to students' mastery of the generic attribute skills. The participants were also able to give several reasons why they believe that they have benefitted, as well as suggestions to improve future visits.

The reflection rubric completed by Radiography students revealed that students did not learn anything from the community, but that the SL activities created reciprocity through,

amongst others, enhancing their knowledge through collaboration. These findings were confirmed during the reflection discussions with students after the interventions. The reflection rubric also showed that students experienced personal growth and that their social responsiveness increased due to the SL engagement. Students were also able to make suggestions on ways to improve their understanding of academic work; how to improve themselves on a personal level and improving relations with the community.

The semistructured interview with facilitators from other institutions confirmed that communities benefit from Radiography SL; SL cultivates social responsiveness and critical thinking in students; SL allows students to achieve the graduate attributes, and reciprocity is achievable when doing SL in Radiography.

In this chapter all the research questions of this study were answered:

1. Does engagement through Radiography SL facilitate the betterment of communities?
2. Does Radiography SL promote citizenship by cultivating social responsiveness in students?
3. Does the planning, preparation and interaction with the community through SL allow students to achieve the graduate attributes?
4. Does Radiography SL enhance the learning through reciprocity?

In Chapter 6, ***Pluroversitism***, the framework for SL in Radiography, will be presented and discussed. The framework has a general appeal and can consequently be used by other disciplines; the framework has a pragmatic approach and includes helpful hints and evaluation tools.

CHAPTER 6

PLUROVERSITISM

A FRAMEWORK FOR SERVICE-LEARNING IN RADIOGRAPHY

6.1 INTRODUCTION

From Chapter 2 as well as Chapters 4 and 5 it should be clear that there exists a fuzzy logic in the definition, understanding, execution and research results associated with SL. This fuzziness in rigidity warrants the applier to have a deep and broad foundation of SL and also have the ability to bend to the winds of SL's whims. In this chapter the idea of *Pluroversitism*, the idea of the open-university, made possible by tangible social networks between academic institutions and the broader society, will be discussed.

Applying a general approach to structuring the framework purposefully invites other academic fields to make use of this framework. SL does not inherently subscribe to any one given approach, but important elements, such as the philosophical basis of SL, the triadic relationships between stakeholders, goal setting, relevance, implementation and evaluation, should be included.

6.2 A FRAMEWORK FOR SL IN RADIOGRAPHY

The proposed framework for SL in the undergraduate Radiography programme in the Mungaung area is depicted in Figure 6.1. The framework follows the action-research continuum, where the flow of activities, culminating in the achievement of the goals of the intervention, is reflected on constantly. The result of these reflections influences all other phases.

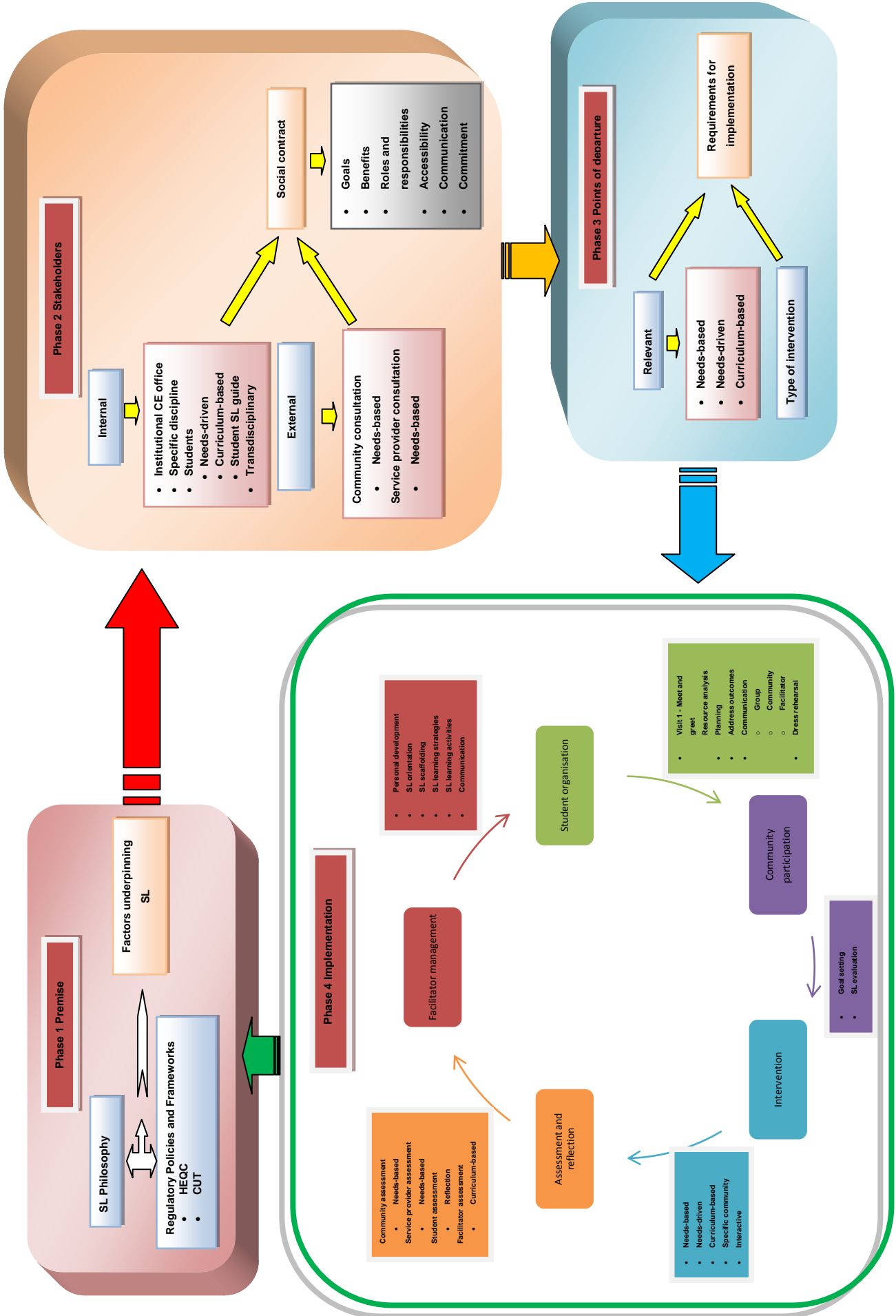


FIGURE 6.1: A FRAMEWORK FOR SL IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA (Compiled by the researcher, BOTHA 2013)

6.2.1 Phase 1: Premise

Before implementing a SL module, it is important that academics are grounded in the philosophy of SL as well as regulations associated with it.

6.2.1.1 *SL philosophy*

SL requires its applier to have a specific skill set and, most importantly, a specific mindset. Not only do we need to comprehend the philosophical basis of SL, the applier also needs to “feel” it. Those members of a community who are in more fortunate positions are obligated to help those community members who are not. The pedagogy of SL is an explicit attempt to use education as a means of promoting social justice and encouraging students to become active contributors to citizenship. This reinvention requires the institution to be susceptible to influences from its surroundings and in doing so solidarity in diversity is achieved and uni- becomes pluroversity. As Benjamin Franklin stated in 1749 (Harkavy & Hartley 2010:419), “*Ability* to serve mankind ... which *Ability* should be the great *Aim* and *End* of all learning.” From Figure 6.1 it is evident the initial philosophical stance of the applier is also influenced by the actual process of SL. The discussion of the philosophy of SL discussed in Section 2.9.6 provides but a selection of the literature that academics can use to develop their knowledge and understanding of SL.

SL philosophy should be understood and applied in the context of the environment. Though this is the case, it should always reflect Franklin’s connection between inclination and ability coupled with Dewey’s the actions of myself and strangers determine our futures. SL philosophy’s understanding evolves into the characteristics and actions associated with SL advocated for by legislation.

6.2.1.2 *Regulatory policies and frameworks*

Higher education and higher-education regulations and policies are governed by the former DoE and the current Department of Higher Education and Training (DHET), and academic institutions create their own policies and strategic plans in accordance with these regulations.

Macro level

In SA the DoE's policies govern teaching and learning at academic institutions. The incumbent SL practitioner should familiarise him/herself with CE and SL policy and directives, starting with White Paper 3 (RSA DoE 1997). This document outlines strategy to enable higher-education institutions to demonstrate their social commitment and social responsibility. Important associated documents are the HEQC *Founding document* (HEQC 2001), and HEQC *Criteria for institutional audits* (HEQC 2004a, 2004b and 2004c). Furthermore, the HEQC CHE developed *Service-Learning in the curriculum: A resource for higher education institutions* (HEQC 2006) and, in collaboration with JET, the HEQC also made available the Proceedings of the CHE-HEQC/JET-CHESP Conference on Community Engagement in Higher Education : 3-5 September 2007.

The aforementioned resources can be seen as pragmatism of SL philosophy as well as measures to attain social justice.

Meso level

Institutions each have their own SL philosophies and strategies derived from the above-mentioned documents. These philosophies and strategies are also influenced by the geographical area in which an institution is situated and by surrounding communities. A clear understanding of the institution's view on SL, the what and the how, affects strategies for and implementation of SL. Institutional SL philosophies and strategies describe the manner in which academics have to engage with the community. Activities should benefit all parties involved as well as advance institutions' social policies. These documents should not only be viewed as policy, but also as enablers since they describe institutional support, resources, funding and rewards related to SL.

6.2.1.3 Factors underpinning SL

It is essential that the philosophical and academic bases of SL be considered when an SL module is instituted. These considerations form the fertile ground necessary to drive all aspects associated with SL and, with reference to the framework (Figure 6.1), these considerations are further rejuvenated by the SL process. The revelations of this study broaden the base of SL philosophy in that it redefines philosophical concepts such as academic reciprocity in SL. Delving into the philosophy of SL allows academics to regress

to the original intent of education as presented by Franklin, and to realise anew that creation is perfect, and that imperfections due to indifference can be minimised.

6.2.2 Phase 2: Stakeholders

Next, the philosophy and regulations associated with SL should be acted on through the identification of stakeholders, both internally and externally.

6.2.2.1 *Internal*

Partnerships with internal stakeholders are not only institutionally required and managed through an institutional CE/SL office. Partnerships also increase the knowledge base regarding SL and strengthens novice SL practitioners' skill sets.

Institutional CE/SL office

CE and SL activities are usually managed through institutional CE/SL offices. The CE/SL office is also responsible for facilitating development opportunities for academics and providing access to funding for CE projects. Academics should look beyond this office's reporting function, but also recognise it as a valuable resource for promoting the SL agenda by providing support and coordinating CE/SL activities. Another important function of the CE/SL office is promoting SL activities through open days, brochures and media exposure.

Specific discipline

SL is a discipline-specific exercise and its merits as a teaching and learning method should be supported, not only by the academics directly involved, but also by their colleagues who are not directly involved. Colleagues not directly involved in SL should be invited to play a role in the establishment of the SL module through, among other activities, consultation regarding goal setting and evaluation. Having access to colleagues' expertise and, considering academics' demanding schedules, being able to rely on their assistance, is an advantage. Support from colleagues is also valuable when visit schedules change and responsibilities need to be reassigned.

Students

After appropriate orientation (cf. Section 6.2.4.1.) students become the drivers (cf. Section 6.2.4.2) of the SL project, with the facilitator taking on supervisory position (cf. Section 6.2.4.1). The students' interaction with the community is determined by the needs of the community and is thus needs-driven. The SL interaction is curriculum-based and enables students to engage with the academic work beyond the academic setting, thereby facilitating enhancement and reinforcement of knowledge.

Students represent the academic institution and have to interact with external partners. Students should know how to interact with internal and external partners and should commit themselves to the SL process and its anticipated goals as set out in the social contract. To this end students must commit to a code of conduct and close a formal agreement. Appendix Z is an example of a SL student guide given to students which includes the code of conduct, cultural competence and appropriate dress code during SL.

Transdisciplinary

Collaboration between disciplines is the next step in SL progression, but this step should not be attempted before there is an established project. During this study, both the Grade 12 learners (cf. Section 5.4.3.1) and Radiography students (cf. Sections 5.7.34.1 and 5.8.34.1) suggested a transdisciplinary approach to SL. A unified approach to SL makes it possible to achieve a more holistic positive effect on and consequently more beneficial student interaction with the community; this relates not only to the community, but also to the students. With a unified approach, students will develop a better understanding of other disciplines, and it prepares them for the world of work that they will be entering. It is important to define the relationships with other disciplines clearly; this understanding includes a common understanding of SL, as well as the purpose, goals, benefits and roles and responsibilities of the collaboration.

6.2.2.2 External

The CHESP triadic partnership model (cf. Section 2.7) developed by Lazarus (Lazarus, 2001 in HEQC 2006:93) illustrates the partnership between the community, higher education and the service provider. The students' orientation to SL is needs- and curriculum-based (cf. Section 6.2.2.1); with the need in needs-based dependent on

community and service-provider consultation.

Community consultation

In this study the needs in the community were established by using students as community agents. All three South African institutions involved in this study followed the same route (cf. Section 5.9.1). South African students exhibit diversity, and live in diverse communities; using them to gather needs-based information is advisable, but their activities should be monitored. The community should have a strong voice in identifying their own needs and the academic institution should not force its agenda on communities. The community should be an equal partner in the relationship, the relationship should be formalised (by means of a social contract) and there should regular consultation between partners.

Service-provider consultation

Experience and best practice dictate that the initial consultation with service providers should be done by a facilitator. Subsequent needs analysis can take place during lecturer-facilitated discussions with students. The triadic partnership model implies that the service provider is an equal partner in the relationship. Schedules of SL activities change constantly, influencing all concerned, consequently service providers cannot always participate in the SL activities. Assessing whether the needs of the service provider were addressed did not form part of this study.

6.2.2.3 Social contract

Initially, consultations with external partners take place individually. The result of individual consultations is to create a framework to be work shopped at a communal discussion and brainstorming session with all partners. The result of this discussion is the creation of a social contract that should include the following information.

Goals

The following questions should be asked: What are we trying to achieve? To what purpose are we doing what we are doing? The objectives of each of the partners should

be incorporated in the document and the various contributions should carry the same weight.

Benefits

The various but similar definitions of SL (cf. Section 2.9.6) state that all three partners should benefit from the SL interactions. The expected benefits for each should be noted and can also be referenced during assessment of SL.

Roles and responsibilities

Effective implementation of SL requires effective management of all activities. It is important to set out what is expected from the different partners in the relationship. A document should stipulate how partners are to interact with each other and describe processes associated with effective engagement.

Accessibility

All measures necessary to guarantee student safety should be taken. In some instances it is prudent to notify the authorities when entering certain areas. If the facilitator accompanies students, they become his/her responsibility; this also relates to travelling safely.

All parties, through the social contract, commit themselves to the success of the SL engagement. Communities should be open and receptive to students, providing students with access to resources. The environment at the site should be conducive to effective interaction, so that all parties benefit and achieve their goals. Accessibility also relates to being able to access the contact person(s) when necessary—this is why it is advisable to have more than one contact person at each SL site.

Communication

Regular, preferably documented, communication as identified during this study (students' reflective rubrics and reflective discussions) contribute to preventing most of the problems related to all processes of SL. Clear lines of communication and reporting should be followed; clear communication guidelines should be established.

Evaluation

The social contract should also stipulate the frequency and type of evaluation of the partnership and outcomes. Who is responsible for evaluation and scheduling of evaluations should be specified. Refocusing and some instances redirecting efforts ensure that all parties' needs are satisfied and rejuvenates the relationship and intervention.

6.2.3 Phase 3: Points of departure

The consulted needs of all partners enable the facilitator to establish whether the interaction is relevant to all involved. Relevance refines the discipline-specific SL philosophy and is the point of departure for meaningful and beneficial engagement.

6.2.3.1 *Relevant*

Regardless of the type of interaction students choose to reach the SL outcomes, it should be needs-based, needs-driven and curriculum-based.

Needs-based

Needs-based illustrates relevance to the community, the students and the service provider. The SL intervention should benefit all parties involved: the community gains valuable information or a valuable service is provided or skill is developed and their needs are satisfied. The students gain essential skills, attitudes and enhanced knowledge and the service provider's agenda is advanced, such as access to services, improved health or an overall improvement in the quality of life.

Needs-driven

By ensuring that interaction is needs-driven means students respond to the needs of the community and the service provider. The students' interaction and type of engagement should articulate with and satisfy the need of the community and service provider. This could be achieved through constantly reminding the students of the purpose of the intervention. These needs should be attainable within the scope and vision of the academic institution and most importantly, it should be measurable.

Curriculum-based

Unlike volunteerism (cf. 2.9.6), SL is curriculum-based, allowing for reciprocity and enhancement of the curriculum. SL is relevant to the students' academic work and, as was the case in this research sample (Grade 12 science learners), to the community.

6.2.3.2 *Type of SL intervention*

The type of SL intervention that the facilitator uses to achieve the consulted SL goals depends on the discipline-specific application of the philosophy of SL, which is moulded by legislation and institutional principles. The type of intervention is also influenced by the community's and the service provider's needs and resources. Informed, careful consideration of different methods of SL and the applicability and adaptability of each method will ensure relevance to the community and students. In context, it is important that the facilitator is convinced that every type of interaction that is used represents true SL. Four different models of SL were identified in Section 2.9.6, and in the opinion of the researcher, the first model, pure SL (volunteerism) is not SL because it does not involve an academic component. As indicated in Section 2.9.6 a hybrid of discipline-based SL, problem-based SL and undergraduate community-based action research seems to be a more feasible alternative.

6.2.3.3 *Requirements for implementation*

After going through the above activities, the facilitator should, at this stage, have an understanding of the complexities associated with implementing an SL module. The success of the SL module depends on thorough preparation and adherence to the requirements for implementation. Throughout the implementation of SL the checklist created by Kruger (2013:179) for her PhD study is a valuable resource (Appendix AA) to ensure that the facilitator is on the track.

6.2.4 Phase 4: Implementation

The following prescriptions apply during SL implementation:

- SL initiatives should address the needs of and benefit all parties involved: students (and academic institution), the community and the service provider;

- SL initiatives should provide students with an understanding of the current health needs and challenges facing communities;
- SL initiatives should develop health professionals who are prepared to deliver optimal healthcare in an environment that inherently provides unequal access to healthcare;
- SL initiatives should instil a sense of social responsibility in students;
- SL initiatives should offer students the opportunity to achieve learning outcomes in a non-traditional teaching environment;
- SL initiatives should ensure that students get the opportunity to apply their theoretical knowledge;
- SL initiatives should equip students with competencies and skills that they might not have acquired otherwise, such as communication skills, teamwork, and other generic attribute skills;
- SL initiatives should expose students to a variety of cultural, ethnic and religious groups, so that they can develop the skills and attitudes necessary to function as professionals; and
- SL initiatives should offer students the opportunity to collaborate with members from other disciplines, which will help them to find their role in an holistic approach to healthcare (adapted from Kruger 2013:165).

Figure 6.2 explains phase four of the framework presented in Figure 6.1; Figure 6.2 shows the continuum of implementing an SL module on the next page.

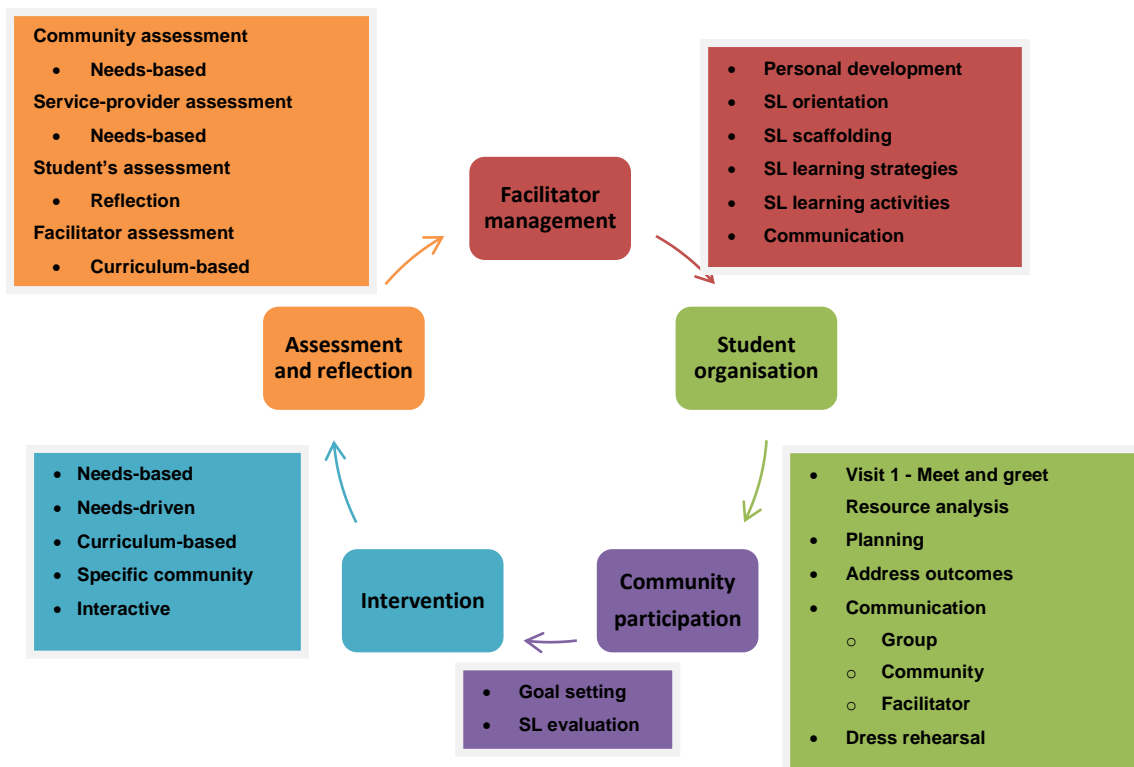


FIGURE 6.2: THE CONTINUUM OF SL IMPLEMENTATION (COMPILED BY THE RESEARCHER, BOTHA 2013)

6.2.4.1 *Facilitator management*

After the initial steps of consultation and the steps discussed below, the facilitator's role involves more oversight than it does management.

Personal development

It is the facilitator's responsibility to improve his/her understanding of SL philosophy, the pedagogical basis of SL and important aspects and characteristics of SL. This improved understanding is facilitated by self-discovery through literature searches, collaboration with facilitators involved in SL and the previously mentioned institutional CE/SL office. Practical experiences associated with the SL process itself also contribute to personal development of the facilitator regarding SL.

SL orientation

From the results (cf. Sections 5.7.31 & 5.8.31) of the structured reflection used during this study, the importance of appropriate orientation became evident. Students need to understand what they will be doing and why they will be doing what they will be doing. It is the responsibility of the facilitator to orientate students to the purpose and

implementation of the SL interaction and the benefits expected for all involved. Students should also be oriented regarding the community in which they will be doing SL; the purpose of this orientation is to dismiss assumptions, to create social empathy and establish a feeling of security in the students.

The following aspects should be addressed during orientation:

- a) Introducing and discussing the principles of SL;
- b) Discussing the purpose of SL;
- c) Explaining the partnerships involved;
- d) Providing students with background to the communities they will visit;
- e) Providing students with locations and clear directions to community settings;
- f) Preparing students for what to expect during SL;
- g) Informing students of the health and social needs of the community, which had been obtained through consultation;
- h) Informing students of the needs of the service provider which had been obtained through consultation;
- i) Orienting students to the SL module outcomes;
- j) Discussing specific activities students have to perform during SL to reach all the stakeholder outcomes;
- k) Informing students of assessment opportunities, methods and criteria;
- l) Informing students of the roles and responsibilities related to SL;
- m) Discussing professional behaviour and ethical issues relating to difficult situations that could arise with students;
- n) Addressing record keeping, supervision, accountability and problem-solving procedures;
- o) Discussing student reflections and prescribing the frequency, format and aspects that must be covered; and
- p) Advising students about support services, such as facilitator support, IT support, transport and counselling services available on campus (Adapted from ASLER standards in Duckenfield & Swanson 1992:5).

In addition to discussing the aforementioned topics during orientation in class, student handbooks or guides to SL should also be provided. An example of a student handbook or guide is presented in Appendix Z.

SL scaffolding

Students need guidance in the implementation of SL activities (see Section 6.2.4.1). Depending on the needs for and approach to SL that had been established, the implementation can take different forms. What is important is that the activities should provide easy direction and should incorporate learning strategies (Section 6.2.4.1).

SL learning theories and instructional strategies

Depending on the community needs that had been determined, the type of intervention and SL implementation, several teaching and learning strategies or learning theories can be incorporated in the SL activities by the facilitator. Learning strategies range from behaviourism, constructivism and cognitivism to conceptual and collaborative learning, including problem-based learning and e-learning. The application of these approaches should be selective and appropriate and should lead to transformative learning. The strategies employed echo knowledge construction (epistemology) and associated metacognitive activities. Strategies used during SL should serve a specific purpose, should allow different levels of development and should address different aspects of development. The purpose of the theories and strategies used is to ultimately create a professional that could adapt to his/her working environment and also shape the working environment.

SL learning activities

Because of the different approaches that could be employed and the different needs of stakeholders, there is no single recipe for scaffolding of learning activities associated with SL. The rollout of activities used during this study incorporated Activity 1 (orientation–facilitator), Visit 1 (meet and greet the community), Activity 2 (preparation–students), Activity 3 (execution–students: Visit 2, Presentation 1), Activity 4 (reflective practice–students and facilitator), Activity 5 (preparation–students), Activity 6 (execution–students: Visit 3, Presentation 2) and, finally, Activity 7 (final reflective practice–students and facilitator).

Communication

Communication includes group communication and communication with the community. This research study has illustrated the value of regular communication to improve future visits (cf. Sections 5.4.3 & 5.5.3) and to minimise difficulties and improve the relationships among the group members (cf. Sections 5.7.18 & 5.8.18) and the community (cf. Sections 5.7.19 & 5.8.19). The facilitator must ensure that regular communication takes place between the students and contact person. The facilitator should also monitor the communication according to the guidelines set out in the social contract. Different forms of communication such as face-to-face communication, SMS's, online learning platforms and social media can be used. It is also important that conflict solving should be addressed, this includes conflict solving procedures.

6.2.4.2 Student organisation

Visit One: Meet and greet

The first visit involved a "meet and greet" to introduce the students to their contact persons and service providers and to discuss matters referred to in Sections 6.2.2.3 and 6.2.2.4. If a partnership and social contract with the community already exists, the previous year's intervention should be discussed and evaluated; in this way relevance is maintained and issues arising from the previous year's engagement could be addressed. During Visit 1 the planned intervention should be discussed and a needs (resource) analysis should be done. An essential aspect of Visit 1 is to correlate the SL time frames with the community's calendar.

If no partnership and social contract exists, SL philosophy, institutional strategies and the purpose should be discussed with the identified community. Needs should be identified and outcomes formulated; it can thus be said that the SL intervention is at the second phase as described in section 6.2.2.2.

Planning

A group approach to SL is advisable because it facilitates collaborative learning and delegation of responsibilities. Student group activities include discussing the type of intervention that will address all the outcomes, setting up time frames, establishing

resource requirements and making suggestions for addressing shortcomings. These discussions are assisted through the use of a mind maps indicating the different elements contributing to the final product. It is the facilitators' responsibility to monitor and evaluate student interactions and to ensure that the community contact person is updated on the process regularly. Students have to formalise the appointments (dates and times), and provide feedback on resources.

Address outcomes

Students decide how they will address the given SL outcomes; flexibility should be allowed with minimal, if any, prescriptions. Whether students do a presentation, a drama or small-group discussions with community members, it is essential that the intervention relates to the needs expressed, and benefits all, as outlined in the social contract.

Communication

The positive effect of regular communication among group members and with the community was discussed in Section 6.2.4.1. Communication and providing regular updates are the responsibility of the students and, as discussed, the facilitator's role is that of monitoring and evaluation. Communication with contact persons should preferably be verbal (e.g. by telephone) and, to a lesser extent, emails, short message services (SMS) and social media could be used. The last mentioned can be used when students communicate with peers and the facilitator.

Dress rehearsal

Before the community is exposed to the intervention the students have created, it is essential that a dress rehearsal takes place, so that the facilitator can make suggestions for improving the intervention through constructive criticism and other inputs.

6.2.4.3 *Community and service-provider participation*

As mentioned above, the triadic relationship should be formalised by the creation of a social contract that includes goal setting. Since SL aims to satisfy the needs of a specific community and service provider, it is essential that these parties also evaluate the relevance and effectiveness of the intervention for addressing their needs.

6.2.4.4 *Intervention*

The intervention is the responsibility of the students, but in the case of institutional rules, certain logistical issues such as transport and removal of institutional property from campus (e.g. IT equipment) should be addressed by the facilitator. Vital aspects to be included in the intervention are described in the next sections.

Needs-based

The intervention and type of intervention is defined by the needs of the community and the service provider.

Needs-driven

The intervention should thus provide a response to the needs of the community, the service provider and students.

Curriculum-based

The intervention should be linked to the academic coursework through clear, unambiguous learning outcomes. These learning outcomes can be derived from other modules, with the credits coming from one specific module. It is imperative that the learning outcomes articulate with the outcomes and goals in the social contract. As indicated, these goals are negotiated on the basis of the needs identified by the community and service provider.

Specific community

The influence the specific community has on the intervention should be considered. In this study, Grade 12 learners served as the community, and this generation has specific needs and expectations and are stimulated in a particular way. For instance, in this study, students indicated how future encounters can be improved through the use of visual aids, props and more interaction. This may not be the case for a more mature community and attention needs to be paid to community selection where the initial visit forms the basis for all future interventions.

Interactive

Depending on the specific community, interaction in the form of discussion, instead of formal presentations, can be applied. Interaction can also take on other forms, such as question-and-answer sessions, games and inviting audience members to assist with the presentation. The community and students in this study suggested that greater interaction would improve future visits.

Giving students freedom to achieve the goals of the project in whichever way they wish not only encourages creativity, but also allows them to have fun.

6.2.4.5 *Assessment and reflection*

Community assessment

During the intervention, community members get the opportunity to assess the intervention using rubrics or tick lists. These assessment tools should be concise, simple, reliable, valid and relevant. Incorporating one or two open-ended questions allow community members to give their opinions on how they have benefitted and what could be done to improve future visits. Associated assessment of the value of the intervention and the development of critical-thinking skills and graduate attributes can form part of the assessment, but essentially it is a needs-based evaluation. It is vital that the facilitator explains the use of the tool to community members to avoid confusion and miscommunication.

A good idea is to ask the contact person (in this study, a teacher) to take part in the assessment as well. The teacher assessment tool should be similar to, but more informative than, the tools used by the other community members. By co-opting the contact person it would be possible to obtain a more holistic view of the effectiveness of the intervention for addressing community needs.

Service-provider assessment

The extent to which the service provider's needs were met should also be assessed. During the intervention, the service provider assesses the intervention using rubrics or tick lists. As with the community evaluation, these assessment tools should be concise,

simple, reliable, valid and relevant, and open-ended questions would enable the service providers to give their opinion on how they have benefitted and what could be done to improve future visits. This is a needs-based assessment and, to avoid problems associated with confusion and miscommunication, the facilitator should explain the use of the tool before application.

The assessment tools referred to in 6.2.4.5. are not only used to allocate marks but, through the open-ended questions, it also serves as an immediate reflection on the intervention. To ensure validity and reliability, these tools should be analysed in conjunction with academic colleagues, and even inputs from community members and the service provider.

Students' assessment

Many authors have singled out reflection as an integral part of the SL activity, because introspection enables students to gain a better understanding of the academic work, to develop social responsibility and to experience personal growth. Proven structured reflection rubrics adapted from Zlotkowski (in HEQC 2006:74) and Laplante (2007:231) were completed by students after each intervention. Substantive responses should be required to the questions posed. In addition to requiring students to complete reflection rubrics, group sessions should be held to debrief students through reflection and discussion, to clarify and confirm student experiences. Regardless of the tool used for reflection, it is important to keep the following guidelines in mind (cf. Section 2.9.1):

- Wellington and Austin's (1996:307-316) five orientations for reflective practice;
- Hatcher and Bringle's (1997:Online) criteria for producing effective reflection; and
- Mezirow's transformational Service-Learning Process Model (Kiely 2005:8).

The merit of reflection during SL is that it allows for repositioning in relation to future encounters with the community. Reflection after SL provides an opportunity to consolidate learning, to examine students' understanding and to identify new problems.

One of the objectives of this study was to evaluate whether SL improved students' critical-thinking skills. This objective may not be achieved by all SL projects, but if the need arises to do this, the Watson-Glaser Critical Thinking Appraisal tool (Appendix T) or the California Critical Thinking Disposition Inventory can be used.

Facilitator assessment

The facilitator assesses whether the students were able to achieve the curriculum-based outcomes and to what extent it happened. Problems and concepts that students experience difficulty with can be addressed to improve students' own knowledge creation.

The information provided by the rubrics and discussions with various partners enables evaluation and repositioning in reference to the goals set out in the social contract. This feedback influences implementation aspects, such as facilitator management, student organisation, community participation and the format of the intervention. As can be deduced from Figure 6.1, the SL process itself influences SL philosophy, regulatory policies and frameworks, and flows over to all the other phases of this framework.

6.2.4.6 Possible pitfalls

During all the activities associated with implementing, conducting and evaluating SL, there are matters that could have a negative effect on students' experiences. Examples of pitfalls that emanated from this study are discussed below.

Orientation

Feedback from students during this study emphasises the significance of proper orientation regarding the purpose, partners, process and outcomes of SL. Students need to be informed about the community and SL site location before they enter the communities. Using a student handbook or guide is recommended as an aid to orientation and as a reference for students.

Organisation

Feedback from the student reflection rubrics (cf. Sections 5.7.18 & 5.8.18) showed that the absence of time management and organisation skills among students had a negative impact on their experiences. Students need guidance and direction by means of open discussion and the SL student handbook. These guidelines should include information on roles and responsibilities, time scheduling and clear rules pertaining to reporting. Clear SL outcomes, activities and targets that match the learning opportunities are important prerequisites when developing an SL module.

In the reflection rubrics students suggested that group organisation could be improved if group members,

- Trusted and respected each other;
- Tolerated diversity (ethnic, cultural, religious, socioeconomic and cognitive ability) within the group;
- Motivated each other within the group;
- Improved teamwork;
- Selected a leader;
- Set out roles and responsibilities;
- Made mind maps of the way forward;
- Improved group communication;
- Conducted collaborative research; and
- Rehearsed properly.

Communication

Regular communication between all role players is important to keep all parties updated on the process and progress. Regular communication with contact persons in reference to, for example, scheduling, is critical. The facilitator should monitor communication between students and external stakeholders. Students reported during this study that better communication among group members would have reduced organisational problems.

Resources

After deciding on the specific intervention that would address all the outcomes of the module, as indicated in Section 6.2.4.2, a needs analysis of resources should be done by students during Visit 1. Resources not available for the specific intervention, such as audio-visual equipment, have to be supplied by the academic programme involved. In some instances it would also be necessary to use the human resources available at the academic institution, such as IT support and training, and the services of the graphic design department for the design and creation of posters and/or brochures. Human resources also include consultation with the institutional SL office.

SL-appropriate environment

The SL environment has to be appropriate for the intervention; it should be accessible to students, friendly and safe and should accommodate the number of students participating in the engagement. The suitability of the venue at the community site of the intervention should be investigated during Visit 1. This investigation should ensure that there would be no disturbances related to the booking of the venue, movement of other community members in and around the venue and, in the case of schools, disturbances from intercom systems.

Language

A language barrier between some of the students and members of the community can have an adverse effect on communication. Most of the SL difficulties associated with language differences can be minimised during community selection—in the case of this study, which involved high-school teachers and Grade 12 learners. Another approach would be to encourage the use of different languages during SL, were appropriate and feasible. The use of graphics, posters and brochures could also assist in addressing language problems.

Transport

It is advisable to use the transport system of the academic institution. It is also advisable that the facilitator or supervisor makes the transport arrangements in conjunction with the students and that he/she accompanies students during the interventions. The facilitator's presence would help with record keeping, such as attendance, and also with evaluation and assessment of the intervention.

Reflection

Care should be taken when doing reflection to apply the guidelines of reflection as discussed in Section 2.9.1. Reflection should encompass all the different spheres of the SL experience: academic, personal, interpersonal and organisational. Students should be oriented to the purpose, the guidelines and the reflection instrument itself. It is of great value to pilot the reflection instrument amongst students to make it more effective and to minimise ambiguity. Reflection should take place as soon as possible after each intervention. Reflection discussion adds value to the feedback from the reflection

instrument and provides students with the freedom to verbally articulate their experiences in a non-threatening environment. Discussing experiences with peers assists in putting the experience into perspective, because multiple perspectives create a better understanding of the SL experience.

Rescheduling

Rescheduling is not really a pitfall, but if students are prepared for the intervention and the community's schedule changes, it can have a negative effect on students' inclination to serve. Students participating in this study also experienced it as the community not caring and not being committed.

Student morale

A lack of cooperation between group members, rescheduling, challenges during preparation, the labour intensity of the interventions and frequency of the visits are some of the factors that can lead to a decrease in student morale. It is the facilitator's job to constantly remind students of the purpose of the intervention, to encourage and motivate students through regular communication. An important precautionary measure that facilitators can use is to deliberately be vague about the type of interaction to address community needs and thereby create ownership of the project. Care should be taken that this step does not have the opposite effect.

6.3 CONCLUSION

As stated in the introduction of this chapter, a general approach was used to create the framework for SL in Radiography. This approach enables other academic fields to make use of this framework too. The framework has an action-research approach in that there is constant evaluation and reflection on ideas and actions, because every phase influences the next and ultimately the idea of SL. The framework addresses aspects such as the philosophical basis of SL, the triadic relationships between stakeholders, goal setting, relevance, implementation and evaluation. Experiences and feedback from the various participants of this study add value to information found in literature and also allows for troubleshooting advice on possible pitfalls.

In the final chapter of this work, *Oribus Onum*, conclusions from the findings of this study are presented. The last chapter also includes discussions on the validity, reliability,

credibility, transferability, significance and generalisability of the study results and conclusions, the limitations of the study and recommendations for future studies on SL.

CHAPTER 7

ORIBUS ONUM

(One world, the idea of spiritual globalisation)

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In this research study, conclusions are drawn from the discussions of quantitative data and qualitative data of Chapters 4 and 5 respectively. Chapter 4 presented the results, interpretation and discussion of the Grade 12 learners' rubrics, contact person rubrics, facilitator rubrics, the Watson-Glaser Critical Thinking Appraisal tool and feedback from the delegates' rubrics at the 42nd ISELT international conference. The results, interpretation and discussion of the qualitative data in Chapter 5 included the Grade 12 and contact person rubrics, the students' reflective rubrics and discussions and the semi-structured interviews with Radiography facilitators at other South African institutions.

Chapter 7 will present an overview of the study; this will be followed by conclusions from the different research tools used during the study. Also discussed in this chapter are the issues related to validity, reliability and credibility of this study. A discussion of the limitations of the study will lead to recommendations, thereby completing the research circle.

7.2 OVERVIEW OF THE STUDY

The overall goal of the study was to develop a philosophy and methodology for SL in Radiography. The aim of this study was to use an evaluation of the efficiency of SL as a learning-facilitation method to develop a framework for SL in Radiography. Consequently the study endeavoured to answer the following research questions:

1. Does engagement through Radiography SL facilitate the betterment of communities?
2. Does Radiography SL promote citizenship by cultivating social responsiveness in students?
3. Does planning, preparation and interaction with the community through SL enable students to develop generic attributes?

4. Does Radiography SL enhance learning through reciprocity?

A mixed method approach was used to address the research questions. Mixing the data sets mentioned in Section 7.1 through merging, connecting and embedding were be done in reference to the objectives of the study. Information from the different tools were be used to address the following objectives of the study:

1. To establish whether the community benefits from Radiography SL.
Tools: Grade 12 learner and contact person rubrics, ISELT rubrics and semi-structured interviews with Radiography facilitators
2. To establish whether SL cultivates social responsiveness in students.
Tools: Student reflective rubrics and discussions, the semi-structured interviews with Radiography facilitators at other South African institutions, rubrics of delegates at the 42nd ISELT conference
3. To investigate the effectiveness of SL in encouraging students to achieve generic attributes.
Tools: Grade 12 learner rubrics, contact person rubrics, feedback from the rubrics of the delegates at the 42nd ISELT conference and semi-structured interviews with Radiography facilitators at other South African institutions
4. In particular, to establish whether SL cultivates critical thinking in students.
Tools: Watson-Glaser Critical Thinking Appraisal tool, the semi-structured interviews with Radiography facilitators from other South African institutions, the rubrics of the delegates at the 42nd ISELT conference
5. To analyse whether reciprocity is achievable when conducting SL in Radiography.
Tools: Student reflective rubrics and discussions, the semi-structured interviews with Radiography facilitators at other South African institutions, the rubrics of the delegates at the 42nd ISELT conference

In Section 7.3 the conclusions per objective for the different instruments will be discussed.

7.3 CONCLUSIONS FROM RESEARCH TOOLS

The conclusions from Chapters 4 and 5 will be merged, connected and embedded in Sections 7.3.1 to 7.3.5.

7.3.1 To establish whether the community benefits from Radiography SL

Ninety-six percent of Grade 12 learners indicated that they benefitted from the SL intervention (cf. Section 4.4.2.3). Grade 12 learners benefitted because content knowledge was useful and informative and was delivered at a level that they could understand (cf. Sections 4.4.3.1 & 4.4.2.2). The community was empowered, because Grade 12 learners would spread the information received (cf. Section 5.4.1.3).

Grade 12 learners' explanations for believing that they *benefitted from this experience* ranged from the manner in which the presentations were done (students' abilities/generic attributes) (cf. Sections 5.4.1.3.6), the value of the information presented and the relevance of the information to their academic work and daily lives (cf. Sections 5.5.1.2 & 5.5.1.3).

Grade 12 learners' explanations for believing that they *Have not benefitted from this experience* mainly centred on non-science learners failing to understand the content—this response means more explanation is required. Non-science and some male learners felt that the session was not relevant to them. Taken in combination with the previous statement, these responses could indicate that more consultation with all partners is necessary when establishing learning outcomes linked to community interactions (cf. Sections 5.4.2 & 5.5.2).

Grade 12 learners' suggestions in response to the question, *How can we improve future visits?* suggest that, although students demonstrate the generic attributes, there are still areas that need attention. Learners' requests for props and graphics not only indicate that they would welcome greater creativity from students, but also indicates learners' preference for learning visually. Encouraging suggestions for improvement, such as *More visits*, *More schools*, *More info*, and *More time*, not only indicate Grade 12 learners' appreciation, but also declare that they perceive these type of interactions as beneficial. In this regard the benefits extend to the broader community, thus indicating a socially responsive dimension in the thinking of the Grade 12 learners (cf. Sections 5.4.3 & 5.5.3).

All the contact persons indicated that they and the Grade 12 learners benefitted from the SL intervention (cf. Section 4.4.4.4). In the same way as the Grade 12 learners, contact persons benefitted because content knowledge was useful and delivered at a level that they could understand (cf. Section 4.4.5.3). The community would be empowered because Grade 12 learners would spread the information they had received (cf. Section 4.4.5.3).

Five delegates attending the 42nd ISELT conference 2012 confirmed that communities benefit from SL (cf. Section 4.4.8). In the same way, the facilitators from UJ, TUT and CPUT strongly agreed that communities benefit from Radiography SL (cf. Section 5.9.2).

In this study different community members (Grade 12's and contact persons) agree and confirm that SL benefits the community. The feedback from different SA facilitators confirms that the phenomena is not regional, where the feedback from the international conference illustrates that the effectiveness of SL to achieve community beneficitation does not depend on setting or context.

7.3.2 To establish whether SL cultivates social responsiveness in students

From students' reflective comments, such as *giving back to the community* and *helping others* it can be concluded that students became more socially responsive (cf. Section 5.7.15.2) during the process of SL. The same conclusion can be made from the suggestions students made to *minimise such difficulties with the community* (cf. Sections 5.7.19 & 5.8.19). One student mentioned personal growth as a reason why he/she had a positive experience (cf. Section 5.8.15.1).

Students' experiences during the Visit 2 helped to improve the manner in which they interacted with the community (cf. Section 5.8.21). Students' experiences, introspection and improvement can be positive points of reference for handling future interactions with the community. SL engagement improved students' social skills such as leadership skills, social problem solving and cultural competence (Celio, Durlak, and Dymnicki 2011:170). Cultural competent health-care workers are able to examine and effectively communicate with a diverse patient population.

An increase in social responsiveness also resulted from students being able to identify strengths and weaknesses when interacting with others (cf. Sections 5.7.22, 5.7.25, 5.8.22 & 5.8.25). Strengths mentioned were factors that enhanced both the presentation itself and factors that ensured good interaction with others (cf. Sections 5.7.22 & 5.8.22). Most of the weaknesses mentioned can be associated with social cohesion (cf. Sections 5.7.25 & 5.8.25). Students were able to suggest how these strengths and weaknesses could be either improved or overcome (cf. Sections 5.7.24, 5.7.27, 5.8.24 & 5.8.27). Students' responses to the final question of the reflection exercise illustrated social responsiveness through their

suggestions for improving the relationship between the CUT and the community through SL (cf. Sections 5.7.34 & 5.8.34).

SL reinforced personal values, beliefs and convictions in a variety of ways, including responsiveness to the community (cf. Sections 5.7.28 & 5.8.28). Personal values and personal beliefs were reinforced through social affirmation and challenged through societal differentiation and demand (cf. Sections 5.7.28 & 5.8.28). Reinforcement of convictions was due to social affirmation, whereas community differentiation challenged convictions (cf. Sections 5.7.28 & 5.8.28).

SL challenged personal values, beliefs and convictions in a variety of ways, including responsiveness to the community (cf. Sections 5.7.29 & 5.8.29). Personal values were reinforced through social affirmation and challenged through societal differentiation and demand (cf. Sections 5.7.29 & 5.8.29). Personal beliefs were reinforced through social affirmation and challenged through societal differentiation. Reinforcement of convictions was due to social affirmation, whereas community differentiation challenged convictions (cf. Sections 5.7.29 & 5.8.29).

Facilitators from UJ, TUT and CPUT confirmed that SL cultivates social responsiveness in students (cf. Section 5.9.3). From their experiences with students participating in SL the facilitators mentioned that SL causes students to develop; students believed they contributed to the community and want to return. These conclusions echo those provided in Radiography students' reflections and discussions. All five respondents attending the 42nd ISELT conference believed that SL makes students more socially responsive and changes their behaviour towards the community for the better (cf. Section 4.4.8).

Effective SL challenges preconceived ideas of people different from students; engagement with the community caused empathy, a rediscovery of the self of which lifelong engagement was an offspring.

7.3.3 To investigate the effectiveness of SL in enabling students to achieve generic attributes

From Grade 12 learners' feedback we can conclude that SL enables students to attain generic attribute skills (cf. Sections 4.4.2.1 & 5.4.1.3). During Visits 2 and 3 (during 2012 and 2013) students worked effectively with others in the community and in the educational environment

and they managed themselves. Students used science and technology effectively, and communication was effective.

The extent to which students displayed generic attributes was clear from the feedback of *strongly agree* or *agree* given by the contact persons with reference to a question about students' possession of these skills (cf. Section 4.4.5.1). From the contact persons' assessments of the presentations it can be concluded that SL enables students to attain generic attribute skills as a result of students having to create and execute presentations (cf. Section 4.4.5.2).

It can also be concluded from the feedback of all five ISELT delegates that, based on their experiences, SL assists with the development of generic attributes in students (cf. Section 4.4.8). From a South African perspective, facilitators from institutions in other parts of the country agreed that SL enables students to achieve generic attributes (cf. Section 5.9.7). Facilitators believed that generic attributes had been achieved, because students were responsible for the entire project; they had to teach others and constantly had to reflect on their actions. Triangulation of conclusions had been achieved, since ISELT conference delegates and facilitators from other institutions confirmed the Grade 12 learners' and contact persons' feedback.

7.3.4 To establish, in particular, whether SL cultivates critical thinking in students

Conclusions drawn from the Watson-Glaser Critical Thinking Appraisal tool will be presented first, followed by conclusions from the facilitators at other institutions and the ISELT delegates.

7.3.4.1 *Watson-Glaser Critical Thinking Appraisal tool*

The collective results of 2012 and 2013 scores on all subtests of the Watson-Glaser Critical Thinking Appraisal tool increased over the study period, though not statistically significantly (cf. Section 4.4.7.2). Only one subtest during the two sampling periods showed a significant increase: the interpretation test of 2012 learners' sampling had a p value < 0.0001 (cf. Section 4.4.7.1).

For the Radiography students in this study, evaluation was the best-developed skill and it showed the second-highest increase (cf. Section 4.4.7.2). Interpretation had the second-

highest starting score and showed the greatest improvement. Deduction had the lowest starting score and the second-lowest increase (cf. Section 4.4.7.2). Assumption had the second-lowest starting score and the lowest increase (cf. Section 4.4.7.2). This result could be a consequence of the structure of discipline-specific skills encouraged by current Radiography training. Inference had the third-lowest starting score and the third-highest increase (cf. Section 4.4.7.2). SL requires students to be problem solvers; when confronted with the outcomes, student had to plan, be creative and in some instances the facilitator was amazed by their ingenuity. It can also be concluded and affirmed that critical thinking is also viewed as a developmental process, which includes lifelong learning, self-directed and continuing education (Drennan 2009: 423).

Figure 7.1 illustrates the students' critical-thinking starting scores as an indication of students' abilities before SL. The illustration demonstrates the impact of Radiography training on students' critical-thinking skills due to other forms of teaching and learning practices, such as WIL. At the base of the pyramid lies the already strongly developed Evaluation and Interpretation skills. The critical-thinking skills at the top of the pyramid are the skills that increased the least and were the least developed initially: Assumption and Deduction. It can be concluded that before the SL intervention students were already able to path the way forward in a clinical setting, and developed the ability to distinguish between strong arguments and weak arguments (Evaluation).

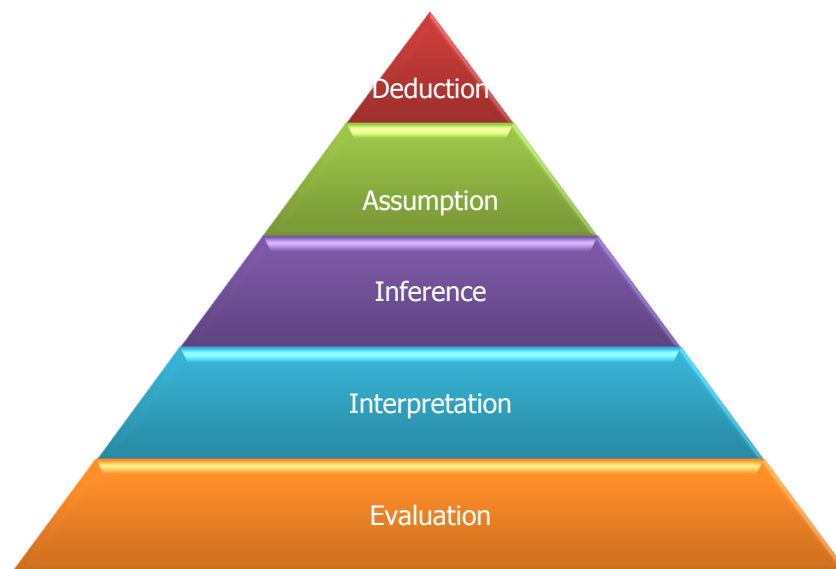


FIGURE 7.1: CRITICAL-THINKING PYRAMID BEFORE SL

Students were already able to judge whether the proposed conclusions logically followed beyond a reasonable doubt from the information given (Interpretation). Students' ability to draw correct conclusions from observed or supposed facts (Inference) and their ability to

distinguish between something presupposed or actual (Assumption) improved. Students had great difficulty considering factual statements (Evidence) with possible “therefore” conclusions and determining which are true without exception (Deduction). In relation to complex reasoning processes, such as deduction and assumption, there was good correlation between the data of Visits 2 and 3, but more experience is required to develop these skills. The improved ability of student to postulate about certain clinical outcomes in relation to the available variables is an essential evidence-based critical-thinking skill.

Figure 7.2 illustrates the students’ critical-thinking development after SL. The illustration demonstrates the impact of SL on students’ critical-thinking skills, with the biggest increase at the bottom of the development pyramid, answering the question, How did SL improve Radiography students’ critical-thinking skills?

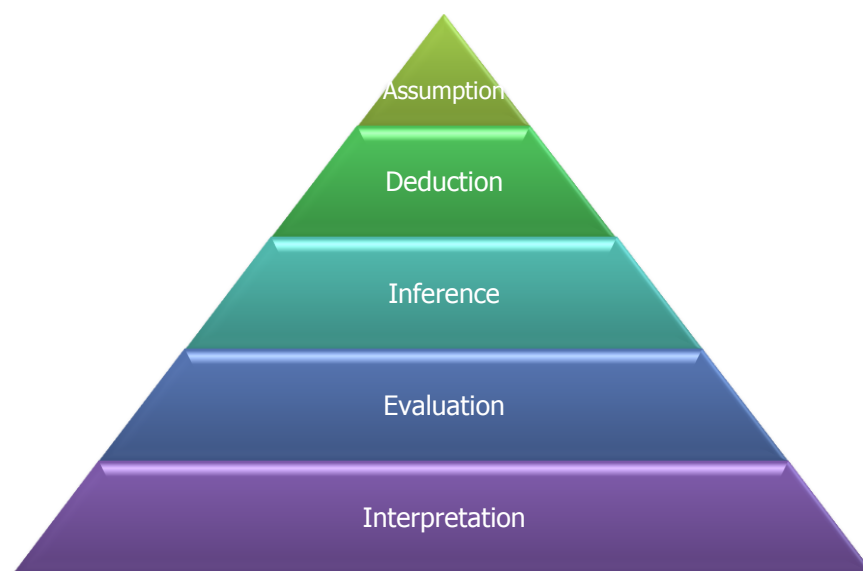


FIGURE 7.2: CRITICAL-THINKING DEVELOPMENT CONCEPT MODEL

At the base of the pyramid lies the already strongly developed Evaluation and Interpretation skills, which developed the most. The critical-thinking skills at the top of the pyramid are the skills that increased the least.

SL challenges the cognitive notion that students’ cultures determine individual development (cf. Section 2.6.1.2). The learning environment influences the development of critical thinking and SL assists in broadening the classroom and cultural impetus. Students were given a sequence of learning activities that enabled them to improve their critical-thinking skills. Therefore, students participating in SL’s learning development were affected by the particular culture in which they are emerged.

SL also involves a constructivist element (cf. Section 2.6.1.3), in terms of which students are actively trying to construct meaning and have to understand wholes as well as parts of their environment. Constructivism focuses on primary concepts and the interaction between the student and the environment; it also clarifies where students fit into the broader society. This type of learning structure works quite well for advanced knowledge acquisition encompassed by SL activities.

7.3.4.2 Other facilitators and ISELT delegates

Facilitators from UJ, TUT and CPUT confirmed that SL planning, intervention and reflection assist in developing critical-thinking skills in students (cf. Section 5.9.4). It can also be safely conclude from the ISELT delegates' feedback that SL has a positive effect on students' critical-thinking skills (cf. Section 4.4.8), because four of the five participants reported it was true and the fifth delegate said that it is probably true.

7.3.5 To analyse whether reciprocity is achievable when doing SL in Radiography

Students did not report learning academic work from the community, except for feedback from one student during Visit 2 (2013). Most students either said they learned *Nothing* or reported a non-related *Attentiveness* (cf. Sections 5.7.1.2 & 5.8.1.1). Feedback from students confirms that reciprocity in the sense of teaching and being taught did not happen, but a different type of reciprocity took place. The feedback also revealed that SL not only promotes reciprocity in reference to development of skills like communication, teamwork, the use of science and technology and the level of information literacy (cf. Sections 4.4.2.1 & 4.4.5.1), but that students' SL experience also has an academic component. It should be remembered that Bringle and Hatcher (2005:27) believe that SL does not necessarily produce academic learning though it did, but in a different form during this study. Reciprocity was made possible by incorporation of additional sources of information, through doing research and by having a practical approach to simplifying information (cf. Sections 5.7.3 & 5.8.3). Research also confirmed that the work as presented in class during the course reflected the information available and that outcomes do not need to be changed (cf. Sections 5.7.4 & 5.8.4).

Students agreed that they did not learn anything academic from the Grade 12 learners (cf. Sections 5.7.1 & 5.8.1), indicating that academic reciprocity took on a unique form in

this specific context. Academic reciprocity was achieved through enhancement, reinforcement and challenging of existing knowledge (cf. Sections 5.7.7, 5.7.8, 5.7.9, 5.7.10 & 5.8.7, 5.8.8, 5.8.9, 5.8.10). The preparation, revision and collaborative learning associated with SL enabled reciprocity. Associated with the aforementioned was student self-discovery and that fact that students had to simplify information to enable improved understanding among the Grade 12 learners and consequently also themselves.

Conclusions from the interviews with other facilitators relate reciprocity to the development of soft skills and social responsiveness and, to a lesser degree, to the module outcomes (cf. Section 5.9.5). In this instance revision, having to simplify information and having to respond to questions from the community reinforced and enhanced students' knowledge (cf. Section 5.9.6). Further, the facilitators at institution 2 created a link between reciprocity and critical thinking; students were learning while planning the intervention (cf. Section 5.9.6.2). The link mentioned can be attributed to the management module that students have to complete during their studies. This also means that, in order to address community needs, students had to reinvent the way in which they engaged with the learning material. It can also be concluded from the ISELT delegates' feedback (four of the five participants reported it was true) that reciprocity through enhancement of the curriculum is achieved when doing SL (cf. Section 4.4.8).

Since all parties involved (Radiography students and Grade 12 learners) did not function as both teacher and learner from an academic perspective and reciprocity happened between students in their groups (collaboration) and through self-discovery, reciprocity during SL needs to be redefined.

In Section 7.4 the answers to the research questions of the study will be discussed.

7.4 RESEARCH QUESTIONS ADDRESSED

The conclusions presented in Section 7.3 enabled the researcher to answer the study's research question. Unambiguous answers to the questions that gave direction are the following.

- Engagement through Radiography SL does benefit communities—conclusions presented in Section 7.3.1 serve as evidence for this finding.

- Radiography SL promotes citizenship by cultivating social responsiveness in students—conclusions presented in Section 7.3.2 attest to this finding.
- Planning, preparation and interaction with the community through SL allows students to achieve the generic attributes—conclusions presented in Section 7.3.3 is proof of this finding.
- Radiography SL enhances learning through reciprocity—conclusions presented in Section 7.3.5 serves as evidence.

The validity and reliability of the answers to the research questions will be proven in Section 7.5.

7.5 RESEARCH DESIGN

The mixed method research design used during this research project is discussed in Section 3.2.1. The mixed method approach provided more comprehensive evidence than either quantitative or qualitative approaches could provide alone (Cresswell & Plano Clark 2006:9). Merging, connecting and embedding the quantitative and qualitative data (cf. Sections 3.2.1.1-3.2.1.3 and 7.3.1-7.3.5) confirmed conclusions made from different tools; allowed for a high degree of trustworthiness through triangulation. Additionally these strategies provided a more complete picture than the data would if standing alone and through clarification of quantitative data through open-ended questions, qualitative data supported quantitative data.

7.6 VALIDITY, RELIABILITY AND CREDIBILITY

As mentioned in Section 3.7 the validity of a research instrument is the extent to which it measures what it was intended to measure and does not measure something else (Leedy & Ormrod 2010:28, 29). The results, discussions and interpretations (Chapters 4 & 5) lead to certain conclusions in reference to the study objectives possible (Section 7.3). The conclusions as stated in 7.3 made answers to the research questions in 7.4 possible. It can thus be stated that the research instruments did measure what they were supposed to measure.

Reliability is an indication of the consistency with which a measuring instrument provides a certain result (Leedy & Ormrod 2010:29). The consistency of the feedback of a large sample (Grade 12 learners, cf. Sections 4.4.2 & 4.4.3), with limited singular feedback

illustrates reliability. Using proven research instruments, such as the Watson-Glaser Critical Thinking Appraisal tool and an adapted version of Zlotkowski's reflection rubric, assists in the establishment of reliability. The results from the reflection discussions post-intervention, for which the reflection rubric was used, correlates with the results from the rubrics themselves. Similar sections from different tools provided similar results, e.g. the Grade 12 and contact person rubrics.

Credibility of the study was achieved by using methods pioneered by others (Watson-Glaser Critical Thinking Appraisal tool); through frequent debriefing sessions and triangulation by using different methods of data collection to answer the same research question. The inputs and analysis of the biostatistician, independent transcription of audio recordings and the quality control by both the research project promoter and the researcher himself additionally ensured credibility.

7.7 SIGNIFICANCE OF THE FINDINGS

From the conclusions it is clear that SL activities benefit students and communities. The results of the study not only indicated the degree to which this happens but also the value of SL as a teaching and learning method. A search of the Nexus (cf. Section 3.6.1) database revealed no SL-related studies in the field of Radiography and a RED group survey revealed that only three Radiography institutions in SA were involved in SL during 2011 (Section 3.4.4.2). The proposed framework for SL in resource-based disciplines like Radiography may assist with the planning, implementation and evaluation of meaningful academic SL engagement. The general approach to constructing the framework allows other disciplines to use the framework to establish their own SL activities.

The findings of the study created a new understanding of existing knowledge related to SL. It also led to the identification of new concerns related to students' epistemology that are worth investigating. These two revelations are both relevant to SL as practiced by a variety of academic fields, as explained in Section 7.7.

7.8 GENERALISABILITY OF THE FINDINGS

The generalisability of the previously mentioned revelations is to a large extent a consequence of the research design. Using a mixed method approach enabled a more holistic insight than using either a qualitative or quantitative approach would have. Using a variety of instruments, as was the case for measuring generic attributes, enables

researchers to apply findings to other disciplines. Similarly, using established research tools (Watson-Glaser Critical Thinking Appraisal tool) and being able to make comparisons contributed to the relevance of the study. The use of a 95% confidence interval during statistical analysis purposefully considered the applicability of the findings. The 95% confidence interval means that the results in relation to critical thinking can be generalised.

The purpose of the literature study was to, amongst others, investigate similar studies and to assist in developing the research methods used, but also to demonstrate relevance. Other disciplines will therefore also be able to use the methods used during this study; these methods include the findings and conclusions. In particular, conclusions associated with the development of generic attributes, academic reciprocity, social responsiveness and personal growth can be of value to a variety of academic fields.

7.9 LIMITATIONS OF THE STUDY

A number of variables influence all research projects and despite efforts to minimise them and their potential negative impact on a research project, some will prevail. The limitations of this study related to both the process and some of the tools used during this study. The limitations mentioned below were not major and their effects were limited, due to the use of a variety of tools to address each objective of the study.

The limitations are not presented in any order:

- The proposed framework for SL was not implemented and tested and therefore cannot be classified as a model. A model for SL would require longitudinal testing and adjustment and would not be static, but constantly evolving, influenced by community needs, the environment and the specific discipline.
- The sample sizes of other facilitators involved in SL (ISELT delegates, other South African institutions), were small, which made more rigorous statistical analysis difficult. Then again, it is important to remember that the opinions of six institutions and 10 individuals were sampled, providing at least six different SL perspectives. Also important is that the experiences of national and international faculty forms part of the sample.
- In addition to the principal, there was one contact person at each school. Sometimes, when the contact person had other commitments, no contact person was

available to assist with the evaluations. This also created challenges and made comparisons difficult.

- The difference in the return rate of the Watson-Glaser Critical Thinking Appraisal tool between Visits 2 and 3 made comparison of data difficult. Due to the skew distribution of the samples the non-parametric Mann-Whitney test had to be used to calculate significance.

The following limitations of the study tools can be identified:

- The students' reflective rubric took a long time to complete because it was very comprehensive. Although the tool was piloted, students still experienced difficulties answering some of the questions posed to them.
- The Grade 12 rubrics did not ask the learners directly whether students achieved the generic attributes. The indirect assessment of the generic attributes through the evaluation of the presentation can be seen as a limitation, but additional comments by learner, contact person and facilitator feedback assisted in the analysis of data.

In Section 7.10 recommendations to address the limitations of the study will be considered.

7.10 RECOMMENDATIONS OF THE STUDY

The recommendations below are related to the limitations and will be presented in the same order as the limitations:

- The ease of use and effectiveness of the proposed framework needs to be tested during a separate future research project.
- A bigger sample of other facilitators involved in SL would provide more generalisable results and make statistical analysis easier and more effective.
- Future studies should involve more community members as contact persons, as assessors and during reflective discussions.
- Request all students to complete the Watson-Glaser Critical Thinking Appraisal tool in class, in one sitting after both Visits 2 and 3, to thereby minimise skew distribution of the samples and facilitate calculation of significance.

The following recommendation is made to improve the study tools:

- Make the tools easier to complete by making the questions in the tool more direct and concise and using examples and synonyms in the questions that students experienced difficulties answering.

7.11 MILESTONES

Through SL the researcher had to engage with diverse strangers in sometimes unfamiliar, socio-economically differentiated environments. In the course of the study the researcher visited the communities involved 15 times per year in total; these visits included 10 dress rehearsals and 10 debriefing sessions and a great deal of travelling. Through this research project the researcher was given the opportunity to visit other institutions in SA and collaborate with academics at an international conference. Except for the last sentence this may sound like complaining, on the contrary, though the project demanded a great deal of time and effort, the researcher would answer "Yes!" to the question, posed to students during the discussions: "Does it give you that warm, fuzzy feeling inside?"

The conceptualisation, planning, proposal writing, evaluation of proposal, data collection and interrogation of data associated with this research project was always going to be life changing. The process taught me a great deal about research, about all its elements and nuances; research became a part of who I am. My horizons were broadened through using an unfamiliar research design, such as mixed method research, and unfamiliar research tools, which opened up possible new areas of investigation in the future.

The final remarks from this work was formulated during analysis of feedback of and results from the different sections of the communities.

7.12 FINAL REMARKS

The final chapter of this thesis *Orbis Unum* does not have a conclusion section as previous chapters do, since this is not

The End...

Men have been haunted by the vastness of eternity, asking how they will be remembered. The question that all of us have to answer is: What am I doing with the time given to me? Remembering that what we sow today will grow even after we have fallen. In opposition to lamenting that we live, we die and spend the years in between asking the question why we have been through what we have been.

This study has not only served to affirm the value of the teaching and learning methodology that is SL, but has also involved a process of transformation for the researcher. My understanding and perception of human nature has been transformed, my belief in the goodness of human nature has renewed and I realised anew that "everything Jah make is perfect" (Hill 1978). We, as a society, are thus obligated to adhere to the Beatitudes:

6 *Blessed are those who hunger and
 . thirst for righteousness,
 For they shall be filled.*

7 *Blessed are the merciful,
 . For they shall obtain mercy.*

8 *Blessed are the pure in heart
 . For they shall see God.*

(The Bible, Matthew 5:6-8)

How is this achievable? The starting point seems to be in the words of the word bender Shakespeare himself, in Henry VIII, Act 3, Scene 2, when Cardinal Wolsley (ironically the villainous character in the play), says to Cromwell:

"Love thyself last ..."

REFERENCES

- Alberta Learning. 2002. *Health and Life skills guide to implementation*. Alberta: Alberta learning
- Alperstein, M. 2007. Getting closer to the community voice in curriculum development: An exploration of the possibilities. *Education as Change* 11(3) Special Issue CS: 59-67.
- Bawa, A. 2003. Rethinking community-based learning in the context of globalisation. In Perold, H., Stroud, S. & Sherraden, M. (Eds.) *Service in the 21st century*.
<http://www.service-enquiry.org.za>
 Retrieved on 16 January 2012.
- Behera, D.K & Erasmus, P.A. 1999. Sustainable development of indigenous populations: Challenges ahead. *South African Journal of Ethnology* 22(1): 1-7.
- Bellner, M. & Pomery, J. (Eds.). 2005. *Service-learning: Intercommunity and interdisciplinary explorations*. Indianapolis: IUPUI Press.
- Beyer, B.K. 1987. *Practical strategies for the teaching of thinking*. Boston: Allyn & Bacon.
- Biggs, J. 2003. *Teaching for quality learning at university. What the student does*. 2nd Edition. Buckingham: Open University Press.
- Botha, R. 2009. Service learning: Experiences of first-year community engagements by radiography students of the Central University of Technology, Bloemfontein. *African Journal of Health Professions Education* Vol. 1, No. 1 December: 19.
- Botha, R. Bezuidenhout, J. & Nel, M. 2014. Developing critical thinking skills through radiography service learning. *African Journal of Health Professions Education* Vol. 6, No. 1 May: 91
- Bringle, R.G. & Hatcher, J.A. 1995. A service-learning curriculum for faculty. *Michigan Journal of Community Service-Learning* 2(1): 112-122.

- Bingle, R.G. & Hatcher, J.A. 2005. Service learning as scholarship: Why theory-based research is critical to service learning. *Acta Academica Supplementum* 3: 24-44.
- Bushberg, J.T. Seibert, J.A., Leidholdt, E.M. Jr. & Boone, J.M. 2012. *The essential physics for medical imaging*. 3rd Edition. Philadelphia; Lippincott Williams & Wilkins.
- Cameron, D., Wolvaardt, L., Van Rooyen, M., Hugo, J., Blitz, J. & Bergh, A-M. 2011. Medical student participation in community-based experiential learning: reflections from first exposure to making the diagnosis. *South African Family Practice*. 53(4): 373-379.
- Celio, I., Durlak, J. & Dymnicki, A. 2011. A meta-analysis of the impact of service-learning on students. *Journal of Experiential Education* 34(2): 164-181.
- Coll, R. K. 1996. The BSc (Technology): Responding to the challenges of the education marketplace. *Journal of Cooperative Education*. 32(1), 29–35.
- Coll, R.K. & Zegward, K.E. 2006. Perceptions of desirable graduate competencies for science and technology new graduates. *Research in Science and Technological Education* 24(1): 29-58.
- Coll, R.K. & Eames, C. 2007. Learning science and technology through cooperative education. *Asia-Pacific Journal of Cooperative Education*. 8(2), 131-147
- Central University of Technology, Free State (CUT). 2004. *Teaching and learning plan: 2004-2007–Institutional Plan of the CUT*.
- Central University of Technology, Free State (CUT). 2013a. *CUT community engagement philosophy*.
- Central University of Technology, Free State (CUT). 2013b. *CUT community engagement plan*.
- Creswell, J.W. & Plano Clark, V.L. 2006. *Designing and conducting mixed method research*. Los Angeles: Sage.

- Cromwell, L. 1986. *Teaching Critical Thinking in the Arts and Humanities*. Milwaukee: Alverno College.
- De Vos, A.S. (Ed.), Strydom, H., Fouché, C.B. & Delport, C.S.L. 2002. *Research at grass roots: For the social sciences and human service professions*. 2nd Edition. Pretoria: Van Schaik.
- Dewey, J. 1938. *Experience and Education*. New York: MacMillan Publishing Company.
- Donahue, D.M., Bowyer, I, & Rosenberg. 2003. Learning with and learning from: Reciprocity in service-learning in teacher education. *Equity & Excellence in Education* 36(1): 15-27.
- Drennan, J. 2009. Critical thinking as an outcome of a Master's degree in Nursing programme. *Journal of Advanced Nursing* 66(2): 422-431.
- Duckenfield, M. & Swanson, L. 1992. Service-learning meeting the needs of youth at risk. National Dropout Prevention Center. Ref. No. 2103-22.
- EUdict. 2014. What is Oribus Onum?
<http://www.eudict.com/?lang=lateng&word=orbis+unum>
 Retrieved on 16 January 2012.
- Elam, C.L., Sauer, M.J., Stratton, I. D., Skelton, J., Croeker, D. & Musick, D.W. 2003. Service learning in the medical curriculum: Developing and evaluating an elective experience. *Teaching and Learning in Medicine* 15: 194-203.
- Erasmus, M. 2007. Service-learning: Preparing a new generation of scientists for a mode 2 society. *Journal for New Generation Sciences* 5(2): 26-38.
- Eyler, J. 2002. Reflection: Linking service and learning—linking students and communities. *Journal of Social Issues* 58(3): 517-534.
- Eyler, J. & Giles, D. 1999. *Where's the learning in service learning?* San Francisco: Jossey-Bass.

Eyler, J.S., Giles, D.E. Jr., Stenson, C.M. & Gray, C.J. 2000. At a glance: What we know about the effects of service-learning on college students, faculty, institutions and communities, 1993-2000. 3rd Edition. Vanderbilt University.

<http://www.Ewucommunityengagement.pbworks.com/w/file/fetch/62951195/aag.pdf>

Retrieved 31 August 2001.

Fenton, B. and Mazulewicz, J. 2008. Natural leadership instinct online. Trustworthiness.

<http://www.omnivise.com/research/trustworthiness.htm>

Retrieved 31 August 2011.

Forbes, B.E. 2007. South African Society for Cooperative Education: A cooperative education policy for work-integrated learning programmes.

Fourie, M. 2003. Beyond the ivory tower: Service-learning for sustainable community development. *South African Journal of Higher Education*, 17(1): 31-38.

Goddard, J. 2011. Proceedings of the Community Engagement Conference, East London, South Africa: South African Higher Education Community Engagement Forum. 8-10 November 2011.

Goldberg, L.R. & Coufal, K.L. 2009. Reflections on service-learning, critical thinking, and cultural competence. *Journal of College Teaching and Learning*, 6(6) October: 39-50.

Gredler, M.E. 1992. *Learning and instruction: Theory to practice*. 2nd Edition. Englewood Cliffs, N.J.: Macmillan Publishing Company.

Groenewald, T. 2004. Towards a definition of cooperative education. In Coll, R.K. & Eames, C. (Eds.) *International handbook for cooperative education: An international perspective of the theory, research and practice of work-integrated learning*. Boston: World Association for Cooperative Education (WACE). pp. 17-25.

Harkavy, I. & Hartley, M. 2010. Pursuing Franklin's dream: Philosophical and historical root of service-learning. *American Journal of Community Psychology* 46(3-4): 418- 427.

Hatcher, J.A., & Bringle, R. 1997. Reflection. Bridging the gap between service and learning. *College Teaching* 45(4):418-427.

<http://www.tandfonline.com/doi/pdf/10.1080/87567559709596221>

Retrieved 18 April 2012.

Heffernan, K. 2001. Service-learning in higher education. *Journal of Contemporary Research and Education* 119(1): 2-8.

HEQC (Higher Education Quality Committee South Africa). 2001. *Founding document*. Pretoria: Council on Higher Education.

HEQC (Higher Education Quality Committee South Africa). 2004a. *Criteria for institutional audits*. Pretoria: Council on Higher Education.

HEQC (Higher Education Quality Committee South Africa). 2004b. *Criteria for programme accreditation*. Pretoria: Council on Higher Education.

HEQC (Higher Education Quality Committee South Africa). 2004c. *Framework for programme accreditation*. Pretoria: Council on Higher Education.

HEQC CHE (Higher Education Quality Committee South Africa. Council on Higher Education). 2006. *Service-learning in the curriculum: A resource for higher education institutions*. Pretoria, South Africa: Council on Higher Education.

HEQC JET (Higher Education Quality Committee South Africa. JET Education Services). 2007. Community engagement in higher education. Proceedings of the CHE-HEQC/ JET-CHESP Conference on Community Engagement in Higher Education. Pretoria, South Africa: Council on Higher Education. 3-5 September 2006.

Hill, J. 1978. *Zion Gate: Baldhead Bridge* (Compact Disk recording). Jamaica NY.: VP Records

Houshmand, A.A., Papadakis, C., Dietrich, N., Keramati, K., McGill, J. & Drexel University. 2007. *One century of cooperative education in the United States, 1906–2006*. Philadelphia, PA: Drexel University.

Hurd, C.A. 2006. *Is service-learning effective? A look at current research*.

http://tilt.colostate.edu/sl/faculty/Is_Service-Learning_Effective.pdf

Retrieved on 16 January 2012.

Jacoby, B. 1996. *Service learning in higher education*. San Francisco: Jossey-Bass.

JET (Joint Education Trust). 1999. JET Bulletin No. 10. September 1999

Julie, H. Daniels, P. & Adonis, T-A. 2005. Service-learning in nursing: Integrating student learning and community-based service experience through reflective practice. *Health SA Gesondheid* 10(14): 41-54.

Karasik, R.J., Maddox, M. & Wallingford, M. 2004. Intergenerational service-learning across levels and disciplines: "One size (does not) fit all". *Gerontology & Geriatrics Education* 25(1): 1-17.

<http://www.haworthpress.com/web/GGE>

Retrieved 6 February 2012

Kendall, J.C. (Ed.). 1990. *Combining Service and Learning; A resource book for Community and Public Service*. Vol. 1. North Carolina: National Society for Internship and Experiential Education.

Kolb, D.A. 1984. *Experiential learning: Experience as the source of learning and development*. New Jersey: Prentice-Hall.

Kiely, R. 2005. A transformative learning model for service-learning: A longitudinal case study. *Michigan Journal of Community Service Learning* 12(1) Fall 2005: 5-22.

Kuhn, T.S. 1996. *The structure of scientific resolution*. Chicago: University of Chicago Press.

Kruger, SW. 2013. Community- based education and Service-learning: experiences of Health Sciences students at the University of the Free State. (Unpublished PhD thesis). Bloemfontein: University of the Free State.

Laplante, N. 2007. A description of the meaning of reciprocity for undergraduate Baccalaureate Nursing students engaged in service-learning. (Unpublished PhD thesis). Chester, PA: Widener University.

Leedy, P.D. & Ormrod, J.E. 2010. *Practical research planning and design*, 9th Edition. New Jersey: Pearson.

Leslie, M. 2010. Exploring the developmental outcomes of service-learning in higher education for partner organisations: An exploratory study of two modules at Stellenbosch University. (Unpublished Master of Philosophy dissertation). Stellenbosch: Stellenbosch University.

Levy, K. & Lehna, C. 2002: A service-oriented teaching and learning project. *Paediatric Nursing* 22(3): 219-221.

LinkOnLearning. 2013. What is e-learning?

<http://www.linkonlearning.com/corporate/elearning/definitions.htm>

Retrieved 18 April 2013.

Manoharan, P.K. 2010. *Research methodology*. New Delhi: APH Publishing Corporation.

Martinez-Mier, E.A., Soto-Rojas, A.E., Stelzner, S.M., Lorant, D.E., Riner, M.E. & Yoder, K.M. 2011. An international, multidisciplinary, service-learning program: An option in the dental school curriculum. *Education for Health* 11(online): 259.

<http://www.educationforhealth.net>

Retrieved 23 April 2014.

Mouton, J. & Marais, H.C. 1991. *Basiese begrippe: metodologie van die geesteswetenskappe*. Pretoria: RGN Uitgewers.

Melville, S. & Goddard, W. 2001. *Research Methodology. An introduction*. 2nd Edition. Landsdown: Juta Publishers.

Mustafa, A. 2010. *Research methodology*. Delhi: Aitbs Publishers.

Naudé, L. 2010. Connecting the I to the We: using interactive reflection in service learning. *Journal for New Generation Sciences* 9(2): 72-86.

Neill, J. 2006. Analysis of professional literature Class 6: Qualitative research I.

<http://www.wilderdom.com/OEcourses/PROFLIT/Class6Qualitative1.htm>

Retrieved 10 April 2012.

Nigro, G. & Wortham, S. 1998. *Service-learning through action research*. In Bringle, R.G. & Duffy, D.K. (Eds.) *Collaborating with the community: Psychology and service-learning*. Washington, DC: American Association for Higher Education. pp. 161-170.

Nokes, K., Nickitas, D., Keida, R. & Neville, S. 2005. Does service-learning increase cultural competency, critical thinking and civic engagement? *Journal of Nursing Education* 44(2): 65-70.

<http://www.slackjournals.com/article.aspx?rid=34959>

Retrieved 20 February 2012.

O'Halloran, D. 2001. Radiography at Leeds. *Journal of Vocational Education & Training* 58(1): 108-119.

Paul, R. 1993. *Critical thinking: What every person needs to know to survive in a rapidly changing world*. Rohnert Park, CA: Center for Critical Thinking.

Prinsloo, A., Joubert, G. & Du Toit, G. 2006. Community-based education: A case study of the MED 113 Expo at the University of the Free State. *Acta Academica* 38(3): 96-122.

Pritchard, A. 2005. *Ways of Learning: Learning Theories and Learning Styles in the Classroom*. London: David Fulton Publishers Ltd

- Richardson, S. 2006. The power of service-learning. *Techniques: Connecting Education & Careers* 81(1): 38-40.
- Roos, V., Temane, Q.M., Davis, L., Prinsloo, C.E., Kritzinger, A., Naudé, E. & Wessels, J. 2005. Service learning in a community context: Learners' perception of a challenging training paradigm. *South African Journal of Psychology* 35(4): 703-716.
- Ross, E. & Deverell, A. 2004. *Psychosocial approaches to health, illness and disability : A reader for health care professionals*. Pretoria: Van Schaik.
- RSA DoE (Republic of South Africa. Department of Education). 1997. White Paper 3. A programme for higher education transformation. *Government Gazette* No. 18207, 15 August 1997. Pretoria: Government Printers.
- South African Society for Cooperative Education. 2010. <http://www.sasce.co.za/> Retrieved 12 February 2012.
- Sedlak, C.A., O' Doheny, M., Panthoffer, N & Anaya, E. 2003. Critical thinking in students' service learning experiences. *College Teaching* 51(3): 99-103.
- Sheffield, E.C. 2005. Service in service-learning education: The need for philosophical understanding. *The High School Journal* 89(1): 46-53. University of North Carolina Press.
- Shenton, A. 2004. Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information* 22(2004): 63-75.
- Sigmon, R.L. 1979. Service learning: Three principles. *Synergist*. 8(1):9-11.
- Sigmon, R.L. 1996. *Journey to service-learning. Experiences from independent liberal arts colleges and universities*. Washington, DC: Council of Independent Colleges.
- Singh, M. 2001. *Re-inserting the 'Public Good' into Higher Education*. Kagisano Higher Education Discussion Series Issue No. 1 Summer 2001. Pretoria: Council on Higher Education.

Singham, M. 2005. *The achievement gap in US education: Canaries in the mine, the achievement gap between black and white students*. Maryland: Rowman and Littlefield Education.

South African Qualifications Authority (SAQA). 1997. Graduate Attributes, A baseline study on South African graduates from the perspective of employers

http://www.saqa.org.za/docs/genpubs/2009/graduate_attributes.pdf

Retrieved 20 November 2012.

South African Qualifications Authority (SAQA). 2012. SAQA Registered qualification.

<http://regqs.saqa.org.za/viewQualification.php?id=65320>

Retrieved 20 November 2012.

Srinivas, S.C. & Wrench, W.W. 2012. Evaluation of a service-learning elective as an approach to enhancing the pharmacist's role in health promotion in South Africa. *African Journal of Health Professions Education* 4(2): 107-111.

Swindon, L. 2005. Developing skills for the workplace: A comparison of students' and workplace supervisors' perception on the development of critical workplace skills in radiography training. (Unpublished Master's dissertation). Durban: University of KwaZulu-Natal.

Trochim, W. M.K. 2006: Research Methods Knowledge base: Descriptive statistics.

<http://www.socialresearchmethods.net/kb/statdesc.php>

Retrieved 30 November 2012.

University of the Free State, School of Medicine. 2000. *University of the Free State. Phase I Guide Curriculum 2000*. Bloemfontein: UFS.

Vandebilt University, School of Medicine. 2014. Biostatistics

<https://medschool.vanderbilt.edu/biostatistics/content/what-biostatistics>

Retrieved on 16 January 2012.

Vernon, A. & Ward, K. 1999. Campus and community partnerships: Assessing impacts and strengthening connections. *Michigan Journal of Community Service-learning* 6(1): 30-37.

Vygotsky, L.S. 1978. Interaction between learning and Development. From Mind and Society. Cambridge, MA: Harvard University Press.

Watson, G. & Glaser, E. 2002. *Watson-Glaser Critical Thinking Appraisal–UK Edition*. London: Pearson Assessment. pp. 1-13.

Webster's Online Dictionary. 2013. Research.

<http://www.merriam-webster.com/dictionary/research>

Retrieved 8 August 2013.

Weismann, J.S., Betancourt, J., Campbell, E.G., Park, E.R., Kim, M., Clarridge, B., Blumenthal, D., Lee, K.C. & Maina, A.W. 2005. Resident physicians preparedness to provide cross-cultural care. *Journal of American Medical Association* 294(9): 1058-1067.

Wellington, B & Austin, P. 1996. Orientations to reflective practice. *Educational Research* 38(3): 307-316.

West, K., Kweli, T. & Stephens, J. 2004. I try. A-Z Lyrics.

<http://www.azlyrics.com/lyrics/talibkweli/itry.html>

Retrieved 30 November 2013.

White, H. 2001. Problem-based Education. *Speaking of Teaching. Stanford University Newsletter on Teaching* 11(1): 1-8.

Wiig, E.H. & Wiig, K.M. 1999. *On conceptual learning*. Hong Kong: Knowledge Research Institute.

Zlotkowski, E. 1998. *Successful service-learning programs: New models of excellence in higher education*. Bolton: Anker.

Zlotkowski, E., Carneiro, M., Clayton, P. & Whitney, B. 2005. Reclaiming 'reflection': Tapping the Academic and civic learning potential of service-learning through critical reflection. Preconference Workshop. The Civic Engagement Imperative: Student Learning and the Public Good. Providence, RI, USA: AAC&U and Campus Compact.

Personal communiqué

Patterson, R. 1988. Afrikaans Teacher. Dr Blok High School. Interview conducted on 30 November 1988.

APPENDICES

Appendix A - Terminology

Biostatistics

Biostatistics is the branch of statistics responsible for the proper interpretation of scientific data generated in the biology, public health and other health sciences (Vanderbilt 2014:Online)

Nexus

Current and completed Research projects in South Africa (NRF).

Oribus Onum

One world (EUdict 2014:Online)

Pedagogical regression

Reverting to the origins of teaching and learning.

Postulate to praxis

Moving from Hypothesis to practicing from experience.

Pluroversity

"Civic university", which can be described the city as a living laboratory (Goddard 2011:Presentation)

Appendix B – Nexus search results

Document no. 025040
 Researcher(s) Engel-Hills PC
 Title An integrated learning curriculum for radiography
 Language English
 Purpose DTech: Radiography
 Status Completed YEAR OF COMPLETION :- 2005
 Institution Cape Peninsula University of Technology
 Subject(s) Medical sciences: Pharmacology and therapeutics
 Training and education
 Intended Publ. Thesis

Document no. 996304
 Researcher(s) Engel-Hills PC
 Title The development of criteria for the evaluation of an integrated curriculum, using a multi-method approach, for the purpose of improving workbased learning in radiography
 Language English
 Purpose MTech
 Status Current YEAR OF COMMENCEMENT :- 2002
 Institution Peninsula Technikon
 Subject(s) Medical sciences: Pharmacology and therapeutics
 Training and education
 Medical sciences: Pharmacology and therapeutics
 Radiotherapy and electrotherapy
 Intended Publ. Dissertation

Document no. 972105
 Researcher(s) Scholtz MS
 Title A needs assessment survey for continuous professional education amongst diagnostic radiographers for the Free State Province
 Language English
 Purpose MDip Tech
 Status Completed YEAR OF COMPLETION :- 2000
 Institution Stellenbosch University

Subject(s) Education

Teacher education and training

Intended Publ. Thesis; Dissertation

Abstract Continuing Professional Education (CPE) is a method by means of which radiographers and other health care professionals can systematically maintain, improve and broaden their knowledge and skills. Chances are that mandatory CPE will be introduced for South African radiographers by the year 2001. For this reason it was decided to undertake a needs assessment survey of Free State Province diagnostic radiographers. The aim of this study was to assess the perceived needs of Free State Province radiographers. In this way adults, as consumers of CPE, were involved in the planning process. Results obtained from the needs assessment provide valuable information to providers of CPE activities. With the aid of the results, providers can plan activities responsibly, which will satisfy their target population. The needs assessment was done by means of a mail-administered questionnaire, and a response rate of 58 percent was obtained. Data analyses showed that most of the radiographers were employed in small x-ray departments and, due to this fact, experienced constraints regarding CPE participation. Constraints such as staff shortages and a lack of backup staff were identified. New developments in radiography, management skills, computer skills and Ultrasound were the topic areas indicated by the highest percentage of respondents as high level of need areas. Flexible learning strategies with adequate support mechanisms must be developed. In order to provide high-quality CPE activities, all stakeholders, such as the Technikon Free State, the Society of Radiographers, the employers and the radiographers, must share the responsibility of CPE. The study showed that close co-operation between stakeholders is essential to the success of CPE in the Free State Province.

Document no. 024919
Researcher(s) Chipeya LNR
Title An assessment of readiness for self-directed learning of diploma students in a South African technikon
Language English
Purpose MPhil
Status Completed YEAR OF COMPLETION :- 2004
Institution Stellenbosch University
Subject(s) Education
Administration and management (at tertiary level)
Intended Publ. Dissertation
Abstract Self-directed learning is a teaching and learning strategy considered important in fostering lifelong learning. Students take responsibility for their own learning with or without the help of others. It is expected of higher education institutions to prepare students for the dynamic world of work so that graduates are multi-skilled individuals capable of working and the same time be lifelong learners.

 The aim of this study was to assess the readiness to engage in self-directed learning of radiography diploma students at the Technikon Witwatersrand. Assessing the students' readiness to engage in self-directed learning is the first step in the planning and implementation of self-directed learning.

 The Self-Directed Learning Readiness Scale was the instrument used to assess the students' readiness to engage in self-directed learning. The instrument is widely used to assess students' perceived attitudes towards self-directed learning. The scale was administered to a total of 133 students registered for the National Diploma Radiography: Diagnostics at the Technikon Witwatersrand in the year 2003. Of the 133 students, 51, 36 and 46 were in first, second and third year respectively.

 Data analysis revealed that the first year students' mean score on self-directed learning

readiness was relatively higher than those of second and third year students. Assessment practices and prior exposures to self-directed teaching principles were identified as factors that had an influence on how the students perceived themselves to be ready to be self-directed.

 Results obtained from this study provide valuable information for the Department of Radiography at the Technikon Witwatersrand and any other institution in the preparation, implementation and conceptualization of self-directed learning as a teaching and learning strategy.

 Recommendations were that lecturers should assume self-directed learning approaches to the first year students from the onset while gradually introducing self-directed teaming strategies to the second and third year students.

Document no. 328693
 Researcher(s) Human EJ
 Title Structuring a course in communication and psychology for the student therapeutic radiographer, 1981-1986
 Language English
 Purpose MRad
 Status Completed YEAR OF COMPLETION :- 1987
 Institution University of Pretoria
 Subject(s) Medical sciences
 Medical technologies, Bio-engineering
 Intended Publ. Dissertation
 Abstract The structuring of a course In Communication and Psychology for the student Therapeutic Radiographer is centred around the research conducted during 1981 - 1986 to establish a means whereby radiography students of the Department of Radiotherapy and Oncology of the Hillbrow and Johannesburg Hospitals were assisted in reaching an improved emotional equilibrium in the Cancer Treatment situation. The introduction highlights the prevalent and worldwide need for

the provision of a structured support system to assist caregivers in expanding and learning the skills of coping with their own and with the patient's emotional need in the Cancer Treatment situation, the vital role of verbal and nonverbal communication skills is expressed as a vehicle through which these coping mechanisms may be facilitated. The structuring of a course in basic psychology and communication is based upon an indepth assessment of the coping needs of the student radiographer as manifested behaviourally during the eighteen month post basic Radiotherapy Diploma course. These needs are discussed and a parallel is noted between the researcher's model and that of B C Harper's coping model for the Health Care Professional. The explorative nature of a pilot course is discussed with the objective of further defining the radiographer/patient relationship needs and the most effective way to support these in the lecture and group dynamic discussion format. The structure of this course is outlined and the way in which the set objectives were met or alternatively the direction in which the researcher was encouraged to move is discussed. The structured course which was introduced in 1983 is outlined with a discussion of the lecture programme and the value of role play and group dynamic sessions in actualizing the lecture content. An evaluation of the Course in both the short and long term provides the rationale for the changes in lecture content from the pilot study to the structured course. It further gives impetus to the changes envisaged In a dynamic programme such as discussed. Statistical evaluation shows an increase in numbers of applicants for the National Diploma Radiotherapy Course and an increase in the numbers of Radiotherapy Radiographers remaining actively involved in the profession post introduction of the Psychology Course. These numbers prove to be statistically significant. That the possibility the significant increase In Radiographer-in-service figures

during 1981 - 1986 period, compared with the preceding 1976 - 1980 period, may be due, in some part, to the introduction of the course in basic Psychology and Communication, cannot be discounted.

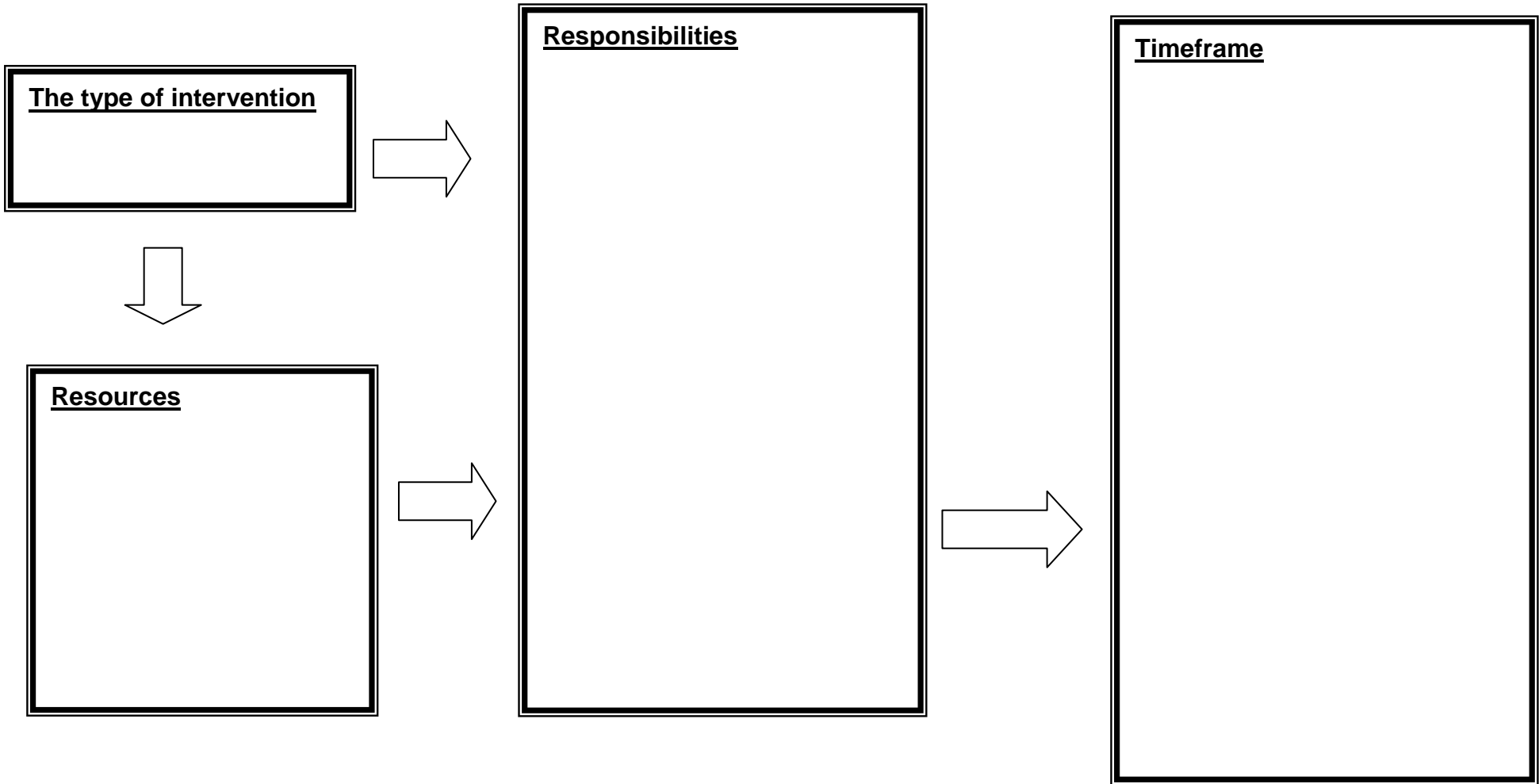
Appendix C – Mind map

Mind map

RADIOGRAPHY, RADIOGRAPHIC SERVICES AND MAMMOGRAPHY

CREDITS: 4 OF 24 (40 NOTIONAL HOURS)

Student numbers:



Appendix D – Invitation and approval – Free State Department of Education



Afdeling Gesondheidswetenskappe-Onderwys/ Division of Health Sciences Education
Kantoor van die Dekaan / Office of the Dean
Fakulteit Gesondheidswetenskappe / Faculty of Health Sciences
bezuidj@ufs.ac.za

TEL (051) 405-3095
FAKS/FAX (051) 444-3505
E-Pos/E-mail:

10499 Grassland
 Bloemfontein
 9306
 14 August 2012

Free State Department of Education
 Private Bag 20565
 Bloemfontein

Dear Mr. MJ Motebe

Service-Learning Research project.

As you know Service-Learning is a facilitation method where students interact with the community, have to achieve specific outcomes and will be assessed on these.

Since 2010, the Radiography students have interacted with Brebner High, Dr Blok High, Sand du Plessis High, St Bernards High as well as Tsoseletso by means of Service-Learning. Targeting the grade 12 learners concentrating on the dissemination of information related to the availability of medical imaging services in their region as well as information on Mammography (breast cancer), Obstetric Ultrasound and Bone Density. This articulates well with the grade 12 Natural Science syllabus that includes x-rays and Doppler ultrasound.

Additionally to the current project, I hereby request the permission of the Department of Education as stipulated by the guidelines of the Ethics Committee of the University of the Free State to conduct a Service-Learning Ph. D research project. The title of the project is: **A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA**. The overall goal of the study is to develop a philosophy and methodology for SL in Radiography. The following will facilitate this:

- To establish whether the community benefits from Radiography SL
Grade 12 and community contact person (identified teacher at each school) rubrics;
- To establish whether SL cultivates social responsiveness in students
- To investigate the effectiveness of SL in allowing students to achieve the generic skills.
- To analyse whether reciprocity is achievable when doing SL in Radiography

The data gathered during the study would require no additional activities on the schools' part; the way we are currently doing things will not change. To this effect, I will provide more information in the form of an information sheet.

Should you have any concerns or questions, please feel free to contact me; contact details are provided below.

Please note:

Participants may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at telephone number (051) 4052812 if they have questions about their rights as a research subject.

Yours truly,

.....
 René Botha (Mr.)
 Tel: +27 51 507 3179
 Fax: +27 51 507 3354
 E-mail: rbotha@cut.ac.za

Dr J Bezuidenhout (Promoter)
 Tel: +27 51 405 3095
 Fax: +27 51 444 3505
 E-mail: jbezuid@ufs.ac.za



education

Department of
Education
FREE STATE PROVINCE

Enquiries: LV Alexander
Reference: 16/4/1/27 - 2012

Tel: 051 404 9283
Fax: 086 6678 678
E-mail: research@edu.fs.gov.za

2012 - 08 - 15

Mr R. W. Botha
10499 Grassland
BLOEMFONTEIN
9306

REGISTRATION OF RESEARCH PROJECT

1. This letter is in reply to your application for the registration of your research project.
2. Research topic: **A framework for service-learning in Undergraduate Radiography Programme in the Mangaung Area.**
3. Your research project has been registered with the Free State Education Department.
4. Approval is granted under the following conditions:-
 - 4.1 The name of participants involved remains confidential.
 - 4.2 The questionnaires are completed and the **interviews are conducted outside normal tuition time.**
 - 4.3 This letter is shown to all participating persons.
 - 4.4 A bound copy of the report and a summary on a computer disc on this study is donated to the Free State Department of Education.
 - 4.5 Findings and recommendations are presented to relevant officials in the Department.
5. The costs relating to all the conditions mentioned above are your own responsibility.
6. **You are requested to confirm acceptance of the above conditions in writing to:**

**DIRECTOR: STRATEGIC PLANNING, POLICY AND RESEARCH,
Old CNA Building, Maitland Street OR Private Bag X20565, BLOEMFONTEIN, 9301**

We wish you every success with your research.

Yours sincerely

M. J. MOTHEBE
DIRECTOR: STRATEGIC PLANNING, POLICY AND RESEARCH

Directorate: Strategic Planning, Policy & Research – Private Bag X20565, Bloemfontein, 9300 – Room 301, Old CNA building,
Maitland Street, Bloemfontein 9300 – Tel: 051 404 9283/ Fax: 086 6678 678 E-mail: research@edu.fs.gov.za

www.education.fs.gov.za

Appendix E – Example Invitation – Participating schools + all approvals



Afdeling Gesondheidswetenskappe-Onderwys/ Division of Health Sciences Education

TEL (051) 405-3095

Kantoor van die Dekaan / Office of the Dean

FAKS/FAX (051) 444-3505

Fakulteit Gesondheidswetenskappe / Faculty of Health Sciences

E-Pos/E-mail: bezuidj@ufs.ac.za

10499 Grassland

Bloemfontein

9306

24 August 2012

St Bernard's High School
3510 Nyoakong Road
Bochabela
9323

Dear Mr. Pitso

Service-Learning Research project.

I would like to thank you for your continued willingness to participate in the Service-Learning project. As you know Service-Learning is a facilitation method where students interact with the community, have to achieve specific outcomes and will be assessed on these.

As discussed, the Radiography Service-Learning module will target your grade 12 learners concentrating on the dissemination of information related to the availability of medical imaging services in your region as well as certain examinations.

As per agreement, some of our third year learners and I will visit your school during term 1, 2012 to:

- discuss the planned intervention
- do a needs (resource) analysis
- correlate our timeframes with your planning

Additionally to the current project, I hereby also invite you to participate in a Service-Learning Ph. D research project. The title of the project is: A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA. The overall goal of the study is to develop a philosophy and methodology for SL in Radiography. The following will facilitate this:

- To establish whether the community benefits from Radiography SL
Grade 12 and community contact person rubrics;
- To establish whether SL cultivates social responsiveness in students
- To investigate the effectiveness of SL in allowing students to achieve the generic skills.
- To analyse whether reciprocity is achievable when doing SL in Radiography

The data gathered during the study would require no additional activities on your part; the way we are currently doing things will not change. To this effect, I will provide more information in the form of an information sheet. I will also discuss the information sheet with you when we meet. You will also be required to complete a consent form.

Should you have any concerns or questions, please feel free to contact me; contact details are provided below.

Yours truly,

.....
René Botha (Mr.)

Tel: +27 51 507 3179

Fax: +27 51 507 3354

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ST. BERNARD'S HIGH SCHOOL

P.O. BOX 16031 BATHO 9307 BLOEMFONTEIN TEL (051) 4322432 TEL/FAX (051) 4324167 FAX 0866301349
saintbernards@webmail.co.za


TO WHOM IT MAY CONCERN

This serve to confirm approval of the PhD Health Professions Education Research Project be conducted at St. Bernard's High School.

Name of Student: R.W. BOTHA (Student no. 1991339258)

Project title: A FRAME WORK FOR SERVICE -LEARNING IN
UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE
MANGAUNG AREA.

Yours faithfully


Mr. T.P. Pitso
(Principal)



20/09/2011
Date

Hoërskool Sand du Plessis



POSBUS 32015
FICHARDTPARK
9317
PASTEURRYLAAN
BLOEMFONTEIN
9301

Telefoon: 051 522 6698
051 522 4071
Faks: 051 522 6993

admin@sannies.co.za

TO WHOM IT MAY CONCERN

This serves to confirm approval of the PhD Health Professions Education Research Project be conducted at Sand du Plessis Secondary School.

Name of student : R W BOTHA (student nr. 1991339258)

The title of the project : A FRAMEWORK FOR SERVICE-LEARNING IN UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA

Yours faithfully

R.J. DOUBELL

PRINCIPAL

2012-09-06



 **VIC BALL**
Plumbers cc

Reg. No.: CK 89/04519/23

Kantoor: (051) 522 6409

Rossouw: 082 824 2562

Lettie: 083 308 8389



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PLUMBERS
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Tsoseletso High School

ADMIN:

E-mail: info@tsoseletsohs.co.za
 motlolometsiv@tsoseletsohs.co.za

OUR REF:.....

Tel.: (051) 4352485

P.O. Box 23624

Fax: (051) 4355440

Kagisanong

YOUR REF:.....

9309

10 Sept 2012

TO WHOM IT MAY CONCERN

This serves to confirm approval of the PhD Health Professions Education Research project be conducted at Tsoseletso High School by the following:

Name of student: R.W BOTHA (Student number: 199133958)

**Project: A FRAME OF WORK FOR SERVICE-LEARNING IN UNDERGRADUATE RADIOGRAHY
 PROGRMTAMME IN THE MANGAUNG AREA**

Yours Faithfully

**M.M.V MOTLOLOMETSU
 HEADMASTER**



DR BLOK SEKONDÊRE SKOOL
DR BLOK SECONDARY SCHOOL



✉ 21048
HEIDEDAL, BLOEMFONTEIN,
9306
☎ (051) 432 4431 / 0841945790
📠 (051) 432 4431 / 0854009027

TO WHOM IT MAY CONCERN


20 September 2012

This serves to confirm approval of the PhD Health Profession Education Research Project be conducted at Dr. Blok Secondary School.

Name of student : R.W Botha (Student no. 1991339258)

Project title : **A Frame work for Service-Learning in Undergraduate Radiography Programme in Mangaung Area.**

Yours truly


MacPherson D
Principal





Brebner High School

P.O. BOX 28703 DANHOF 9310 TEL.: (051) 4362267/4362508 FAX: (051) 4364791
CELL.: 082 947 8961 E-Mail: headmaster@brebnerhigh.co.za

TO WHOM IT MAY CONCERN

This serves to confirm approval of the PhD Health Professions Education Research Project be conducted at Brebner High School.

Name of student: R.W. BOTHA (Student no. 1991339258)

Project title: A FRAME WORK FOR SERVICE-LEARNING IN
UNDERGRADUATE RADIOGRAPHY PROGRAMME IN
THE MANGAUNG AREA

Yours faithfully


AW TAYLOR
HEADMASTER

06-09-2012
DATE



Appendix F - Grade 12 rubric

Name of school:.....

 5

Date:.....

 6-11

Visit:

 12

Presentation

		1	3	5	TOTAL
1	Organisation	Students jumps around	Logical sequence	Logical, interesting sequence	
2	Slides	<ul style="list-style-type: none"> ➢ Slides have no logical layout ➢ Font size too small and slides have too much information ➢ Three misspellings and/or grammatical errors 	<ul style="list-style-type: none"> ➢ Slides have a logical layout ➢ Font size too small or slides contain too much information ➢ Two misspellings and/or grammatical errors 	<ul style="list-style-type: none"> ➢ Slideshow organised and well prepared, ➢ Font size correct and slides contain optimal information ➢ No misspellings or grammatical errors 	
3	Body language & eye contact	<ul style="list-style-type: none"> ➢ Reflects little confidence ➢ Irritating habits during the presentation. ➢ Students occasionally uses eye contact 	<ul style="list-style-type: none"> ➢ Reflects confidence most of the time, ➢ One or two irritating habits during the presentation ➢ Student occasionally uses eye contact 	<ul style="list-style-type: none"> ➢ Reflects confidence all the time ➢ No irritating habits during the presentation, ➢ Makes an effort to maintain eye contact most of the time 	
4	Voice	<ul style="list-style-type: none"> ➢ Student's voice is low. ➢ Student pronounces terms incorrectly. 	<ul style="list-style-type: none"> ➢ Student's voice is clear. ➢ Student pronounces most words correctly. 	<ul style="list-style-type: none"> ➢ Student uses a clear voice ➢ Correct, precise pronunciation of terms 	

 13

 14

 15

 16

4 Usefulness of intervention

		1	3	5	Total
1	Content knowledge	No new knowledge gained	I gained basic knowledge	I gained comprehensive knowledge	
2	Level understanding	Understood nothing	Understood some concepts	Understood all concepts	
3	Level usefulness	Will not use information	Certain aspects useful	Valuable information	
4	Empowerment	Will not tell others about information	Will tell others about some of the information	Will tell others about all of the information	
5	Have you benefitted from this experience?				Yes No

 17

 18

 19

 20

 21

Explain your answer.

How can we improve future visits?

Appendix G – Information Sheet

I, René Botha, am doing research on

A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA

Research is just the process to learn the answer to a question. The QUESTION or the PURPOSE of this study is to evaluate the efficiency of SL as a learning facilitation method. In doing this the purpose can be further unpacked under the headings of enhancement related to the participants, whether it inform the curriculum, and whether it is still SL even though all the criteria characterising academic community engagement are not satisfied.

SL is “a credit-bearing educational experience in which students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content” (Bringle and Hatcher 1996: 222).

Third- year Radiography students prepared and executed dramatized presentations, grade 12 learners, contact persons at five schools and the Radiography facilitator evaluated the presentations using different rubrics. The radiography students completed a structured reflection adapted from Zlotkowski, *et al.* (2005) and the Watson-Glaser Critical thinking tool. Radiography academics will be required to participate in a semi- structured interview once per year for the duration of the study: 2013- 2014. This will be facilitated by the annual Radiography Education Discussion meeting, the 18 monthly congress of the Society of Radiographers of South Africa (SORSA) and if necessary Skype®.

The success of this project relies on your participation.

Participation is voluntarily; you may decline participation or withdraw at any point during the procedure without fearing any repercussion.

The interview will require ±30 minutes ..

Participants will not receive any compensation or any form of remuneration.

No costs / payment will be required from participants.

The results of the study will be presented at conferences and published in academic journals.

Efforts will be made to keep personal information confidential. Absolute confidentiality cannot be guaranteed. Personal information may be disclosed if required by law.

The information received during the project will only be used for research purposes and will not be released for any employment-related performance evaluation, promotion and/or disciplinary purposes.

Any further queries should be forwarded to the following persons:



René Botha (Mr.)

Tel: +27 51 507 3179

Fax: +27 51 507 3354

E-mail: rbotha@cut.ac.za



Dr J Bezuidenhout (Promoter)

Tel: +27 51 405 3095

E-mail: jbezuid@ufs.ac.za

Ms Henriette Strauss

Research Division (Ethics Committee)

Tel: +27 51 405 2812

Fax: +27 51 444 4359

E-mail: StraussHS@ufs.ac.za

Appendix H – School's Consent form



Afdeling Gesondheidswetenskappe-Onderwys/ Division of Health Sciences Education
Kantoor van die Dekaan / Office of the Dean
Fakulteit Gesondheidswetenskappe / Faculty of Health Sciences

TEL (051) 405-3095
FAKS/FAX (051) 444-3505
E-Pos/E-mail: bezuidj@ufs.ac.za

Participating school's DECLARATION OF INTENT

As part of an PhD study

A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA

I, representingschool hereby declare that:

The information provided on Appendix G (the information sheet) was explained to me by the researcher.....

- I hereby give consent to participate in the study.
- I understand what is expected of me.
- I am participating of my own free will.
- I understand that there is no remuneration involved.
- I understand that respondents may withdraw from the study at any time if they so wish without negative consequences
- I understand that personal information will be confidential and anonymous.
- I understand that autonomy will be respected.
- I understand that the recordings, transcripts and data of this interview can be used for future projects stemming from this current research

I also declare that I understand the consequences of providing wrong information.

Print name of school: _____

Signature of school representative: _____

Date: _____

Please note:

Participants may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at telephone number (051) 4052812 if they have questions about their rights as a research subject.

.....
René Botha (Mr.)
Tel: +27 51 507 3179
Fax: +27 51 507 3354
E-mail: rbotha@cut.ac.za


Dr J Bezuidenhout (Promoter)
Tel: +27 51 405 3095
Fax: +27 51 444 3505
E-mail: jbezuid@ufs.ac.za

Service-Learning Outcomes Achieved Visit 3

Name of school:.....

 5

Date:.....

--	--	--	--	--	--	--	--

 6-11

Visit:

 12

Presentation

1. Strongly agree SA
2. Agree A
3. Disagree D
4. Strongly disagree SD

Outcomes		SA	A	D	SD	
1.	Outline the ultrasound service availability from the FSDoH					<input type="checkbox"/> 13
2.	Reflect on the ethical issues related to obstetric ultrasound examinations					<input type="checkbox"/> 14
3.	Recall indications for obstetric ultrasound					<input type="checkbox"/> 15
4.	Discuss the various uses of ultrasound in obstetric sonography					<input type="checkbox"/> 16
5.	Prepare a mock examination (demonstration)					<input type="checkbox"/> 17
6.	Discuss the <u>basic</u> Physical Principles of ultrasound					<input type="checkbox"/> 18
7.	Describe how 3-D and 4D ultrasonic imaging is achieved					<input type="checkbox"/> 19
8.	Discuss the Doppler effect and the use thereof in medical imaging					<input type="checkbox"/> 20
9.	Describe the causes of bone mineral deficiency					<input type="checkbox"/> 21
10.	Discuss the basic principles of DXA (different absorptions-to get the measurements)					<input type="checkbox"/> 22
11.	Discuss the basic measurements used in DXA (BM measurements)					<input type="checkbox"/> 23
12.	Discuss the scores used to compare patient bone density (T/Z)					<input type="checkbox"/> 24

Appendix K – Radiography Education Discussion group questionnaire



Afdeling Gesondheidswetenskappe-Onderwys/ Division of Health Sciences Education
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Service-Learning (SL) is:

“a credit-bearing educational experience in which students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content” (Bingle and Hatcher 1996:222). In South Africa, there has not been any formal research done on the impact of Service-Learning in resource-based disciplines like Radiography. Consequently no clear methodology and philosophy of Service-Learning exists.

The purpose of this questionnaire is to enquire whether you institution’s Radiography programme is engaged is SL. Please answer the following questions by supplying the appropriate answer:

Name of institution:

Are you currently engaged in SL as described by Bringle and Hatchet (1996)	Yes	No	1	2
Under which module does it fall?				
Who are your community and who your service provider? Community: Service Provider:				
Briefly explain your intervention.				

.....
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J. Bezuidenhout
Dr J Bezuidenhout (Promoter)
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Appendix L – Invitation - Radiography Facilitator



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10499 Grassland
 Bloemfontein
 9306
 1 June 2012

Service-Learning Research project

As you know Service-Learning is a facilitation method where students interact with the community, have to achieve specific outcomes and will be assessed on these.

Not a lot of Radiography programmes nationally are involved in Service-Learning. In South Africa, there has not been any formal research done on the impact of Service-Learning in resource-based disciplines like Radiography. No clear methodology and philosophy of Service-Learning exists and neither has any measured impact or enhancement associated with Radiography Service-Learning ever been done.

I hereby also invite you to participate in a Service-Learning Ph. D research project. The title of the project is: A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA. The overall goal of the study is to develop a philosophy and methodology for Service-Learning in Radiography. The following will facilitate this:

- To establish whether the community benefits from Radiography SL
- To establish whether SL cultivates social responsiveness in students
- To investigate the effectiveness of SL in allowing students to achieve the generic skills.
- To analyse whether reciprocity is achievable when doing SL in Radiography

Your will be required to participate in a semi- structured interview once per year for the duration of the study: 2012- 2014. I will provide more study related information in the form of an information sheet. I will also discuss the information sheet with you when we meet. You will also be required to complete a consent form.

Should you have any concerns or questions, please feel free to contact me; contact details are provided below.

Yours truly,

.....
 René Botha (Mr.)
 Tel: +27 51 507 3179
 Fax: +27 51 507 3354
 E-mail: rbotha@cut.ac.za

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 E-mail: jbezuid@ufs.ac.za

Appendix M – Radiography Facilitator Consent form



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Participating radiography facilitator's DECLARATION OF INTENT

As part of an PhD study

A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA

All academic personnel involved in Radiography SL as described by Bringle and Hatcher (1996:222): "a credit-bearing educational experience in which students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content" (Bringle and Hatcher 1996:222).

I, hereby declare that:

The information provided on Appendix G (the information sheet) was explained to me by the researcher.

- I hereby give consent to participate in the study.
- I understand what is expected of me.
- I am participating of my own free will.
- I understand that there is no remuneration involved.
- I understand that respondents may withdraw from the study at any time if they so wish without negative consequences
- I understand that personal information will be confidential and anonymous.
- I understand that autonomy will be respected.
- I understand that the recordings, transcripts and data of this interview can be used for future projects stemming from this current research

I also declare that I understand the consequences of providing wrong information.

Print name of Institution: _____

Signature: _____

Date: _____

Please note:

Participants may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at telephone number (051) 4052812 if they have questions about their rights as a research subject.

.....
 René Botha (Mr.)
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Appendix N – Radiography facilitator Semi-structured interview

Institution:.....

Date:

SL is “a credit-bearing educational experience in which students participate in an organised service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content and achieve personal growth” (Bringle and Hatcher,1 996: 222).

We impose our agenda on communities; they play no role in establishing outcomes
Communities benefits from Radiography SL
SL cultivates social responsiveness in students and change behaviour
SL cultivates critical thinking in students
SL allows students to achieve the generic skills
SL allows students to achieve specific outcomes.
Reciprocity (enhancement of the curriculum) is achievable when doing SL in Radiography

SL assists students to identifying and solving problems
SL assists students to display creative and critical thinking
SL assists students to work effectively with others in the community and educational environment.
SL assists students to manage themselves with respect to in the community intervention, educational environment and in a personal context.
SL assists students to communicating effectively in the community and educational environment.
SL assists students to use science and technology effectively in the community and educational environment.
SL assists students to acquire a high level of information literacy- additional resources.
SL assists students to understanding themselves and diagnostic radiography within the national health and social system.

Appendix O – ISETL conference delegates

Institution:

Date:

 1-4

 5

 6-11

Please use the following key:

- | | | |
|----|----------------|----|
| 1. | True | T |
| 2. | Probably True | PT |
| 3. | Probably False | PF |
| 4. | False | F |

		T	PT	PF	F	
1	Communities benefits from Radiography SL					<input type="checkbox"/> 12
2	SL cultivates social responsiveness in students and change behaviour					<input type="checkbox"/> 13
3	SL cultivates critical thinking in students					<input type="checkbox"/> 14
4	SL allows students to achieve the generic skills					<input type="checkbox"/> 15
5	SL allows students to achieve specific outcomes.					<input type="checkbox"/> 16
6	Reciprocity (enhancement of the curriculum) is achievable when doing SL					<input type="checkbox"/> 17

		T	PT	PF	F	
1	SL assists students to identifying and solving problems					<input type="checkbox"/> 18
2	SL assists students to display creative and critical thinking					<input type="checkbox"/> 19
3	SL assists students to work effectively with others in the community educational environment.					<input type="checkbox"/> 20
4	SL assists students to manage themselves with respect to in the community intervention, educational environment and in a personal context.					<input type="checkbox"/> 21
5	SL assists students to communicating effectively in the community educational environment.					<input type="checkbox"/> 22
6	SL assists students to use science and technology effectively in the community and educational environment.					<input type="checkbox"/> 23
7	SL assists students to acquire a high level of information literacy- additional resources.					<input type="checkbox"/> 24
8	SL assists students to understanding themselves and their role within society					<input type="checkbox"/> 25

Appendix P – Invitation for Radiography Students to participate



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10499 Grassland
 Bloemfontein
 9306
 Date to be Added

Dear Radiography student

Service-Learning Research project.

As you know Service-Learning is a facilitation method where students interact with the community, have to achieve specific outcomes and will be assessed on these.

Not a lot of Radiography programmes nationally are involved in Service-Learning. In South Africa, there has not been any formal research done on the impact of Service-Learning in resource-based disciplines like Radiography. No clear methodology and philosophy of Service-Learning exists as well as no measured impact or enhancement associated with Radiography Service-Learning ever been done.

I hereby also invite you to participate in a Service-Learning Ph. D research project. The title of the project is: A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA. The overall goal of the study is to develop a philosophy and methodology for Service-Learning in Radiography. The following will facilitate this:

- To establish whether the community benefits from Radiography SL
- To establish whether SL cultivates social responsiveness in students
- To investigate the effectiveness of SL in allowing students to achieve the generic skills.
- To analyse whether reciprocity is achievable when doing SL in Radiography

Your will be required to participate complete The Watson Glaser Critical Thinking Tool and participate in an online reflection discussion after visits 2 and 3. These will be discussed with you at length. You will be provided with guideline to complete the online discussion as well as additional study related information in the form of an information sheet. I will also discuss the information sheet with you in class. You will also be required to complete a consent form.

Should you have any concerns or questions, please feel free to contact me; contact details are provided below.

Yours truly,

.....
 René Botha (Mr.)
 Tel: +27 51 507 3179
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 E-mail: rbotha@cut.ac.za

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Appendix Q – Radiography students Consent form



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Participating student's DECLARATION OF INTEND

As part of an PhD study

A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA

I, hereby declare that:

The information provided on Appendix E (the information sheet) was explained to me by the researcher.

- I hereby give consent to participate in the study.
- I understand what is expected of me.
- I am participating of my own free will.
- I understand that there is no remuneration involved.
- I understand that respondents may withdraw from the study at any time if they so wish without negative consequences
- I understand that personal information will be confidential and anonymous.
- I understand that autonomy will be respected.
- I understand that the recordings, transcripts and data of this interview can be used for future projects stemming from this current research

I also declare that I understand the consequences of providing wrong information.

Print name of student: _____

Signature of student: _____

Date: _____

Please note:

Participants may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at telephone number (051) 4052812 if they have questions about their rights as a research subject.

.....
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Appendix R - Guidelines for completion of reflection and discussion

Thank you for agreeing to participate in the research project: A FRAMEWORK FOR SERVICE-LEARNING IN THE UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA.

Reflection is defined as the intentional consideration of an experience as it is considered within the context of particular learning objectives.

The following are some guidelines for participation in the reflection and discussion groups.

1. Participants are being asked to reflectively respond to the questions provided by the researcher in the reflection rubric and group discussions.
2. In a reciprocal relationship, every participant involved in SL is both a teacher and a learner because each is viewed as an equal in the relationship. No one participant is viewed as more important than another, all participants are equally important.
3. Students will complete appendix S after each of site visits 2 and 3. Students have to give substantive responses to the questions posed.
4. During the following week (a class week), interactive discussion of their answers completes the process.
5. During discussions, all participants are required to respond in an appropriately respectful manner to the questions and other participants. Each participant has something valuable to add to the discussion and should feel that their responses are treated in a respectful manner.
6. Participants are encouraged to answer clearly so that the meanings of their responses are easy for all to understand. Please limit your use of abbreviations, again so that the true meaning of your response is clear.
7. The researcher, Mr Botha, will minimally respond to the participants' discussions.
8. Confidentiality of SL partners is important. Discussion in general terms without identifying information, such as names should be given.
9. Any participant who chooses to discontinue participation in the discussion group is asked to email the researcher to inform her(his?) of this decision.
10. All discussions will be recorded and independently transcribed.

.....
 René Botha (Mr.)
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 Fax: +27 51 507 3354
 E-mail: rbotha@cut.ac.za


 Dr J Bezuidenhout (Promoter)
 Tel: +27 51 405 3095
 Fax: +27 51 444 3505
 E-mail: jbezuid@ufs.ac.za

Appendix S – Model Questions for completion of reflection and discussion

Name of school:Date:

Section A: QUESTIONS FOR STUDENTS TO EXAMINE AND ANALYSE THE SERVICE-LEARNING EXPERIENCES FROM THE **ACADEMIC LEARNING AND ENHANCEMENT DOMAIN** (Zlotkowski, *et al.* 2005)

What did you learn from the scholars?

What did you learn from your fellow students?

What differences are there between the academic material as presented in the course, and what you discovered during preparation and execution of the presentation?

Are these differences significant enough to alter the outcomes of the learning units?

What are the possible reasons for any differences? For example, were there possible biases/assumptions/agendas on the part of the author/lecturer or on my part?

How could these be addressed?

How has this experience enhanced your knowledge of specific outcomes, theory or concept?

Does it reinforce your prior understanding?

In what ways?

<p>Does it challenge your prior understanding?</p> <p>In what ways?</p>
<p>What additional information would you need to put yourself in a better position to better the module content?</p>

Section B: QUESTIONS FOR STUDENTS TO EXAMINE AND ANALYSE THE SERVICE-LEARNING EXPERIENCES FROM THE **PERSONAL GROWTH AND SOCIAL RESPONSIVENESS DOMAIN** (Zlotkowski, *et al.* 2005)

<p>How did this experience make you feel (positively and/or negatively)?</p> <p>Should you have felt different?</p> <p>Why?</p>
<p>Did you, or did you not, experience difficulty working/interacting with other people?</p> <p>Group</p> <p>Community</p> <p>What could you do differently next time to minimise such difficulties or further improve on such relationships?</p> <p>Group</p>

Community
<p>What assumptions did you bring to the situation (including my assumptions about other persons involved) that affected your actions or decisions?</p> <p>Which of the above proved true?</p> <p>Which did not prove true?</p>
<p>Have past experiences influenced the way that you acted or the decisions that you made during the process (positive and negative)?</p> <p>Clarify?</p>
<p>What personal strengths of yours did the situation reveal?</p> <p>In what ways did they affect the situation:</p> <p>Positively</p> <p>Negatively</p> <p>What could you do to build on strengths?</p> <p>What personal weaknesses of yours did the situation reveal?</p>

<p>In what ways did they affect the situation:</p> <p>Positively</p> <p>Negatively</p> <p>What could you do to overcome weaknesses?</p>
<p>How did this situation reinforce your:</p> <p>personal values</p> <p>beliefs</p> <p>convictions</p> <p>How did this situation challenge your:</p> <p>personal values</p> <p>beliefs</p> <p>convictions</p>
<p>Should I/they have worked with others in a different way?</p>

Section C: QUESTIONS FOR STUDENTS TO EXAMINE AND ANALYSE THE SERVICE-LEARNING EXPERIENCES FROM THE **MANAGEMENT POINT OF VIEW** (Zlotkowski, *et al.* 2005)

1 Were you given appropriate orientation regarding the purpose of SL?

Yes No

1 2

2 Were you given appropriate orientation of the SL process?

Yes No

1 2

Was the action appropriate to the situation?

3 Do you think the SL intervention addressed community needs as intended?

Yes Partially No

1 2 3

Clarify your answer in the above question.

How can the relationship between the CUT and the community in relation to the Service-Learning be improved?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1-4
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	-----

Appendix T – Watson-Glaser Critical Thinking Appraisal tool

Name of school:.....

 5

Date:.....

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6-11
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	------

Visit:

 12

Section A: CRITICAL THINKING

1. Inference Test:

Please use the following key:

1. True T
2. Probably True PT
3. Probably False PF
4. False F

Statement 1:

SL is "a credit-bearing educational experience in which students participate in an organised service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content and achieve personal growth" (Bringle and Hatcher,1996:222).

		T	PT	PF	F	
1	We impose our agenda on communities; they play no role in establishing outcomes					<input type="checkbox"/> 13
2	Communities benefit from Radiography SL					<input type="checkbox"/> 14
3	SL cultivates social responsiveness in students and changes behaviour					<input type="checkbox"/> 15
4	SL cultivates critical thinking in students to achieve the generic skills and specific outcomes					<input type="checkbox"/> 16
5	Reciprocity (enhancement of the curriculum) is achievable when doing SL in Radiography					<input type="checkbox"/> 17

Statement 2:

Service-Learning (SL) facilitates the achievement of Generic skills.

		T	PT	PF	F	
1	SL assisted me to identify and solve problems					<input type="checkbox"/> 18
2	SL assisted me to display creative and critical thinking					<input type="checkbox"/> 19
3	SL assisted me to work effectively with others in the community					<input type="checkbox"/> 20
4	SL assisted me to work effectively with others in the educational environment					<input type="checkbox"/> 21
5	SL assisted me to manage myself with respect to in the educational					<input type="checkbox"/> 22

 23

	environment and in a personal context				
6	SL assisted me to communicate effectively				
7	SL assisted me to use science and technology effectively				
8	SL assisted me to acquire a high level of information literacy (additional resources)				
9	SL assisted me to understanding my role and diagnostic radiography within the national health and social system				

2. **Assumptions Test:**

In relation to the statement, indicate whether the assumption is:

1. True Yes
2. False No

Statement 1:

SL is a means of achieving social justice; developing the collective good

		Yes	No	
1	SL targets poor/previously disadvantaged communities			<input type="checkbox"/> 27
2	SL creates better communities			<input type="checkbox"/> 28
3	SL facilitated the development of the self			<input type="checkbox"/> 29
4	SL assists/improves the way we interact with others			<input type="checkbox"/> 30

Statement 2:

SL has an element of reciprocity; SL enhances the academe.

		Yes	No	
1	SL enhances Teaching, Learning and Assessment			<input type="checkbox"/> 31
2	SL facilitates the development of cognitive ability; the way we interact with each other, to share ideas, to argue, to solve problems			<input type="checkbox"/> 32
3	SL experiences assists in the construction of own knowledge			<input type="checkbox"/> 33
4	SL process does not have a changing effect on the content of learning units			<input type="checkbox"/> 34
5	SL interaction has a changing effect on the content of learning units			<input type="checkbox"/> 35

3. **Deductions Test:**

In relation to the statement, indicate whether the deduction is:

1. True Yes

2. False No

Statement 1:

SL creates social responsiveness in students. Therefore

		Yes	No	
1	All interactions with society develops social responsiveness in students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 36
2	The purpose of SL is purely academic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 37
3	Students will better assist patients due to the SL interaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 38

Statement 2:

Appropriate SL benefits the community. Therefore

		Yes	No	
1	SL minimises the developmental gaps between different groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 39
2	SL does not promote access to services and information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 40
3	Community medical wellbeing is enhanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 41
4	Community needs are not important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 42

Statement 3:

SL has an element of reciprocity; SL enhances the academe. Therefore

		Yes	No	
1	Peer interaction & collaborative learning is important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 43
2	SL requires the use of a variety of resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 44
3	SL challenges the theory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 45
4	SL can lead to curriculum changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 46

4. Interpretation Test:

In relation to the statement, indicate whether the interpretation is:

3. True Yes

4. False No

Statement 1:

From the grade 12 assessments of SL, it was clear that the presentations and slide shows were excellent, with an average percentage of 80%. Grade 12s indicated that SL provided them with new knowledge, most said that it was useful and empowering (they would be able to tell others); some indicated that they did not understand all the information and that elocution was a problem in some instances. Radiography learners

indicated that it was a positive experience: they could reinforce previous knowledge, be more involved in own knowledge creation, teamwork was excellent, it was confidence building and that they would like to get more involved in community initiatives.

		Yes	No	
1	SL does not improve graduate's skills to unpack outcomes in a user friendly way			<input type="checkbox"/> 47
2	Communities are receptive to the SL interaction			<input type="checkbox"/> 48
3	Communities are appreciative of the SL interaction			<input type="checkbox"/> 49
4	Students have an appreciation for their environment.			<input type="checkbox"/> 50
5	Students do not understand their role in society better			<input type="checkbox"/> 51
6	Reciprocity in relation to enhancement of the academe is achieved through SL			<input type="checkbox"/> 52

5. **Evaluation of arguments Test:**

In relation to the statement, indicate whether you agree with the arguments as follow:

1. The argument is strong **Strong**
2. The argument is weak **Weak**

Statement 1:

Changing students' attitudes, perception and behaviours through specific outcomes and application of generic skills benefits both the community and students. This is accomplished through reciprocity that allows the construction of own knowledge by students thinking critically.

		Strong	Weak	
1	No, SL does not improve social responsiveness in students			<input type="checkbox"/> 53
2	Yes, SL has an effect on the academe			<input type="checkbox"/> 54
3	No, SL is a waste of time and resources			<input type="checkbox"/> 55
4	No, SL is not a good Teaching and Learning method			<input type="checkbox"/> 56
5	No, communities do not benefit from SL			<input type="checkbox"/> 57
6	Yes, students do benefit from SL			<input type="checkbox"/> 58

Appendix U – Memorandum - Watson-Glaser Critical Thinking Appraisal Tool

Site visit:

2	3
---	---

Date:.....

Section A: CRITICAL THINKING

1. Inference Test:

Please use the following key:

1. True T
2. Probably True PT
3. Probably False PF
4. False F

Statement 1:

SL is "a credit-bearing educational experience in which students participate in an organised service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content and achieve personal growth" (Bringle and Hatcher,1996:222).

	T	PT	PF	F
We impose our agenda on communities; they play no role in establishing outcomes				✓
Communities benefit from Radiography SL	✓			
SL cultivates social responsiveness in students and changes behaviour	✓			
SL cultivates critical thinking in students to achieve the generic skills and specific outcomes	✓			
Reciprocity (enhancement of the curriculum) is achievable when doing SL in Radiography	✓			

Statement 2:

Service-Learning (SL) facilitates the achievement of Generic skills.

	T	PT	PF	F
SL assisted me to identify and solve problems	✓			
SL assisted me to display creative and critical thinking	✓			

SL assisted me to work effectively with others in the community	✓			
SL assisted me to work effectively with others in the educational environment	✓			
SL assisted me to manage myself with respect to in the educational environment and in a personal context	✓			
SL assisted me to communicate effectively	✓			
SL assisted me to use science and technology effectively	✓			
SL assisted me to acquire a high level of information literacy (additional resources)	✓			
SL assisted me to understanding my role and diagnostic radiography within the national health and social system	✓			

2. Assumptions Test:

In relation to the statement, indicate whether the assumption is:

1. True Yes
2. False No

Statement 1:

SL is a means of achieving social justice; developing the collective good

	Yes	No
SL targets poor/previously disadvantaged communities		✓
SL creates better communities	✓	
SL facilitated the development of the self		✓
SL assists/improves the way we interact with others	✓	

Statement 2:

SL has an element of reciprocity; SL enhances the academe.

	Yes	No
SL enhances Teaching, Learning and Assessment	✓	
SL facilitates the development of cognitive ability; the way we interact with each other, to share ideas, to argue, to solve problems	✓	
SL experiences assists in the construction of own knowledge	✓	<input type="checkbox"/>

SL process does not have a changing effect on the content of learning units		✓
SL interaction has a changing effect on the content of learning units	✓	

3. Deductions Test:

In relation to the statement, indicate whether the deduction is:

1. True Yes

2. False No

Statement 1:

SL creates social responsiveness in students. Therefore

	Yes	No
All interactions with society develops social responsiveness in students		✓
The purpose of SL is purely academic		✓
Students will better assist patients due to the SL interaction	✓	

Statement 2:

Appropriate SL benefits the community. Therefore

	Yes	No
SL minimises the developmental gaps between different groups	✓	
SL does not promote access to services and information		✓
Community medical wellbeing is enhanced	✓	
Community needs are not important		✓

Statement 3:

SL has an element of reciprocity; SL enhances the academe. Therefore

	Yes	No
Peer interaction & collaborative learning is important	✓	
SL requires the use of a variety of resources	✓	
SL challenges the theory	✓	
SL can lead to curriculum changes	✓	

4. Interpretation Test:

In relation to the statement, indicate whether the interpretation is:

3. True Yes
4. False No

Statement 1:

From the grade 12 assessments of SL, it was clear that the presentations and slide shows were excellent, with an average percentage of 80%. Grade 12s indicated that SL provided them with new knowledge, most said that it was useful and empowering (they would be able to tell others); some indicated that they did not understand all the information and that elocution was a problem in some instances. Radiography learners indicated that it was a positive experience: they could reinforce previous knowledge, be more involved in own knowledge creation, teamwork was excellent, it was confidence building and that they would like to get more involved in community initiatives.

	Yes	No
SL does not improve graduate's skills to unpack outcomes in a user friendly way		✓
Communities are receptive to the SL interaction	✓	
Communities are appreciative of the SL interaction	✓	
Students have an appreciation for their environment.	✓	
Students do not understand their role in society better		✓
Reciprocity in relation to enhancement of the academe is achieved through SL	✓	

5. Evaluation of arguments Test:

In relation to the statement, indicate whether you agree with the arguments as follow:

3. The argument is strong Strong
4. The argument is weak Weak

Statement 1:

Changing students' attitudes, perception and behaviours through specific outcomes and application of generic skills benefits both the community and students. This is accomplished through reciprocity that allows the construction of own knowledge by students thinking critically.

	Strong	Weak
No, SL does not improve social responsiveness in students	✓	
Yes, SL has an effect on the academe	✓	
No, SL is a waste of time and resources		✓
No, SL is not a good Teaching and Learning method		✓
No, communities do not benefit from SL		✓
Yes, students do benefit from SL	✓	

**Appendix V – Extended abstract published in the African Journal of Health Professions
Education**

SERVICE-LEARNING: EXPERIENCES OF THE FIRST YEAR OF COMMUNITY ENGAGEMENTS BY CENTRAL UNIVERSITY OF TECHNOLOGY RADIOGRAPHY LEARNERS.

Botha R.W.

Central University of Technology, Bloemfontein

Context and setting

Service-Learning is:

“a credit-bearing educational experience with organised service activities that meet identified community needs and reflect on the service activity in such a way as to gain further understanding of course content”. Using Service-Learning as a facilitation method in resource-based disciplines like Radiography is challenging.

Why the idea was necessary

In a recent survey it was established that only two of six Radiography programmes at tertiary institutions in South Africa are currently doing Service-Learning. How effectively can Service-Learning be used as a facilitation method in resource-based disciplines? The aim of the study in progress is to investigate and describe the Service-Learning experiences of third year Radiography students and community partners.

What was done

Service-Learning needs to be identified by the community rather than being imposed on them by outsiders. In discussions with students, it was found that most rural communities do not know about medical imaging and they were not aware of services provided by the Free State Department of Health (FSDoH).

Third year Radiography students were divided into three groups, each with its own identified rural community. Learners visited their community, contact persons were identified and the groundwork for the two follow-up visits was laid. Students decided that we will concentrate on the dissemination of information related to medical imaging in general, mammography, ultrasound and bone densitometry. Our service provider, the FSDoH's interests were addressed by spreading information related to services available.

Each group prepared and executed dramatized presentations, and grade 12 learners and contact persons at each site evaluated the presentations using different rubrics. The Radiography facilitator's assessment rubric evaluated whether students included all the outcomes in their presentations. After the interventions radiography students had to complete a structured reflection adapted from Zlotkowsk, *et al.*

Evaluation of results and impact

Looking at the results collectively for the different sites, it was clear from the grade 12 assessments ($n = 150$) that the presentations and slide shows were excellent with an average of 81.35%. Evaluating the content grade 12 learners assigned a percentage of 77.8%, indicating that the information was new, useful and empowering (they would be able to tell others). The contact persons ($n = 5$), all teachers, felt that some of the content was beyond learners' grasp; this however did not come from the grade 12 learners. Elocution and the predominant use of English was a problem in some instances. From the students' reflection reports, the interventions were experienced positively: they could reinforce previous knowledge, they were more involved in own knowledge creation and teamwork was excellent. The students experience the presentations as confidence building and they indicated that they would like to get more involved in community initiatives.

From these results, it would seem that Service-Learning is effective; it would be interesting to see to what degree reciprocity is achieved.

Appendix W – Evaluation Committee - Faculty of Health Research Committee

19 June 2012

TO WHOM IT MAY CONCERN

On 12 June 2012 the Faculty Management Committee of the Faculty of Health Sciences approved the evaluation committee report for the student and the study as indicated. The Faculty Management made a recommendation to the Faculty Board that the title be approved. The Faculty Board meeting will take place on 7 August 2012. The study must also be submitted to the Ethics Committee of the Faculty for approval.

Candidate: Mr R Botha
Student Number: 1991339258
Degree: PhD (Health Professions Education)
Title: A Framework for Service Learning in Undergraduate Radiography Programme in the Mangaung Area.



Gertraud Groenewald

SECRETARY: FACULTY MANAGEMENT COMMITTEE



Appendix X – Report Biostatistician

Available from UFS Ethics office

Ms Henriette Strauss

Research Division (Ethics Committee)

Block D, Dean's Division, Room D115

Faculty of Health Sciences

P O Box 339 (Internal Post Box G40)

Nelson Mandela Drive

University of the Free State

BLOEMFONTEIN

9300

Tel. (051) 4052812

Fax (051) 4444359

E-mail StraussHS@ufs.ac.za (<mailto:StraussHS@ufs.ac.za>)

Appendix Y – Ethics Approval

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



Research Division
Internal Post Box G40
☎ (051) 4052812
Fax (051) 4444359

E-mail address: StraussHS@ufs.ac.za

Ms H Strauss/hv

2012-10-22

REC Reference nr 230408-011
IRB nr 00006240

MR RW BOTHA
C/O DR J BEZUIDENHOUT
DIVISION HEALTH SCIENCES EDUCATION
FACULTY OF HEALTH SCIENCES
UFS

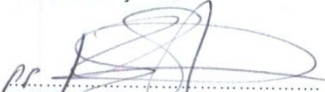
Dear Mr Botha

ECUFS NR 117/2012

PROJECT TITLE: A FRAMEWORK FOR SERVICE-LEARNING IN UNDERGRADUATE RADIOGRAPHY PROGRAMME IN THE MANGAUNG AREA.

- You are hereby kindly informed that the Ethics Committee approved the above study at the meeting held on 18 October 2012 after all the conditions have been met.
- Committee guidance documents: Declaration of Helsinki, ICH, GCP and MRC Guidelines on Bio Medical Research. Clinical Trial Guidelines 2000 Department of Health RSA; Ethics in Health Research: Principles Structure and Processes Department of Health RSA 2004; Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa, Second Edition (2006); the Constitution of the Ethics Committee of the Faculty of Health Sciences and the Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines.
- Any amendment, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.
- The Committee must be informed of any serious adverse event and/or termination of the study.
- A progress report should be submitted within one year of approval of long term studies and a final report at completion of both short term and long term studies.
- Kindly refer to the ECUFS reference number in correspondence to the Ethics Committee secretariat.

Yours faithfully


.....
PROF WJ STEINBERG
FOR CHAIR: ETHICS COMMITTEE

Cc Dr J Bezuidenhout





Research Ethics Committee

The TUT Research Ethics Committee is a registered Institutional Review Board (IRB 00003968) with the US Office for Human Research Protections (OHRP# 0004997) (Expires 19 Jan 2014). Also, it has Federal Wide Assurance for the Protection of Human Subjects for International Institutions (FWA 00011501) (Expires 31 Jan 2014). In South Africa it is registered with the National Health Research Ethics Council (REC-160509-21).

January 28, 2013

Ref #: REC2013/01/003
Name: Botha RW
Student #: University of the Free State

Mr RW Botha
Division Health Sciences Education
Faculty of Health Sciences
University of the Free State

Dear Mr Botha,

Decision: Approval

Name: Botha RW

Proposal: A framework for service-learning in undergraduate radiography programme in the Mangaung area

Qualification: PhD Health Professions Education

Promoter: Dr J Bezuidenhout

Co-promoter: Prof MM Nel

Thank you for submitting the revised appendices for ethics clearance to access TUT Radiography staff members for semi-structured interviews. The revised appendices were assessed by the Research Ethics Committee (REC) Chairperson. The following matters emanated from the assessment:

- **Appendix F, Information Sheet Radiography Facilitator:**
 - The required revisions, including the addition of a statement regarding employment vulnerability, are in order.
 - Note that the revised document still refers to "... at your school" and "... completion of the rubrics" which is not applicable to this particular information sheet.
- **TUT REC Reference Number:**
 - Note that a new TUT REC Reference number (top right corner of this page) has been allocated; it replaces the number indicated on the previous letter (dated 24 Jan 2013).

The Chairperson of the Research Ethics Committee of Tshwane University of Technology reviewed the revised documents. The application is **approved**. The decision will be tabled at the next REC meeting on March 4, 2013 for ratification.



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The proposed research project may now continue with the proviso that:

- 1) The researcher/s will conduct the study according to the procedures and methods indicated in the approved proposal, particularly in terms of any undertakings and/or assurances made regarding informed consent and the confidentiality of the collected data.
- 2) The proposal (inclusive of the applicable information leaflet/s, informed consent document/s, interview guide/s and/or questionnaire/s) will again be submitted to the Committee for prospective ethical clearance if there are any substantial changes from the existing proposal, particularly if those changes affect any of the study-related risks for the research participants.
- 3) The researcher will act within the parameters of any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

Note:

The reference number (top right corner of this communiqué) should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants.

Yours sincerely,



WA HOFFMANN (Dr)
Chairperson: Research Ethics Committee
[Ref# 2013-01-002-BothaRW]



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Botha Rene

From: Van Dyk, Barbara [bvandyk@uj.ac.za]
Sent: 06 February 2013 01:40 PM
To: Swart, Andre; Fourie, Neels
Cc: Lawrence, Heather; Botha Rene
Subject: RE: Application Ethical approval

Noted with thanks. The department also supports this application in principle.

Kind regards

Barbara

HOD Radiography

From: Swart, Andre
Sent: Wednesday, February 06, 2013 8:07 AM
To: Fourie, Neels
Cc: Olsson, Sue; Van Dyk, Barbara; rbotha@cut.ac.za
Subject: RE: Application Ethical approval
Importance: High

Good morning Neels

Trust you are well.

I will have no objection in that colleagues are requested to participate.

Obviously it remains the prerogative of an individual to participate.

Keep well.



Regards
AS

www.uj.ac.za

André Swart (Prof)
Executive Dean, Faculty of Health Sciences
University of Johannesburg

Tel: +27 11 559-6224/5

Fax: +27 11 559-6227



**HEALTH AND WELLNESS SCIENCES RESEARCH ETHICS
COMMITTEE (HW-REC)**

Registration Number NHREC: REC- 230408-014

P.O. Box 1906 • Bellville 7535 South Africa
Symphony Road Bellville 7535
•Tel: +27 21 959 6352 • Fax +27 21 953 8490
Email: danielso@cput.ac.za

21 June 2013
CPUT/HW-REC 2013/H21Ex

Division Health Sciences Education
Faculty of Health Sciences
University of the Free State

Dear Mr RW Botha

APPLICATION TO THE HW-REC FOR ETHICAL CLEARANCE

Approval was granted on 24 April 2013 by the Health and Wellness Sciences-REC to René Walter Botha. This approval is for research activities related to a PhD: Health Professions Education at the University of the Free State.

TITLE: A framework for service-learning in undergraduate radiography programme in the Mangaung area.

Comment:

Approval will not extend beyond 21 June 2014. An extension should be applied for 6 weeks before this expiry date should data collection and use/analysis of data, information and/or samples for this study continue beyond this date.

Note:

The investigator(s) should understand the conditions under which they are authorized to carry out this study and they should be compliant to these conditions. **It is required that the investigator(s) complete an annual progress report that should be submitted to the HW-REC in December of that particular year, for the HW-REC to be kept informed of the progress and of any problems you may encounter.**

Kind Regards



Zuleika Nortjé
CHAIRPERSON – ETHICS RESEARCH COMMITTEE
FACULTY OF HEALTH AND WELLNESS SCIENCES



**FACULTY OF HEALTH AND
ENVIRONMENTAL SCIENCES**

**DEPARTMENT OF CLINICAL
SCIENCES**

**PROGRAMME: DIAGNOSTIC
RADIOGRAPHY (N.Dip Radiography)**

Service-Learning Guide 2013

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Message from the Service-Learning Facilitator

Dear Student,

Welcome to the Service-learning project of the programme Radiography at the Central University of Technology (CUT). May this be a journey of self discovery and spiritual, personal, interpersonal and academic growth which culminates into benefits for all concerned: you, the community and our service providers. Your contribution is important to create social justice and consequently stronger communities. This handbook was developed to act as a tool for you to refer to when needed.

We hope that you will take advantage of all the developmental opportunities associated with Service-Learning to ensure your experience will be a gratifying one. Therefore do not hesitate to ask questions or offer suggestions, to improve the overall quality of the interventions and experience.

May your Service-Learning experience be a fruitful one and may the positive effect of Service-Learning be with you long after you have left the CUT.

CoolRunningz,

René Botha

Coordinator of Radiography Service-Learning (CUT)

☎ : (+2751) 507 3179

✉ : rbotha@cut.ac.za



What is Service-Learning?

For those of you who don't know what service-learning is, let us share a brief overview on the different types of interventions:

Pure Service-Learning (volunteerism)- service to the community by students are the intellectual core of the engagement. It is regarded as a "lightweight" since the content of the course is the service.

Discipline-based Service-Learning- service to the community is related to course content and students reflect on the experience through analysis and improved understanding. The problem with this model is that due to its strong link to the discipline it limits the type and variety of interactions.

Problem-based Service-Learning- service to the community can be referred to a consultancy, where students use their knowledge analyse, advice and thus address community needs. These are limited interaction and thus have the possibility to have limited impact and almost creates a paternalistic relationship where students can also be perceived as experts.

Undergraduate community-based action research- service to the community is connected to a community research project allowing students to additionally acquire research methodology skills.

SL is defined by Bringle and Hatcher (1995:112) as "a credit-bearing educational experience in which students participate in an organised service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content". In comparison to other forms of community service, such as volunteering, SL deliberately integrates community-service activities with educational objectives.

'Service-Learning provides the opportunity to apply classroom-developed knowledge and skills to a community problem thereby increasing the depth and understanding of that knowledge and skill while solving a community problem through interaction with diverse community stakeholders.'

Sigmon (1996:9) explains four perspectives that can shape the SL experience. There can be an emphasis on service, on learning, or on both, together or separately. When both service and learning are emphasised equally and the words are combined with the hyphen, reciprocity is at play for all partners in the experience and the pedagogy is written as SERVICE-LEARNING.

Service-learning is a relationship between three stakeholders (Figure 1) each benefitting from the experience.

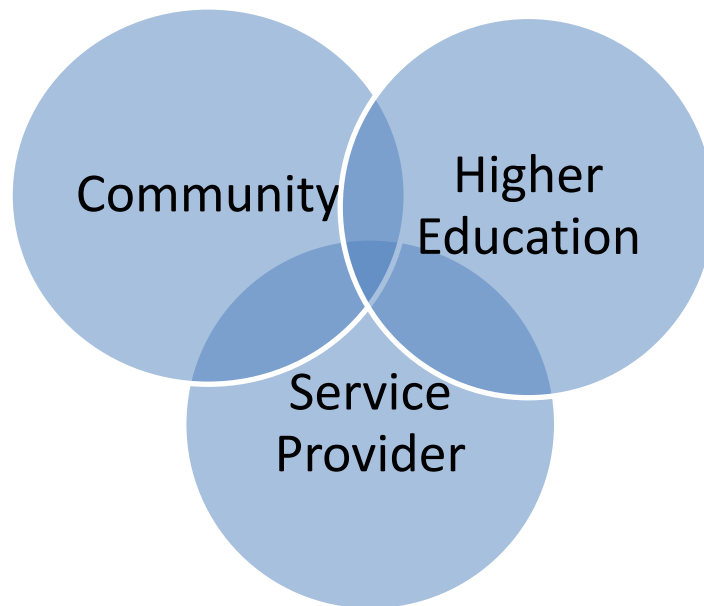


FIGURE 1 CHESP triad partnership model (Lazarus 2001 in HEQC, 2006a:93)

The final word on what is Service-Learning comes from Benjamin Franklin who published a pamphlet already in 1749 entitled: *Relating to the Education of Youth in Pennsylvania* (Harkavy & Hartley 2010:419). In this document Franklin states:

'The idea of what is *true merit*, should often be presented to youth, explain'd and impress'd on their minds, as consisting in an *Inclination* join'd with an *Ability* to serve mankind, one's country, Friends and Family...which *Ability* should be the great *Aim* and *End* of all learning.'

Benefits of Service-Learning

The following is the Alliance for Service Learning in Education Reform (ASLER) standards:e discussed.

CUT CE plan emerging focus areas:

- Eradicating poverty and related conditions (providing community members with basic education, health care, nutrition and protection);
- Promoting human dignity and health (as it denotes respect and status for individuals and better health);
- Increasing social capacity (all levels of leadership, empathy, listening skills, negotiation and persuasion skills, conflict management);
- Development (the [process](#) of [economic](#) and [social transformation](#)); and
- Education (a form of [learning](#) in which [knowledge](#), [skills](#), and [habits](#) of a group of people are transferred from one generation to the next through teaching, training and research. It generally occurs through any [experience](#) that has a formative effect on the way people think, feel, or act) (CUT CE Plan 2013:3).

Benefits to students

- Personal growth refers to the development of characteristics related to self-improvement and self-actualisation;
- Social growth includes the social skills that are necessary for relating to others in society;
- Intellectual growth encompasses the cognitive skills necessary to enhance academic learning and acquired higher-level thinking skills;
- Citizenship refers to the responsibilities relating to participation in a multicultural society and of citizenship in a democracy;
- Preparation for the world of work: Students who have been prepared are able to gain work experience in a variety of areas;
- SL makes connections for students: SL can provide a sense of belonging among students; Developing self-esteem: A characteristic common to students who drop out is low self-esteem;
- SL promotes real success and empowers students: SL provides opportunities for teaching young people the skills they need to become empowered;
- SL changes the values of students: Guided, structured reflection in SL shapes values and beliefs and creates a better future through collaboration with different parties.
- Social problem solving
- Civic innovation and responsibility
- Building personal connections with yourself and others
- Learning in a different atmosphere (not just texts and lectures)
- Learning from experience; hands-on experience
- More actively involvement; more active in-class participation
- Critical thinking through social/current issues

Benefits to the community

Includes sustainable development encompasses concepts like:

- The achievement of lasting satisfaction of human needs,
- The improvement of the quality of human life,
- The idea of self-reliant development, and
- The idea of cost- effective development.

Purpose of the CUT Radiography Service-Learning

The purpose of the Service-Learning project is to disseminate health related information to thereby make communities aware of medical imaging, the availability of medical imaging services in their region, signs and symptoms of disease and prevention and treatment. The overall goal is thus to improve community health.

Development of Cultural Competence

Culture refers to people from different ethnic or racial backgrounds. We might also be talking about people of different ages, socioeconomic conditions, abilities, sexual orientations, languages, religions, etc.

Cultural diversity is a recognition that people of various cultures exist.

Cultural competence refers to your ability to interact effectively with people of different cultures.

Being truly culturally competent requires that you:

- Value diversity. Recognize the contributions that people with diverse backgrounds (including you) have made and continue to make in society.
- Conduct self-assessment. Be honest with yourself about how you feel and be willing to critically examine the roots and implications of your thinking.
- Manage the dynamics of difference. Learn how culture impacts the environment in which you are serving and understand the ways that diversity presents itself, the unique needs of different cultures, and individuals' inherent right to dignity.
- Acquire cultural knowledge. Take advantage of your environment and learn about other cultures by asking questions. Also, share your own cultural knowledge with others.
- Adapt to the diversity and cultural contexts of individuals and communities. Think about your social role and how it fits into the community in which you're serving. Be flexible and willing to experience life through someone else's eyes.

Measures to improve cultural competence:

1. Recognize that childhood, family, and personal experiences can color our perceptions.
2. Recognize that our cultural biases and prejudices travel with us out into the community.
3. Know that our internal thoughts can unconsciously be reflected in our body language and our words.
4. Gain cultural knowledge by reading literature, taking diversity courses, attending cultural fairs and events, and interacting with diverse people.
5. Meet people at where they are at. Try to understand his/her priorities or needs. Identify strengths.
6. Suspend personal judgments about people with whom you are working.
7. Be sensitive to cultural norms that may be displayed through community members' behaviours towards you.

8. Understand that your job as a service-learning student is not to provide charity care, but to work with the community to help alleviate the immediate impacts of larger social issues.

CODE OF ETHICS

For effective engagement with the community the ethical norms should be kept in mind by students:

Students...

- DON'T accept financial or material payment for hours.
- DO be clear about your community site's policies, including any applicable dress codes, call-out procedures, and confidentiality agreements.
- DO maintain a proper standard of behaviour – you'll be subject to appropriate disciplinary action if you choose to behave badly.
- DO report a student who is not maintaining a proper standard of behaviour.
- DO review and observe our Dress code policy, even if your site does not have an established dress code.
- DO maintain confidentiality of all clients with whom you work.
- DO consider your safety and security at all times.
- DON'T engage in direct evangelism (i.e., preaching) during Service-Learning hours.

Service-Learning Standards

As a student of the CUT, you should conduct yourself in a manner consistent with the core values of the Department of Clinical Sciences under which the Radiography programme resorts:

The following core values have been identified and form the basis of the department's future endeavours:

- | | |
|---------------------------|-----------------------|
| • Professionalism | • Teamwork |
| • Excellence | • Ethical standards |
| • Efficient communication | • Equity and fairness |

Reliability: Scheduling commitments must be fully honoured.

- Fully participate in all group activities.
- All group members to attend all site visits.
- Emergencies that prevent you from meeting your commitment require a phone call to your supervisor.

Professionalism: Students are to conduct themselves in a professional manner at all times when working with community and addressing their individual needs.

- Always be punctual.
- Dress appropriately at all times (see section on dress code on page 14)

Sensitivity: Be concerned about the needs and feelings of the community members in the learning experience. This project is based on the concept of reciprocal learning and respect between you and the community partner.

Safety: When you are in the community, be aware of situations and experiences that may affect your own safety. If you feel unsafe at any moment during the Service-Learning interactions, please notify the supervisor immediately. Ask your supervisors to give you instructions and then take the steps to safeguard yourself.

Service-Related Injuries and Illness: We release our community partners from any liability for you during the course of your work. Students registered at the CUT are covered by an institutional insurance.

COMMUNICATION

- Communication is key to building any type of relationship. Tips for a successful communication:
- Be enthusiastic about the partnership. The community agency staff and community members should know you want to be there.
- Remember that the job is your responsibility. If you missed the pre-service orientation, it is your job to reach out to the appropriate staff member and introduce yourself.
- Be as flexible with your schedule as possible. Our partner organizations are usually willing to work with your existing and work schedules, but you must also be willing to work with them.
- Always communicate respect. Respect is shown through a professional appearance, a willingness to listen and learn from supervisors, and the ability to think carefully before you speak.
- Let your supervisors know if you will be late or absent.
- Communicate problems early. If you run into an issue with a student, it's imperative you let your on-site supervisor know so that the problem can be addressed before it escalates. If you have a consistent and/or major problem with another party, inform your supervisor. If necessary the institutional grievance process will be followed.

Regular communication between all role players is important to keep all parties updated on the process and progress. Regular communication with contact persons in reference to e.g. scheduling is critical. The facilitator should monitor communication between students and external stakeholders. Additional communication between group members would have minimised organisational issues.

DRESS CODE

Although we continue to emphasize professional behaviour and appearance to students, they are not always clear about what they should and should not wear to a site. These guidelines are intended to be as specific as possible

without unjustifiably limiting students' freedom of expression.

Students SHOULD NOT wear:

1. Revealing clothing, including:
 - Short or tight skirts or shorts
 - Excessively tight pants
 - Low- or high-cut tops
 - Sheer or netted clothing
 - Halter, tube, or tank tops with spaghetti straps
 - Pants that drop below the hips
2. Flip-flops
3. Torn or ripped clothing
4. Unprofessional attire, including pajamas or sweatpants
5. Shirts displaying vulgar or inappropriate phrases or images

Students SHOULD wear:

1. Casual clothing, including jeans and t-shirts
2. Sneakers, boots, or dress shoes

Reflection and Reflection Discussion Sessions

Reflection and reflection discussion sessions serve as companions to the service-learning experience. In order to have the most impact and meaningful experience, reflections and open dialogues are necessary to make sense of the experience and to open the lines of communication. Speaking about experiences with others helps with comprehension and absorption of the experiences being discussed.

Reflection Sessions

Reflection is the "intentional consideration of an experience in light of particular learning objectives" (Hatcher & Bringle 1997:153). Wellington and Austin (1996:307-316) suggest five orientations for reflective practice, namely,

Immediate: should happen within a short time after the intervention; *in this study reflection happened within a week after the intervention,*

Technical: focuses on the development and conceptualisation of learning throughout the experience; *the reflection rubric used during this study reflects this,*

Deliberative orientation: emphasises the discovery, assignment and assessment of personal meaning; *again, the reflection rubric used reflects this,*

Transpersonal orientation: centres on universal personal liberation.

Hatcher and Bringle (1997:Online) identified the following criteria for producing effective reflection:

- **Bridge the abstract and the concrete:** SL scholarship and research should contribute to both theoretical understanding and practical solutions associated with the multiple facets and outcomes of SL. *The structure and questioning of the reflection rubric allows for this.*
- **Be regular:** SL scholarship and research should be conducted across the implementation of a course, at strategic times for a campus programme, and in a manner that demonstrates growth over time in its capacity to contribute to knowledge and practice. *The scaffolding of activities presented in Section 3.3.2 provides evidence of this practice.*
- **Be structured:** SL scholarship and research should be systematic, and programmatic, and must allow for clear inferences that increase the knowledge base for teaching and learning. *The structure and questioning of the reflection rubric allows for this.*
- **Permit feedback and assessment:** SL scholarship and research should be public (use procedures that are identifiable and understandable) so that it can be reviewed, evaluated, critiqued, and recognised by peers and others (students, service providers, community members). *In this study reflection discussions were conducted within one week after interventions.*

Each service-learning student has to complete the structured reflection after each site visit, which consists of an academic domain, personal growth and social responsiveness domain as well as a management domain. In group format students will also participate in a compulsory reflection discussion session after the interventions to articulate their experiences. Reflection discussion sessions last for forty-five minutes

ACADEMIC CREDITS

Eight credits are awarded to the Service-Learning module. These credits are derived from Radiation Science III. The outcomes of service-Learning come from consultation with stakeholders and the specific learning outcomes come from two third modules Radiation Science III and Clinical radiographic Practice III.

Service-Learning Organisation

Group organisation could be improved through:

- Trusting and respecting other group members;
- Tolerance of diversity (ethical, cultural, religious, socioeconomic and cognitive ability) within the group;
- Motivating each other within the group;
- Improving teamwork;
- Choosing a leader;
- Deciding on roles and responsibilities
- Mind mapping the way forward
- Improving group communication;
- Collaborative research; and
- Proper rehearsal

Service-Learning Rollout

The third-year radiography students were divided into five groups and each group was allocated a community—one of the five participating secondary schools each. These schools were Brebner High School, Dr. Blok Secondary School, St. Bernard's High School, Sand du Plessis High School and Tsoseletso High School. Each group visited their community three times during the academic year. The first visited involved a “meet and greet”:

- To introduce the new students to their contact person;
- To discuss the previous year's intervention;
- To address possible issues stemming from the previous year;
- To discuss the planned intervention;
- To do a needs (resource) analysis; and
- To correlate the CUT's timeframes with the schools' calendar.

During the second visit, in the second term, students had to achieve outcomes related to medical imaging and associated services in the region, and mammography. The needs of our service provider, the FSDoH, were addressed through the spreading of the aforementioned information. The outcomes of the final visit, which took place in the third term, were on obstetric ultrasound and bone densitometry.

Learning activities were scaffolded into different activities including preparation, intervention and reflection.

Activity 1 (Orientation–facilitator)

The facilitator:

- a) Introduced and discussed the principles of SL;
- b) Discussed the purpose of SL;
- c) Explained the partnerships involved;
- d) Discussed the process to be followed; and
- e) Introduced the outcomes to be addressed.

Activity 2 (Preparation–students)

Student groups had to:

- a) Discuss the type of intervention that will address all the outcomes;
- b) Determine the different responsibilities of a group;
- c) Set up a time frame;
- d) Conduct an analysis of resources required and suggest how shortcomings would be addressed;
- e) Compile a mind map (Appendix B) of the project, indicating the different elements contributing to the final product;
- f) Conduct Site visit 1 and discuss the programme with a identified community member, updating him/her on the process and resources available; and
- g) Create the intervention.

Activity 3 (Execution–students)

Student groups had to:

- a) Contact the identified community member and update him/her on the process, formalise appointment (date and time), and provide feedback on resources;
- b) Visit their sites and engage by means of their interventions; and
- c) Complete the critical thinking questionnaire of the SL experience.

Activity 4 (Reflective practice–students and facilitator)

Student groups had to:

- a) Complete the structured reflection of their SL experiences;
- b) Participate in the reflection discussion of their SL experience; and
- c) Readjust in preparation of the next intervention.

Institutional Support

Transport

During Service-Learning site visits the transport system of the academic institution will be used. The supervisor will make the transport arrangements in conjunction with the students and that he/ she accompany students during the interventions.

Counselling

If necessary students with Service-learning related personal issues will be referred to the counselling section of the institution.

Service-Learning Showcase

At the end of the academic year after all the interventions, a Service-Learning showcase will be held to show case and reflect on activities, celebrate achievements and create closure.

Social Responsiveness

The purpose of Service-Learning is additionally to create a sense of social responsiveness that will outlast the Service-Learning engagement and create lasting social justice.

References

- Bringle, R. & Hatcher, J. 1995. A Service-Learning curriculum for faculty. *Michigan journal of Community Service-Learning*. 2: 112- 122.
- Central University of Technology, Free State (CUT). 2013. *CUT Community Engagement Plan*.
- Duckenfield, M. & Swanson, L. 1992. Service-Learning meeting the Needs of Youth at Risk. National Dropout Prevention Center.
- Harkavy, I. & Hartley, M. 2010. Pursuing Franklin's Dream: Philosophy and Historical Root of Service-Learning. *American Journal of Community Psychology*. 46: 418- 427
- Hatcher, J. A., & Bringle, R. 1997. Reflection. *College Teaching* 45 (4).
<http://www.tandfonline.com/doi/pdf/10.1080/87567559709596221>
- Retrieved 18 April 2012.
- HEQC CHE (Higher Education Quality Committee South Africa. Council on Higher Education). 2006a. *Service-Learning in the curriculum: a resource for higher education institutions*. Pretoria, South Africa: Council on Higher Education.

Appendix AA – SL checklist



FIGURE 6.1: STEPS TO BE TAKEN WHEN PLANNING CBE/SL [Compiled by the Researcher, S Kruger: 2012]

Appendix AB – Language Editor's report

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TO WHOM IT MAY CONCERN

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I hereby declare that I copy edited the thesis, **A framework for service-learning in the undergraduate radiography programme in the Mangaung area**, that was submitted for the degree PhD Health Professions Education at the University of the Free State.


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