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**FACTORS INFLUENCING THE ACADEMIC OUTCOMES IN
BIOLOGICAL SCIENCES OF STUDENTS IN A NURSING EDUCATION
INSTITUTION IN THE EASTERN CAPE PROVINCE**

BY

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Declaration

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I declare that **FACTORS INFLUENCING THE ACADEMIC PERFORMANCE IN BIOLOGICAL SCIENCE OF STUDENTS IN A NURSING EDUCATION INSTITUTION IN THE EASTERN CAPE PROVINCE** is my own work and that all sources that have been used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted for any other degree at any other institution.

Fundiswa Beatrice Tom

Date

*Appreciation is a wonderful thing.
It makes what is excellent in others
belong to us as well.*

-Voltaire-

*This thesis is dedicated to my late
father whose vision was that all his
children should be educated*

And

*To my late mother who always
supported my father's vision with
action.*

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Abstract

The four year nursing programme is offered at the NEI in the EC province where this study was conducted. As early as 2009 the majority of first and second year nursing students of the NEI were academically unsuccessful in the subject biological science. This prompted the researcher to conduct a qualitative, contextual, exploratory and descriptive study to explore and describe the factors influencing the academic performance of students in the subject biological science at the NEI.

Following an explanation of the Appreciative Inquiry (AI) process as the framework of the study and the purpose of the study, the consecutive sample of second year nursing students who consented to participate completed a written appreciative interview schedule.

The findings of the content analysis process revealed factors influencing performance in the subject biological science as biological science content, nurse educator characteristics, study strategies, resources and biological science assessments. The recommendation was for all the stakeholders to play their various active roles towards influencing biological science performance positively.

Key words

Appreciative Inquiry, biological science, four year nursing programme and nursing education institution.

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List of abbreviations

AI	Appreciative Inquiry
BNS	Biological and natural sciences
CD	Compact disc
DoH	Department of Health
ECDoH	Eastern Cape Department of Health
ECprov	Eastern Cape province
ETQA	Education and training quality assurance
GNS	General nursing science
ICU	Intensive care unit
NEI	Nursing education institution
Pharm	Pharmacology
SANC	South African Nursing Council
SOAR	Strengths, Opportunities, Aspirations, Results
SWOT	Strengths, Weaknesses, Opportunities, Treats
UP	University of Pretoria

1 ORIENTATION TO THE STUDY

1.1 INTRODUCTION

The comprehensive four year nursing programme offered at a specific nursing education institution (NEI) in the Eastern Cape (EC), leads to the registration as a nurse (General, Psychiatric and community) and a midwife (R425, 2001:1). Biological science is one of the subjects offered as part of the comprehensive four year nursing programme. Biological science includes anatomy, physiology, chemistry, biophysics, microbiology and parasitology. Biological science is an important subject that contributes towards the building of a strong scientific background for nurses (Melichar & Fairman, 2010: 8). This subject would enable the nursing students to understand the normal structure of the human body, its functioning, relevant chemical and biophysical aspects of the body, and aspects of the micro organisms and parasites that could affect the human body (R425 Guide, 1994: 5).

Nursing students who are unable to successfully complete the biological science subject would not be able to complete the comprehensive four year nursing programme. This non completion of the programme would result in the reduction of the output of qualified nurses from the NEI and therefore poses challenges to the already existing shortage of nurses in the Eastern Cape Province (EC province).

The aim of this study was to explore the factors influencing the academic performance of the students in the subject biological science in a specific NEI in the EC province.

1.2 BACKGROUND AND RATIONALE

The decline in the output of qualified nurse practitioners from the nursing education institutions would contribute to the shortage of nurses nationally and internationally. The global shortage of qualified nurse practitioners has resulted in NEIs increasing the intake of nursing students for the comprehensive four year nursing programme with the expectation of increasing the number of qualified nurse practitioners that are desperately required by the healthcare services (Reams & Bashford, 2009: 96; Reinhard & Hassmiller, 2009: 335).

Successful academic performance in nursing education programmes would be critical in the endeavour of increasing the nursing workforce. Nurse educators should therefore design their education and training in a manner that would assist the students to achieve successful academic performance (Prosser & Trigwell, 2000: 25). The education and training provided to students should equip students with knowledge and skills that could be utilised on a daily basis (Jacobs, Vakalisa & Gawe, 2004: 46-47). One of the important responsibilities of the nurse educator would be to evaluate and/or refine the modules of the specific programme he/she is involved in. In view of Billings and Halstead (2005:543) "the primary purpose of programme evaluation is to judge the merit or worth of the total programme, as well as the individual element of the programme".

The NEI is offering the comprehensive four year nursing programme at five different campuses in the EC province. The curriculum is comprised of the following subjects: fundamental nursing science, ethos and professional practice, general nursing science, community nursing science, midwifery, biological science, social science, medicine and surgery and psychiatry (SANC R425 guide, 1994: i). The subject division of the comprehensive four year nursing programme of the NEI is indicated in Table 1.1.

Table 1.1: Subject division of the comprehensive four year nursing programme

Level	1 st year	2 nd year	3 rd year	4 th year
Content	1. Fundamental nursing science 2. Ethos of nursing and professional practice 3. Biological Science 4. Social Science 5. Pharmacology 6. Community nursing science 7. Clinical practice skills	1. Ethos of nursing and professional practice 2. Biological science 3. Social science 4. Pharmacology 5. General nursing science 6. Community nursing science 7. Clinical practice skills	1. General nursing science 2. Psychiatric nursing science 3. Community nursing science 4. Midwifery nursing science 5. Clinical practice skills	1. Psychiatric nursing science 2. Midwifery nursing science 3. Clinical practice skills

Adopted from (NEI, 2010: 14).

As indicated in Table 1.1 biological science is offered on first year level, as well as on second year level. If the student is not academically successful, the subject could be repeated once only at first or second year level (NEI curriculum, 2005: 13 – 14).

The training contract of nursing students stipulates that if they are not successful in the subject biological science during the second attempt, the student's studies would be terminated (NEI policy, 2007: 10). The reality in the NEI in the EC province was that +/- 50% of the nursing students were not academically successful in the subject biological science. Table 1.2 and Table 1.3 indicate the percentage of student that was academically unsuccessful in biological science for 2009.

Table 1. 2: Biological science first year 2009

Campus	Academically unsuccessful
A	30%
B	50%
C	47%
D	18%
E	4%
Average rate	30%

Adopted from (NEI, 2010: 10).

As indicated in Table 1.2 the average rate of students who were academically unsuccessful in the subject biological science amongst first year students were 30%. In Table 1.3 an indication of the academically unsuccessful student in the second year of study is reflected.

Table 1.3: Biological science second year 2009.

Campus	Academically unsuccessful
A	40%
B	51%
C	40%
D	32%
E	22%
Average rate	37%

Adopted from (NEI, 2010: 10).

Shortage of lectures, large numbers of students and inadequate resources were always regarded as the contributing factors influencing academic performance in biological science. The predicament was that the most understaffed and under resourced campus E was having the best academic performance in biological science as evident in Table 1.2 and Table 1.3. This predicament therefore prompted the researcher to conduct a study that would explore and describe the factors influencing the

academic performance of students registered for the subject biological science at the specific NEI.

For the purpose of this study the subject biological science would be explored as part of the four year comprehensive programme. In view of Preskill and Catsambas (2006:16) Appreciative Inquiry (AI) could be applied in a wide variety of evaluation contexts and for different purposes. The application of AI is particularly successful when organisations are interested in using participatory and collaborative approaches to evaluate. For the purpose of this study AI would be utilised to evaluate the subject biological science at a specific NEI in the EC province.

1.3 PROBLEM STATEMENT

In view of Burns and Grove (2009: 68) the research problem identifies an area of concern for a specific population, indicates the significance of the problem, provides a background for the problem and outlines the need for additional research.

As evident in Table 1.2 and Table 1.3 between 22% and 51% of the second year students at a specific NEI was academically unsuccessful in the subject biological science. This had detrimental effects for the nursing profession at large, as well as financially on the Department of Health (DoH). The students are obliged by the NEI policy to discontinue their studies if they failed biological science for the second time (NEI policy, 2007: 10).

This implies that the student number declined significantly when these students go out of the system. This contributed to the severe shortage of qualified nurses countrywide. The discontinuation of students furthermore had severe financial implication for the DoH, as it costed an estimated R62 013.00 per student per study year (Annexure 1 to Circular 3 of 2009).

This made the researcher ask the following research question, to guide this study.

1.4 RESEARCH QUESTION

In view of the background and problem statement, the following research question was formulated:

How can the Appreciative Inquiry process be utilised to conclude factors influencing the academic performance of students in the subject biological science?

1.5 AIM AND OBJECTIVES

The overall aim of this study was to explore and describe the factors influencing the academic performance of students in the subject biological science at a specific NEI in the EC province.

In order to achieve the aim, the following objectives of this study were to:

- Explore and describe the factors influencing academic performance of students in the subject biological science.
- Make recommendations to the nursing education institution and the Department of Health, based on the finding of the study.

1.6 RESEARCHER FRAME OF REFERENCE

The frame of reference of this study would be described in terms of the role of the researcher, setting, relevant paradigm, conceptual framework and conceptual definitions.

1.6.1 Role of the researcher

The four elements of the researcher's role as identified by Creswell (2003:184) would be applied in this study:

- Firstly, the statements included past experiences that provided background data through which the audience could better understand the topic, the setting and the respondents (view Section 1.6.2)
- Secondly, the steps which would be taken to gain entry to the research setting and to secure permission to study the participants were discussed (view Section 1.10)
- Thirdly, comments on connections between the researcher and the participants with regard to the research setting were indicated (view Section 1.9)
- Finally, comments regarding sensitive ethical issues that could arise during the research were documented (view Section 1.10).

1.6.2 The setting

The study was conducted at a large government funded NEI in the EC province. This NEI developed from the amalgamation of the nursing colleges and nursing schools in the EC province. Before 1994 there were four separate nursing colleges and a number of nursing schools in the EC province. These nursing colleges and nursing schools were managed differently. A number of NEIs were autonomous, several semi autonomous whilst a few were under the government hospital management. A number of NEIs were adequately resourced while other NEIs had insufficient resources (EC DoH report on restructuring, 2002: 1).

On the 1st of April 2004 the amalgamation of the nursing colleges and nursing schools in the EC province took place under guidance of the Education and training of nurses and Midwives Act (Act No 4 of 2003: 3).

The re-structured NEI has five main campuses and twelve satellite campuses. These are distributed throughout the regions of the EC province (EC DoH report on restructuring, 2002: 4). Figure 1.1 depicts the distribution of these campuses and satellite campuses of the NEI.

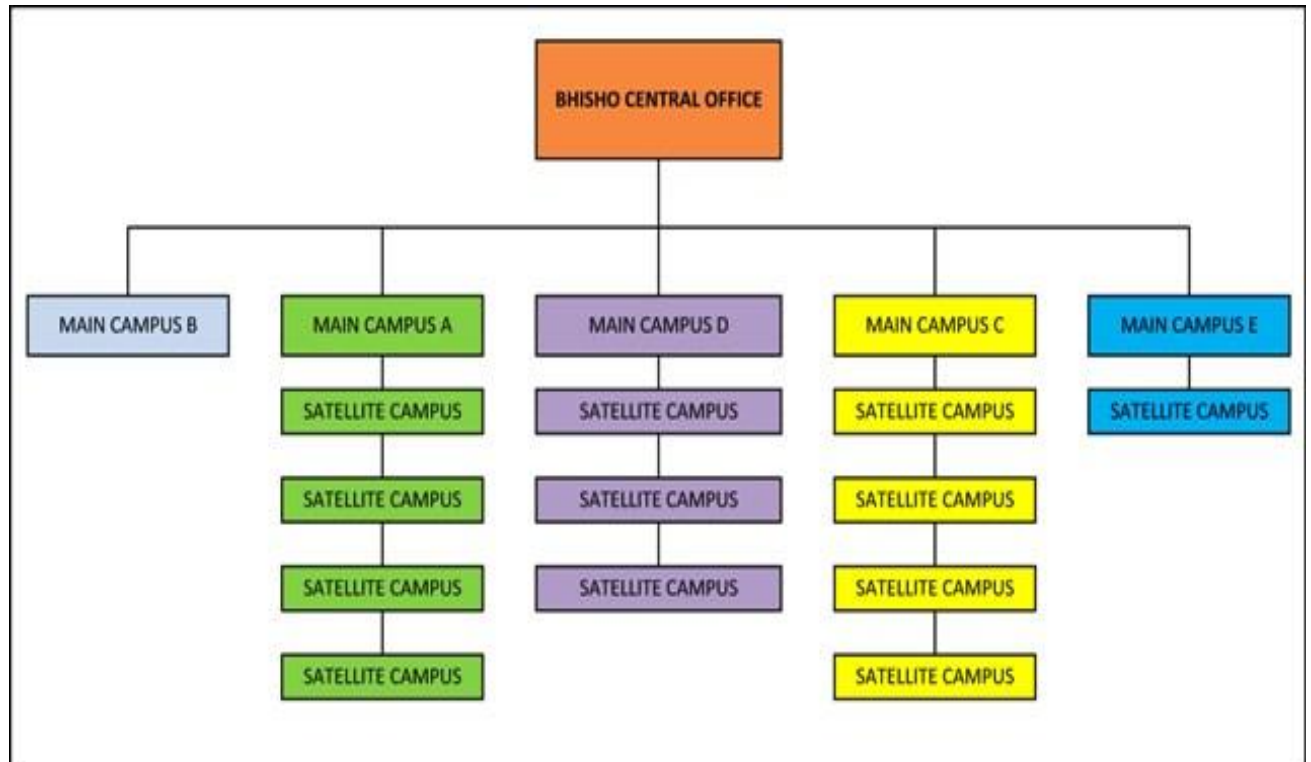


Figure 1.1: The NEI central office, main campuses and satellite campuses

Figure 1.1 indicates the NEI's Bisho central administration office, the main campuses and satellite campuses. Main campuses A and C both had four satellite campuses. Whilst main campus D had three satellite campuses and main campus E had one satellite campus. Furthermore, main campus B had no satellite campus. The distribution of the satellite campuses depended on the availability of nursing schools in the specific region.

Each of the five campuses had a campus head, deputy campus head, six subject heads and a number of nurse educators for the various subjects of the comprehensive four-year nursing programme and post-basic programmes. The main campuses also had support staff (NEI structure, 2005: [10]).

In Table 1.4 an indication of the staff composition, as well as the qualifications of academic staff of the specific NEI was provided.

Table 1.4: Staff composition of the nursing education institution

Academic staff	Number
Head of the Nursing Education Institution	1
Deputy head of the Nursing Education Institution	1
Registrar academic	1
Campus heads	4
Assistant managers	2
Programme managers	6
Deputy campus heads	5
Subject heads	26
Satellite heads	11
Nurse educators	159
Total	216
Qualifications of academic staff	
BA Cur degree	182
B Cur (I et A) degree	4
B Cur (honours)	15
Masters degree	14
PhD	1
Support staff	
Registrar Administration	1
Typist	15
Administration staff	48
Library staff	1
Drivers	12
Cleaning staff	65
Total	142

Adopted from (EC DoH 2010: 9).

As depicted from Table 1.4, one hundred and eighty six academic staff members had a basic degree, fifteen had an honour's degree, fourteen a master's degree and one campus head had a PhD.

The numbers of students for all the levels of each programme throughout the NEI campuses and satellite campuses were indicated in Table 1.5.

Table 1.5: Student numbers for different programmes

Programme:	Number of students:
Four year comprehensive	1929
Post-basic	220
Bridging	144
Enrolled nursing	676
Enrolled nursing assistant	211
Total:	3180

Adopted from (EC NEI, 2010: 10).

As depicted in Table 1.5 there were a total of 3180 students registered at the NEI in the EC province in 2010. The ratio of nurse educators to students from level 1 to level 4 for the theoretical and practical component was indicated in Table 1.6.

As indicated in Table 1.6, the average nurse educator to student ratio for the theory was 1:16 and the average nurse educator to student ratio for the practica was 1:12. The lower practical ratio was due to the appointment of forty six (46) clinical facilitators who were solely responsible for clinical accompaniment of students enrolled for the comprehensive four year programme.

According to the eBrief document (August 2010 No1) for the International Centre on Nurse Migration the acceptable nurse educator student ratio is 1: 25 for theory and 1: 8 for practical (eBrief, 2010: 1).

Table 1.6: Nurse Educators to student ratio

Level	Component	Ratio
Level 1	Theory	1: 12
	Practica	1: 7
Level 2	Theory	1: 12
	Practica	1: 7
Level 3	Theory	1: 8
	Practica	1: 5
Level 4	Theory	1: 8
	Practica	1: 6
Average nurse educator: student ratio Theory. 1: 16 Practica. 1: 12		

Adopted from (NEI, 2010: 10).

Although the ratios were depicted as internationally acceptable, there was a shortage of educators due to the distribution factors. That is some campuses had more educators than others. The ratios per level for both theory and practical appeared to be very low due to the overlapping of nurse educators at different levels. For example a nurse educator teaching community nursing science from first to third year level was counted throughout these levels. This double or triple counting of one nurse educator was applicable for all the subjects with some exceptions in two campuses. That was campus A and B where there are nurse educators that are solely responsible for one level. Therefore due to this counting of one nurse educator in two or three levels the ratios appeared quite reasonable when in actual fact the nurse educators were grossly over worked (NEI, 2009: 10).

1.6.3 Paradigm

A paradigm is the manner in which an individual sees the world. The meaning one gives to world issues would be influenced by his or her paradigm (Polit & Beck, 2008: 13). Two paradigms have been identified

by Polit & Beck. One is the positivist paradigm which states that all aspects that are in this world have some causes (Polit & Beck, 2008: 14).

On the other hand there is naturalistic paradigm which states that all world aspects are the construction of the people's minds and are therefore subjective. Because naturalists see the world as a human construction, it is also called the constructivist paradigm. Constructivists see the world realities as being continuously created by the various individuals participating in research. Therefore reality is a form of social constructivism. If realities are constructed by various social beings, multiple realities therefore exist. This constructivist paradigm is always associated with qualitative research (Polit & Beck, 2008: 15).

Constructivists in their research would deal with complex social phenomenon. These researchers would not attempt to reduce the complex reality (Polit & Beck, 2008: 17). In the context of this study the naturalistic (constructivist) paradigm was applied. This paradigm was applicable because of the complex nature of the challenge of performance in biological science. A number of stakeholders namely the nurse educators, managers and students are involved in the subject biological science.

1.6.4 Conceptual framework

The conceptual framework of this study would be based on the 5-D cycle of Appreciative Inquiry (AI) which involves asking positive questions to a group of stakeholders in order to craft and implement action plans towards excellence (Reed, 2007: 2).

Each of the components of the conceptual framework will be discussed briefly in Sections 1.6.4.1-1.6.4.4.

1.6.4.1 AI defined and described

Appreciative Inquiry is an inquiry that focuses on appreciating what works well (Reed, 2007: 2). Appreciative Inquiry is a form of an applied research aimed at making organisations more effective in their day to day activities through a process of positive consultation, intervention and transformation (Reed, 2007: viii). AI is therefore a group process that is used to positively challenge the existing assumptions of an organisation by asking questions about the strengths and successes of an organisation or a component of the organisation with the purpose of developing and implementing an improvement plan for the organisation or that component of the organisation (Preskill & Catsambas, 2006: 1).

Positive questioning is a must if we want to excel in this complex, unpredictable and challenging world. Asking energising, motivating questions that bring hope would lead to organisational learning, positive change and excellence (Preskill & Catsambas, 2006: 1).

Furthermore, no negative, condemning, fault finding and accusing questions should be asked (Preskill & Catsambas, 2006: 1). Appreciative Inquiry is a naturalistic way of inquiry aimed at addressing complex multidimensional aspects that could not simple be reduced into cause effect relationships. Appreciative Inquiry involves intense engagement with the participants (Reed, 2007: 1).

In the context of this study where there was a challenge in terms of academic performance of biological science; AI was used to ask questions about what works well for biological science. These questions were asked from the second year comprehensive four year nursing programme students registered for the subject biological science. The questions were based on the strengths and successes of biological science, with the aim of building future plans based on the wishes the participants had for the subject (Preskill & Catsambas, 2006: 1).

1.6.4.2 Appreciative Inquiry principles

The principles of AI are discussed in many texts, but they originated in the work of David Cooperrider's first description of AI (Reed, 2007:24). The principles of AI utilised in this study are discussed briefly.

⇒ Constructivists principle

This principle is about the different perspectives with which group members view the world. The group members share these different perspectives in order to construct a more enriched world. The conversation that takes place in our relations continually constructs our reality. This construction is based on the past, present and the future. In the context of this study the different perspectives of the study participants were used to construct the future of biological science (Reed, 2007: 26; Preskill & Catsambas, 2006: 10).

⇒ Principle of simultaneity

The principle of simultaneity when questions are asked about the organisational issues the group members simultaneously think of possible solutions to those issues. Asking questions stimulate thinking and immediately shapes actions. This would simultaneously stimulate change (Reed, 2007: 26; Preskill & Catsambas, 2006: 10).

⇒ Poetic principle

This principle is about people continuously writing their own important life stories in their minds. People have these stories engraved in their minds. One may here a person saying that she or he can write a story about the organisation. Therefore all the stakeholders of an organisation (internal and external) are continually co authoring stories about the challenges and successes of the organisation (Reed, 2007: 26; Preskill & Catsambas, 2006: 10).

Appreciative Inquiry assists people to engrave positive stories in their minds. In the context of this study, AI would assist the study participants to engrave positive stories about biological science. This would be done to remove the negativity brought about by the unsatisfactory outcomes of biological science (Reed, 2007: 26).

⇒ **Anticipatory principle**

This principle is about what people anticipate about the future which would in turn shape their future. Positive anticipation would therefore lead to a positive future. Appreciative Inquiry assists people to have positive anticipations despite the challenges of this complex world. Positive anticipation of the future leads to positive actions. Appreciative Inquiry in this study would help the study participants to have positive anticipations about biological science performance. That would then lead to a positive change (Reed, 2007: 27; Preskill & Catsambas, 2006: 10).

⇒ **Positive principle**

This principle indicates that positive attitudes and inspirations are enriching and nourishing physically and psychologically. When this principle is applied to an organisation it would lead to a healthy, productive and progressive organisation that is delivering on its mandates. Applied to the context of the study this means that the study participants would have that positive total well being and energy to succeed in biological science. That would ultimately lead to actual success (Reed, 2007: 27; Preskill & Catsambas, 2006: 10).

⇒ **Wholeness principle**

This principle is about positive involvement of all the stakeholders in AI in order to enrich the process of change. Wholeness brings out the best in people and organisations. Involving all of the stakeholders in a large group process would stimulate creativity and builds a collective capacity (Preskill & Catsambas, 2006:10; Sloan & Canine, 2007:4).

⇒ **Free choice principle**

This principle is about AI encouraging stakeholders to engage freely and set priorities for organisational way forward (Preskill & Catsambas, 2006: 11).

⇒ **Enactment principle**

This principle is about AI encouraging stakeholders to be actively involved in facilitating organisational change. In the context of this study the biological science stakeholders would be fully involved in the AI process in order to promote successful biological science performance (Preskill & Catsambas, 2006: 10).

1.6.4.3 Appreciative Inquiry assumptions

Assumptions, according to Polit and Beck (2010:14), refer to a basic principle that is believed to be true without proof or verification.

"Reality is created and there are multiple realities" In the context of this study AI would focus on drawing these multiple positive realities about biological science from the study participants (Reed, 2007: 28).

"The act of asking questions of an organisation or group influences the group in some way". No matter what challenges are facing us in this complex world, asking positive questions would positively influence us in some way. In the context of this study asking positive questions about biological science would influence thinking about positive ways of handling biological science (Reed, 2007: 28).

"People have more confidence and comfort to journey the future when they carry forward parts of the past". This means that linking unknown future plans to the currently known positives makes people more confident and comfortable to move forward (Reed, 2007: 28).

"If we carry parts of the past forward, they should be what is best about the past". This means that only the best should be carried forward (Reed, 2007: 28).

"It is important to value differences" The different point of views brought by the people must be valued. It is the different point of views that would bring about positive change (Reed, 2007: 28).

"The languages we use create reality" Positive language would therefore create a positive reality (Reed, 2007: 28).

1.6.4.4 AI cyclical process

The cyclical nature of AI indicates that it is a continuous process. It has a positive core in the centre. This positive core is the most important aspect of change management. The core is formed by the strengths, goals and achievements of the organisation or component of the organisation. The aim of AI is to build on the positive core (Reed, 2007: 32).

As seen in Figure 1.2, the 4-D cycle consists of a discovery, dreaming, designing, and delivery phases. The AI process also has a central positive core that is made up of strengths, goals, successes and acts of excellence (Reed, 2007: 32-33).

In this study the 4-D cycle would be utilised. In Figure 1.2 a schematic presentation of the 4-D cycle is provided.

A brief description of each phase will be provided in the sections following Figure 1.2..

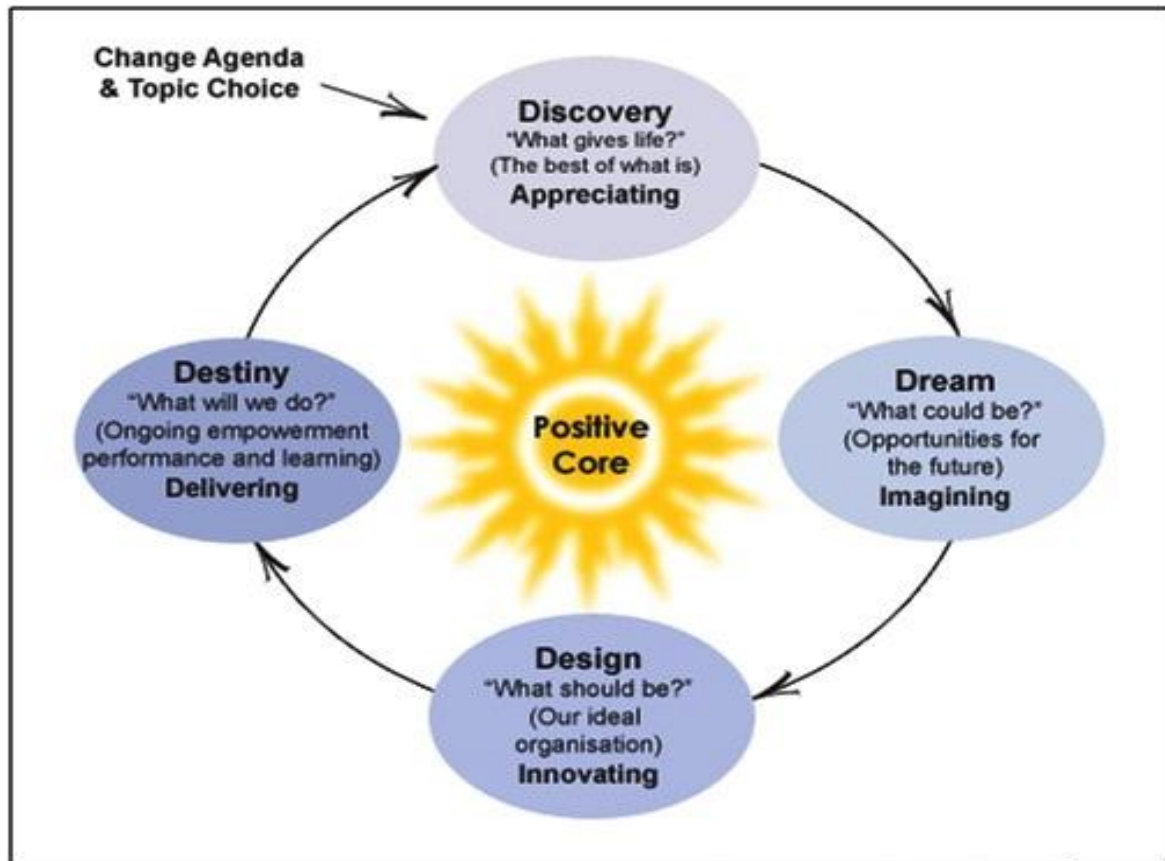


Figure 1.2: Appreciative Inquiry 4-D cycle.

<http://www.google.co.za/imgres?imgurl=http://www.tmiaust.com.au/i>

⇒ **Discovery phase**

The discovery phase is about discovering the positive aspects that keep us going in the organisation or component (Reed, 2007: 32). This phase is about the principle of asking positive questions that would simultaneously influence change (Reed, 2007: 27). Discovery is also about the AI assumption of asking questions about the organisation to discover what is best (Reed, 2007: 28).

In the context of this study, despite the challenges facing biological science the participants would be encouraged to discover what currently works the best pertaining to the subject biological science.

⇒ **Dreaming phase**

The dreaming phase involves an unlimited, creative big thinking about future plans based on the discovered positives (Reed, 2007: 33). According to the AI principle of simultaneity the dreaming and discovery phases occur simultaneously. This dreaming would be more effective when the unknown future is linked to the known current positives discovered during the discovery phase. Because this dreaming is a group effort, multiple positive dreams would come up. The assumption of valuing the different contributions made and the use of positive encouraging language would be critical for the success of this dreaming phase (Reed, 2007: 28).

In the context of this study the study participants would be encouraged to positively dream and envision the best possible future they have for biological science. In other words what do the students perceive to be the ideal circumstances to be academically successful in the subject biological science.

⇒ **Designing phase**

The designing phase involves designing inclusive future plans based on the multiple positive dreams and possibilities emerging from the dreaming phase. The study participants would be encouraged to include delivery plans for the designed plan (Reed, 2007: 33).

In the context of this study the designing phase would include a co-constructed action plan (recommendations) based on inputs from all the participants.

⇒ **Delivery phase**

The delivery phase is about the implementation of the co-constructed action plan (recommendations). What activities would be done, by whom and when in order for the plans to be realised (Reed, 2007: 33).

The recommendations made based on the findings of this study, will be forwarded to the relevant stakeholders for further inputs and consensus. *Please note: The inputs made by stakeholders is not part of the discussion of this study.*

1.6.5 Conceptual definitions

In the context of this research, and for simplicity and consistency throughout this dissertation, the conceptual definitions would be defined.

1.6.5.1 Biological Science

The term biology refers to the “*scientific study of living organisms*” (South African Pocket Oxford Dictionary, 2005: 79). Living organisms could be animals, plants, human beings, micro organisms and parasites. According to the Oxford Advanced Learner’s Dictionary, (2005: 136) biology is “the way in which the body and cells of a living thing behave”.

Biological science is “connected with the processes that take place within living things” (Oxford Advanced Learner’s Dictionary, 2005: 135). Pertaining to the comprehensive four year nursing programme biological science includes anatomy, physiology, chemistry, biophysics, microbiology and parasitology. All these subjects are studied in relation to the human body.

Biological science enables nursing students to understand the normal structure of the human body, its functioning, the relevant chemical and biophysical aspects of the body and aspects of the micro-organisms and parasites that could affect the human body (R425, 1994: 5).

For the purpose of this study biological science would refer to the subject that includes: anatomy, physiology, biophysics, chemistry, microbiology and parasitology which are studied on first and second year levels of the comprehensive four year nursing programme of the NEI.

1.6.5.2 Nurse educator

According to the Moby's Medical Dictionary (2009:[1]) a nurse educator is a registered nurse whose primary area of interest, competence and professional practice is the education of nurses at the university level.

The Free Dictionary (2009:[1]) defines a nurse educator as a nurse who prepares licensed practical nurses and registered nurses for entry into practice positions. Nurse educators also teach in graduate programmes at master's and doctoral levels and prepare advanced practice nurses, nurse educators, nurse administrators, nurse researchers, and leaders for employment in complex health care and educational organisations. Nurse educators practice at faculties in colleges, universities, hospital-based schools of nursing or technical schools, or as staff development educators in health care facilities. A nurse educator is also referred to as a lecturer, which "*means a person who teaches, educates and trains learners at the college*" (Act No 4 of 2003: 2).

For the purpose of this study a nurse educator would refer to a person with either a diploma or a degree in nursing education, and who is involved in the education and training of the comprehensive four year nursing programme at the specific NEI in the EC province.

1.6.5.3 Nursing education institution (NEI)

A nursing education institution is an institution that has been granted legal authorisation by the South African Nursing Council (SANC) to train a particular approved category of a nurse (Nursing Act no 33 of 2005: 5).

The Nursing Act no 33 of 2005 (Republic of South Africa 2005:6) defines a "*nursing education institution*" as any nursing education institution accredited by the SANC. According to the SANC Regulation R.425 (1) a

“*nursing college*” means a post-secondary educational institution which offers professional nursing education at basic and post-basic level where such nursing education has been approved in terms of section 15 (2).

For the purpose of this study the NEI would refer to a specific nursing education institution in the Eastern Cape Province where the comprehensive four-year programme for the training of professional nurses is offered.

1.6.5.4 Nursing programme

According to the Oxford advanced learner’s dictionary, “*nursing is the job or skill of caring for people who are sick or injured*”. This same dictionary on page 1161 refers to programme as “an intense training program”. Therefore a nursing programme would be a programme in which people are trained or educated for the purpose of caring for the sick or injured people.

A nursing programme in the South African context is any programme that is legalised by the SANC to be provided at a NEI. SANC does this legalisation as an accredited Education and Training Quality Assurance (ETQA) body. These programmes range from certificates, basic diplomas, post basic diplomas and degrees (SANC accreditation policy and procedure: [1]; SANC circular 3/2009: 1).

The nursing programme that would be the focus of this study is the comprehensive four year nursing programme which leads to registration as a nurse (General, Psychiatric and Community) and a midwife. as offered at the five main campuses of the NEI in the EC province (R425, 2001: 1).

1.6.5.5 Nursing student

A student is “a person studying at a university or college” (South African Pocket Oxford Dictionary, 2005: 903). A nursing student therefore is a person who is studying a nursing programme at a university or nursing college for the purpose of obtaining a nursing qualification.

According to the SANC a nursing student is referred to as a learner nurse. This is “a person undergoing education or training in nursing”. She or he must be registered with the SANC as a learner nurse (Act No 33 of 2005: 67).

A nursing student could follow anyone of the programmes accredited by the SANC if she or he meets the criteria for that programme. These programmes range from certificates, basic diplomas, post basic diplomas and degrees (SANC accreditation policy and procedure: [1]).

For the purpose of this study a nursing student would be a person who is registered for the comprehensive four year nursing programme at the NEI in the EC province (Act No 4 of 2003: 3).

1.7 SIGNIFICANCE

The shortage of nurses is a huge challenge for nurse managers who are unable to fill the vacant nursing posts. Moreover the nurses that are currently in service are ageing. They would therefore retire soon. Nurses that are on training are therefore the future of the nursing profession (Gaynor, Gallasch, Stewart & Tunner, 2006: 27).

It is therefore critical for the nurses in training programmes to complete their studies and qualify as professional nurses. In that way they would be

able to be employed in the vacant posts and alleviate the shortage of nurses (Together, 2007: [3]).

The unsatisfactory performance in biological science result to elongation of the period of training. Sometimes more serious consequences like nursing students having to leave the course without completing it do happen (Grizzell & McNeil, 2007, Gainor et al, 2006: 30).

Identifying the factors contributing to unsatisfactory academic performance in the subject biological science and making recommendations to the NEI and EC DoH for addressing the identified factors, could improve the output of professional nurses from the comprehensive four year nursing programme.

Therefore the results of this study would benefit the individual nursing student who will complete the course of training. It would also be beneficiary to the NEI for improving the pass rate. The EC DoH would also benefit from the economic use of the student's stipend. The entire public would benefit from the economic use of the tax payer's money. The public would also benefit from the availability of more professional nurses. There would be an improvement in the shortage of nurses in the clinical areas (Leech, 2010: 48).

As the challenge of academic performance in biological science is not only unique to the Eastern Cape, other nursing education institutions in South Africa could benefit from adapting and adopting the recommendations of this study and improving their pass rates and academic outputs as suggested by (Leech, 2010: 48).

1.8 RESEARCH DESIGN AND METHODS

The research design could be described as the overall plan for addressing the research question (Polit & Beck 2008:765). The choice of research

design should be the design most appropriate to the research question (Brink, 2006:118).

A research method is the manner in which a research study is structured. It would also involve the manner, in which the sample for the study is obtained, techniques that are used to gather and analyse the research data. (Polit & Beck, 2008: 15). This study will utilise a design that is qualitative, contextual, explorative and descriptive in nature.

1.8.1.1 Qualitative design

Polit and Beck (2008: 70) refers to qualitative research design as an emergent design that could emerge during the course of data collection. These authors further explained that an emergent design is a reflection of the researcher's desire to have an enquiry based on the realities and viewpoints of those under study.

Qualitative research is not reductionism; it promotes a greater depth for the understanding of social phenomenon. This greater depth could be achieved by promoting recall of past experiences through the use of strategies like the interviews (Berg, 2004: 2-3).

In this study a qualitative design would be appropriate, to explore and describe factors contributing to the academic performance of nursing students in the subject biological science.

1.8.1.2 Contextual design

In qualitative research designs the context in which the phenomenon is taking place would be crucial for its understanding. The meaning that is given to any experience could be understood when it is related to its context, be it a personal or a social context. This contextual based

understanding of a phenomenon is known as a contextual design (Terre Blanche & Durrheim, 2002: 125).

Contextual studies are conducted for the purpose of avoiding the separation of the phenomenon under study from its context (De Vos, 2001: 281). That is the context where the event is happening is of significance and of interest (Mouton, 2002: 133).

In the context of this study the context would be a specific NEI in the EC province. This would promote a contextual and holistic understanding that would promote the identification of the factors that influence the academic performance in biological sciences.

1.8.1.3 Explorative design

According to Polit and Beck (2008: 20) explorative research investigates the full nature of the phenomenon, the manner in which it is manifested, and the other factors to which it is related. "Explorative qualitative research is designed to shed light on the various ways in which a phenomenon is manifested and on underlying process" (Polit & Beck, 2008: 20).

The researcher would, by means of the AI approach explore the experiences of second year nursing students, pertaining to the factors contributing to the academic performance in the subject biological science.

1.8.1.4 Descriptive design

The exploration of a phenomenon would lead to straight qualitative descriptions. A descriptive design is a complete and accurate description of a research phenomenon by the research participants as they experience it (Struwig & Stead, 2004: 8). The phenomenon would be described as it is experienced through all the sense organs, which

“includes hearing, seeing, believing, feeling, remembering, deciding, evaluating, acting and so forth” (Polit & Beck, 2008:228). Descriptive studies would be powerful in describing the nature and intensity of a phenomenon (Polit & Beck, 2008:278). Descriptive exploratory designs are used more often and they would continue to be used in the future (Schneider, Whitehead, Elliot, Lobiondo-Wood & Haber, 2007: 117).

In this study the researcher would describe the factors influencing the academic performance of students in the subject biological science, based on the findings obtained from second year nursing students.

In Table 1.8 a summary of the research methods applied in this study is provided.

Table 1.8: Summary of the research methods

Population	Sampling	Sample	Data collection	Data analysis	Establishing trustworthiness
Second year nursing students studying biological science at all of the five campuses of the NEI in the EC at time of study (Section 3.3.1)	Non-probability-consecutive (Section 3.3.2)	429 Nursing students (Section 3.3.3)	1) Self-reported interview schedules 2) Field notes 3) Reflective diary (Sections 3.3.3.1 – 3.3.3.3).	Content analysis (Section 3.3.4)	Strategies used: Transferability Dependability Credibility Confirmability (Section 3.4)

As indicated in Table 1.8 the research methods of this study included the population identification, sampling, sample, the data collection and data analysis as well as the establishment of trustworthiness. An in-depth discussion of the research methods and applied strategies to enhance trustworthiness are presented in Chapter 3.

1.9. TRUSTWORTHINESS

Trustworthiness refers to the quality of the data presented in qualitative research; the data obtained must accurately reflect the experiences of the participants. According to Lincoln and Guba (cited in Polit & Beck, 2008:196), trustworthiness covers aspects like “*credibility, transferability, confirmability, dependability and authenticity*” of the study results.

Credibility means that the study results should be a true representation of the phenomenon under study. Dependability is about getting consistent and accurate results. Confirmability refers to the data being confirmed as a true reflection of the information that was presented by the study participants. Transferability means that the results of the study could be applicable to other different settings. Authenticity refers to a research report that shows the diversity that was portrayed by the study participants (Polit & Beck, 2008:539-540).

In Table 1.9 a summary of the strategies implemented to enhance trustworthiness in this study is presented.

Table 1.9: Summary of the strategies implemented to enhance trustworthiness

Strategy	Action	Application criteria
Transferability	Thick descriptions	Thorough description of the introduction, background, problem statement, research question, aim and objectives, frame of reference and method (Sections 1.1 to 1.8)
Dependability	Space triangulation	Data was collected from the five campuses of the NEI (Section 3.3.3)
	Time triangulation	Data was collected from the five campuses at different times (Section 3.3.3)
	Method triangulation	Self-reported narrative appreciative interview schedule, field notes and reflective diaries were used (Sections 3.3.3.1 to 3.3.3.3)
Credibility	Prolonged engagement	Collection of data from the second year nursing students of all the five campuses of the NEI (Section 3.3.3)
	Thick descriptions	Thorough description of the content analysis process (Section 3.3.4) Direct quotes from the second year nursing students included in the report (Section 4.2)
Confirmability	Thick descriptions	Direct quotes from the second year nursing students included in the report (Section 4.2)
	Coder triangulation	Data collection records were also analysed by a co-coder (Section 3.3.4.2)
	Inquiry audits	Discussion of the emerging themes, categories and sub-categories with the co-coder (Section 3.4)
	Peer review and debriefing	The emerging themes, categories and sub-categories were presented and discussed with the supervisor and co-supervisor (Section 3.4)

As seen in Table 1.9 different strategies were used to enhance trustworthiness in this study. These strategies were applied in the various sections as indicated in Table 1.9 and are discussed in Section 3.4, of Chapter 3.

1.10. ETHICAL CONSIDERATIONS

Ethics is about moral values that must be observed when conducting research. It also entails protection of human subjects during the study (Joubert & Ehrlich, 2009: 30-31). Honesty and integrity should be maintained through out the research project (Burns & Grove, 2009: 184).

A number of procedures should be observed by researchers in order to conduct ethically sound studies. These procedures would include risk benefit assessment. This involves assessing whether the risks of the study are minimal or not. If the risks are more than minimal, extra precautions must be taken by the researcher to protect the study participants. These risks may be monetary, psychologically, physically and social (Polit & Beck, 2008: 174 – 175).

Study participants should sign a informed consent form before embarking on the study. The study information should be explained to them so that they make an informed decision whether to sign or not to sign the consent form (Polit & Beck, 2008: 176). Researchers should also be authorised in writing to access institution health records if their study involves that (Polit & Beck, 2008: 178).

Researchers should observe the confidentiality procedures during the study. Sapsford and Abbott in (Bell, 2010: 49) define confidentiality as an assurance to the study participants that they would not be presented or dealt with in a recognisable form. That is any data that is obtained must be treated confidentially. It must be explained to the study participants whether confidentiality would involve anonymity or not (Polit & Beck, 2008: 180). Anonymity according to the South African pocket Oxford dictionary is a state of not making the name known. Therefore no individual or institution name must be revealed (Bell, 2010: 51).

Study participants should be allowed to ask questions and share their concerns in a debriefing session after the data collection process. This

would allay any anxieties that developed during the data collection process. Researchers should always interact with study participants in a respectful manner. They could also share the study results with the participants when the report is written. This report could be mailed to them or the participants could be referred to a relevant website (Polit & Beck, 2008: 182).

It is essential that vulnerable groups are protected during a research study. These groups include children, pregnant women, mentally disturbed, very ill and institutionalised individuals (Polit & Beck, 2008: 182 – 183).

Researchers should submit their research proposals to external review boards before conducting the research. These boards ensure that quality research of a high standard is conducted (Bell, 2010: 47). They also ensure that human rights are protected during the research process (Polit & Beck, 2008: 184).

In the study that will be conducted by the researcher, the study participants, the NEI and the EC DoH would benefit from the recommendations of the study when the performance in biological science improves. A minimal emotional risk could prevail during the data collection process since the students are afraid of the subject biological science. The benefits of this study would outweigh this minimal risk (Polit & Beck, 2008: 170).

Permission to conduct the research would be requested from the EC DoH and NEI head in writing. Both the EC DoH and NEI head would be given the research proposal. Authority to access the research setting and participants would also be requested. The proposal would also be presented to the ethics committee of the health science department of the University of Pretoria (Polit & Beck, 2008: 184).

The researcher would explain all the aspects of the study to the prospective participants. This explanation would be done by going through the proposal. After this explanation the participants would be given an opportunity to choose whether to participate or not to participate in the study. (Polit & Beck, 2008: 171-172). When they agree to participate they would be given a consent form to sign (Polit & Beck, 2008: 177).

The prospective participants would be assured that any information that they provide would be treated with strict confidence. No names or student numbers would be revealed in the report (Polit & Beck, 2008: 180).

After data collection the participants would be given an opportunity to ask questions and share their concerns. This would give the researcher an opportunity to allay any anxieties that occurred during the data collection process. The research results would also be shared with the participants in a confidential manner (Polit & Beck, 2008: 182).

1.11. LIMITATIONS

Any limitation that occurred during the study should be considered during the interpretation of the findings of the study. It must therefore be reported (Polit & Beck, 2008: 74).

In the context of this study the researcher could have a challenge of getting the study participants if the data collection time coincides with examinations. That could result to inadequate samples of nursing students. The consecutive sample of second year nursing students who were successful and unsuccessful in biological science would not be representative if the students are not available (Polit & Beck, 2008: 344). Therefore data collection should be done at a period that is outside the examinations.

One limitation of self reported interviews could be participants who are not open to sharing the information holistically. This would lead to the researcher getting limited biased information. In order to overcome this bias the interviewer should establish rapport and trust with the interviewee as suggested by (Polit & Beck, 2008: 400).

The interview topic about biological science experiences could result to strong emotions for those nursing students who had unsatisfactory outcomes of biological science. The researcher should be prepared to handle such emotions or else they could interfere with the quality of the interview data as indicated by (Polit & Beck, 2008: 400).

In this study the first 3-D of the 4-D cycle will be utilised to base the recommendations on for the final stage of the 4-D cycle. In reality the 4th D of the 4-D cycle realised but was not written up as part of this study.

1.12. LAYOUT OF DISSERTATION

The layout of the study is as follows:

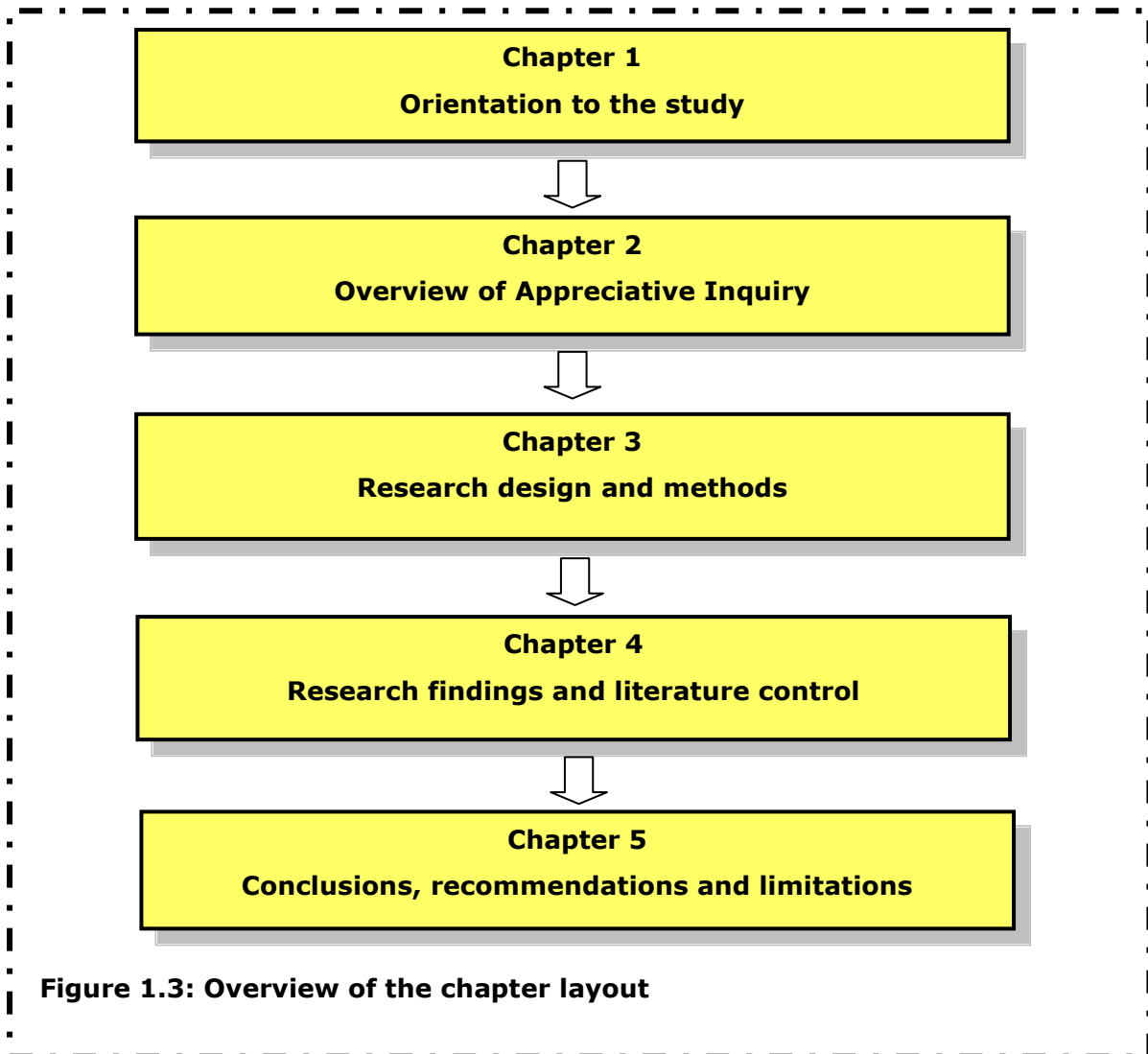


Figure 1.3: Overview of the chapter layout

1.13. CONCLUSION

In this chapter an orientation to this study was provided which gave the background, aim and objectives of this study and even the layout of the entire dissertation. This chapter also presented the researcher's frame of reference, research method and ethics. Trustworthiness and an in-

overview of study limitations were provided. In Chapter 2 an in-depth overview of Appreciative Inquiry (AI) as the framework of this study are delineated.

2 OVERVIEW OF APPRECIATIVE INQUIRY

2.1 INTRODUCTION

An orientation to this study was presented in Chapter 1. In this chapter Appreciative Inquiry (AI) would be discussed systematically in terms of the historical overview, description, propositions, principles, benefits, 5-D cycle, 4-I cycle, organisational change, importance of questions in AI as well as evaluation in AI.

The rationale for this chapter is to orientate the reader to AI, as this is a relative new approach in nursing research in South Africa.

2.2 HISTORICAL OVERVIEW

Appreciative Inquiry originated in 1980 from David Cooperrider's doctoral programme at the Cleveland clinic project. Cooperrider was studying at the Case Western Reserve University. Suresh Srivasta who was Cooperrider's doctoral advisor encouraged him to go on with his AI project. Cooperrider whilst studying the human aspects of the Cleveland clinic, observed that the clinic employees were working together positively in establishing new developments. David Cooperrider was given permission to focus on the life giving factors that contributed to the success of the clinic. The Cleveland clinic was the first site where focusing on life giving factors was the basis of organisational analysis (Knell, 2010: 2; Watkins & Mohr, [ND]: [1]; Whitney & Trosten-Bloom, 2010: 78).

In 1986 Cooperrider's AI emerged as an organisational change strategy. Since then a number of publications have been made about AI and

organisational change. Today AI is not just viewed as a method but as a paradigm shift of the 21st century. Since 1986 AI has been utilized in a number of organisations to bring about positive change. Appreciative Inquiry has been used in the business, educational, governmental and religious institutions with great success (Fry, Barret, Seiling & Whitney, 2002: 4; Watkins & Mohr, [ND]: [2]; Whitney, 2010: 1).

2.3 DESCRIPTION

Appreciative Inquiry is an approach to organisational change that focuses on doing more of “what is working well”. Appreciative Inquiry inquires about existing excellences and solutions with the purpose of maximising them to the future. The assumption is that in every organisation there is something that is working well which, and if maximised it can lead to excellent organisational change (Hall & Hammond, [ND]: 2-3).

Appreciative Inquiry is a team approach for inquiring about the best, the strengths, what is giving life and what is working well in big and small organisations. Appreciative Inquiry can be used in components and subcomponents of an organisation. Therefore in AI change must be brought about collectively through capturing the best moments of the group or the organisation. The focus of AI is on addressing complex multidimensional aspects that can not be reduced into cause effect relationships. Appreciative Inquiry involves intense engagement with the participants (Cooperrider, Whitney & Stavros, 2008:3; Reed, 2007: 1).

Appreciative Inquiry can also be used as a strategy for change even in education to “enhance student outcomes”. That is it can also bring about innovations in education. Therefore AI can be used as a valuable tool in teaching and learning. Appreciative Inquiry can be used to improve student success in educational programmes (Davis, 2005: [2]; Willoughby & Tosey, [ND]: 5).

Data about the strengths and positives of the organisation is collected through interviews and story telling. The data is about “what is best” about the past and the present. Future organisational changes are crafted based on the collected data. Cooperrider et al. (2008: 4); Preskill & Catsambas (2006: 1) are of the opinion that positive questioning is a must if organisations and individuals want to excel in this complex, unpredictable and challenging world.

The founder of AI and his colleagues developed a 4-D model for implementing AI (Preskill & Catsambas, 2006: 15). This model was later developed into a 5-D model and would be discussed in section 2.7 of this chapter.

2.4 UNDERLYING PROPOSITIONS

In view of Brainy quote (2011: [1]) a proposition is something that is offered so that it can be agreed upon or accepted. It is a statement about the truth that must be demonstrated. Propositions must be provocative by challenging the status quo and existing assumptions of an individual or an organisation. “A provocative proposition is a statement of what an organisation aspires to be and to do to accomplish its dream”. Provocative propositions therefore would enhance the realisation of the organizational vision. Appreciative Inquiry for example challenged the mindset of identifying problems for organisational change to a mindset of identifying “what is working well” in organisations. When establishing provocative challenging statements, the stakeholders should be in new groups. They should focus on new bold positive topics. They should rephrase and refine their ideas (Cooperrider, 2002: [1]); Ludema, Whitney, Mohr, & Griffin, 2003: 183).

Inquiries about organisational performance should always be appreciative. That is organisations should be viewed with an admiring and advocating mindset. To appreciate means recognising and valuing what is best in

organisations and its people. To inquire means asking questions. Therefore the inquiry should be about what gives life and what makes people excel in their work. The inquiry should result to information that can be applied for positive future changes (Cooperrider et al. 2008: 4; Kelm, 2006:7).

The strength based inquiry should be provocative. That is the inquiry should provoke the members to take action because any organisation has the potential to be more than what it is at a given moment. The inquiry should always be collaborative, involving all relevant stakeholders (Cooperrider et al. 2008: 4).

2.5 CORE PRINCIPLES

There were five original principles in David Cooperrider's original book. These were constructionist, simultaneity, anticipatory, poetic and positive principles. (Watkins & Stavros, 2010: 7). Diana Whitney and Amanda Trosten-Bloom extended the five principles to eight from their application of AI and as a continuation and further development of the AI process. The additional principles include the "wholeness principle" which emphasises the importance of working together so as to achieve more. The other two additional principles are "free choice and enactment principles" (Preskill & Catsambas, 2006: 9; Watkins & Kelly, 2010: 12; Whitney & Trosten-Bloom, 2010: 51-52).

Each of these eight principles would be discussed in detail in Sections 2.5.1 to 2.5.8.

2.5.1 Constructionist principle

The constructionist principle is about the different perspectives with which the group members view the world. The group members share these

different perspectives in order to construct a more enriched world. This construction is based on the past, present and the future (Preskill & Catsambas, 2006: 10; Reed, 2007: 26). The reality is constructed from the positive communication and stories shared by the group members (Kerka, 2003: 1).

Organisational leaders and all the stakeholders must constantly inquire about the organisation. This inquiry could be in the form of needs analysis, strategic planning analysis, assessments, audits and performance appraisals. This continuous positive learning would result in the construction of a better organisation (Cooperrider & Whitney, 2005: 14). Organisations are seen as having endless constructive capacity (Cooperrider, 2005: 2).

2.5.2 Principle of simultaneity

The principle of simultaneity views inquiry as change (MacCoy, 2006: [5]). Positive inquiry and change occur simultaneously. The dialogue that is going on would result to some form of change. A positive congruent inner dialogue is crucial for organisational progress (Cooperrider & Whitney, 2005: 15). When questions are asked about the organisational issues the group members simultaneously think of possible solutions to those issues. Asking questions stimulate thinking and immediately shapes actions (Preskill & Catsambas, 2006: 10; Reed, 2007: 26).

2.5.3 Poetic principle

The poetic principle is about people continuously writing their own important life stories in their minds. One may here a person saying that she or he can write a story about the organisation. The life of the organisation is depicted in the stories shared by the stakeholders of the organisation. Therefore all the stakeholders of an organisation are continually co authoring stories about the challenges and successes of the

organisation. Human organisations are open books which are continuously written by those involved in the organisation (Bushe & Kassam, 2005: 166; Cooperrider & Whitney, 2005: 16). Appreciative Inquiry assists people to engrave positive stories in their minds (Preskill & Catsambas, 2006: 10; Reed, 2007: 26).

2.5.4 Anticipatory principle

The anticipatory principle is about what people anticipate about the future which would in turn shape their future. Positive anticipation would therefore lead to a positive future. That is our present actions are guided by the images we hold about the future. Appreciative Inquiry assists people to have positive anticipations despite the challenges of this complex world. Positive anticipation of the future leads to positive actions (Bushe & Kassam, 2005: 167; Preskill & Catsambas, 2006: 10; Reed, 2007: 27). The stakeholders of the organisation should have positive images about the future of the organisation. That is they must have positive future projections about the organisation (Cooperrider & Whitney, 2005: 16).

2.5.5 Positive principle

The positive principle indicates that positive attitudes and inspirations are enriching and nourishing physically and psychologically. Therefore focusing on the positives and feeling positive lead to more positives. When the positive principle is applied to an organisation it leads to a healthy, productive and progressive organisation that is delivering on its mandates (Preskill & Catsambas, 2006: 10; Reed, 2007: 27). Organisations progress when the stakeholders admire and are inspired by each others contribution (Cooperrider & Whitney, 2005: 17). Positive thinking and a positive organisational environment would build and sustain the rate of change. That is the more the change is guided by positivity, the more it would be long lasting and effective (Bushe, 2010: 2; Donnan, 2005: 1; Kelm, 2006: 5).

2.5.6 Wholeness principle

The wholeness principle is about positive involvement of all the stakeholders in AI in order to enrich the process of change. Wholeness brings out the best in people and organisations. Involving all of the stakeholders in a large group process stimulates creativity and builds a collective capacity (Preskill & Catsambas, 2006:10). The involvement of the stakeholders promotes a deeper and richer understanding. It promotes seeing the big picture. Therefore according to this wholeness principle all stakeholders and organisations are interconnected and they form part of a bigger whole (Kelm, 2006: 6; Positive engagement, 2011: 5). Wholeness therefore enlarges the way we see the world. Figure 2.1 below is a diagrammatic illustration of the enlargement of the world through the wholeness principle.

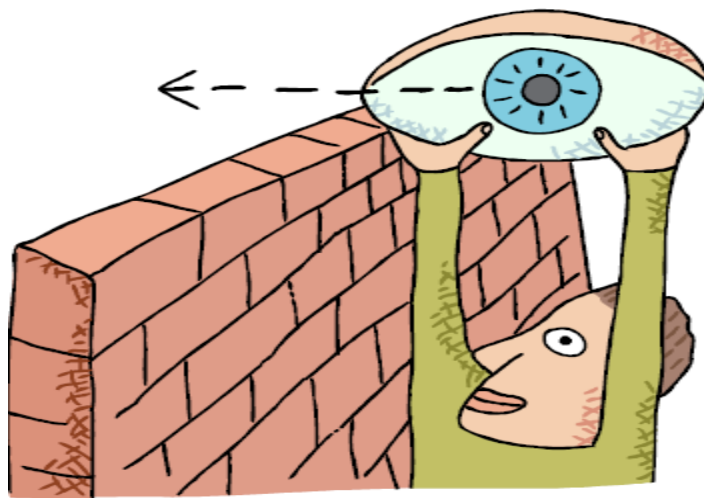


Figure 2.1: The wholeness principle enlarges the way we see the world (adopted from MacCoy, 2006: [9]).

As seen in figure 2.1 the wholeness principle through the involvement of the organisational stakeholders promotes seeing the bigger picture.

2.5.7 Enactment principle

The enactment principle is about AI encouraging stakeholders to be actively involved in facilitating organisational change (Preskill & Catsambas, 2006: 10). For change to occur in organisations the stakeholders need to be positive change agents. That is something must be done and that something must be positive. The change that is required would be accelerated if the stakeholders think and act in the direction of that change. Positivity on its own is not sufficient; it must generate action (Bushe, 2010: 1; Kelm, 2005: 1).

2.5.8 Free choice principle

The free choice principle is about AI encouraging stakeholders to engage freely and set priorities for organisational way forward (Preskill & Catsambas, 2006: 11). When these stakeholders are given the opportunity to freely and positively contribute towards organisational development, the organisation and its personnel flourish. That is this freedom “liberates both personal and organisational power” (Metzger & Dolezar, [ND]: [3]). The free choice therefore “stimulates organisational excellence and positive change” (Pratt, 2010: 1).

2.6 ASSUMPTIONS

Assumptions, according to Polit and Beck (2010:14), refer to a basic principle that is believed to be true without proof or verification. According to the free dictionary, an assumption is “the act of taking action or asserting a claim” (The free dictionary, 2011: [1]).

“Reality is created and there are multiple realities”. Appreciative Inquiry focuses on drawing these multiple positive realities from the stakeholders and building the future of the organisation on them (Davis, 2007: 1;

Reed, 2007: 28). Stakeholder involvement would therefore promote collective capacity and would stimulate creativity (Knell, 2010: 3).

"The act of asking questions of an organisation or group influences the group in some way". No matter what challenges are facing us in this complex world, asking positive questions would positively influence us in some way (Reed, 2007: 28).

"People have more confidence and comfort to journey the future when they carry forward parts of the past". This means that linking unknown future plans to the currently known positives makes people more confident and comfortable to move forward (Reed, 2007: 28).

"If we carry parts of the past forward, they should be what are best about the past". This means that only the best should be carried forward (Reed, 2007: 28).

"It is important to value differences". The different point of views brought by the people must be valued. It is the different point of views that would bring about positive change (Reed, 2007: 28).

"The language we use create reality". Positive language would therefore create a positive reality (Knell, 2010: 2; Reed, 2007: 28). Organisational stakeholders need to learn and practice to talk about what is right and positive in the life of the organisation even when there is some negativity. Try to see and talk about the positive out of the seemingly negative situation. The more positive the language the more positive would be the present and future actions. Positive language has a multiplying effect on actions (Kelm, 2006: 6; Knell, 2010: 2).

"Organisations are heliotropic". This is a phrase about plants that tend to grow towards sunlight which is their source of energy. This is also true about organisations as they tend to grow towards their source of energy. Appreciative Inquiry therefore focuses energy towards successes and

positive aspects hence it promotes positive organisational development (Branson, 2007: 2).

2.7 FIVE D-CYCLE

The AI process of David Cooperrider started off as the 4-D cycle. That is the continuous affirmative process was discover, dream, design and destiny. The organisational development practitioners in their use of the AI process included a fifth D to the 4-D cycle. The fifth D stands for "Define" and is at the beginning of the 5-D cycle. The 5-D cycle is thus define, discover, dream, design and destiny (Watkins & Stavros, 2010: 3).

In Figure 2.2 a schematical presentation of the 5-D cycle is presented. Each of the components of the cycle would be discussed in depth in Sections 2.7.1 to 2.7.5.

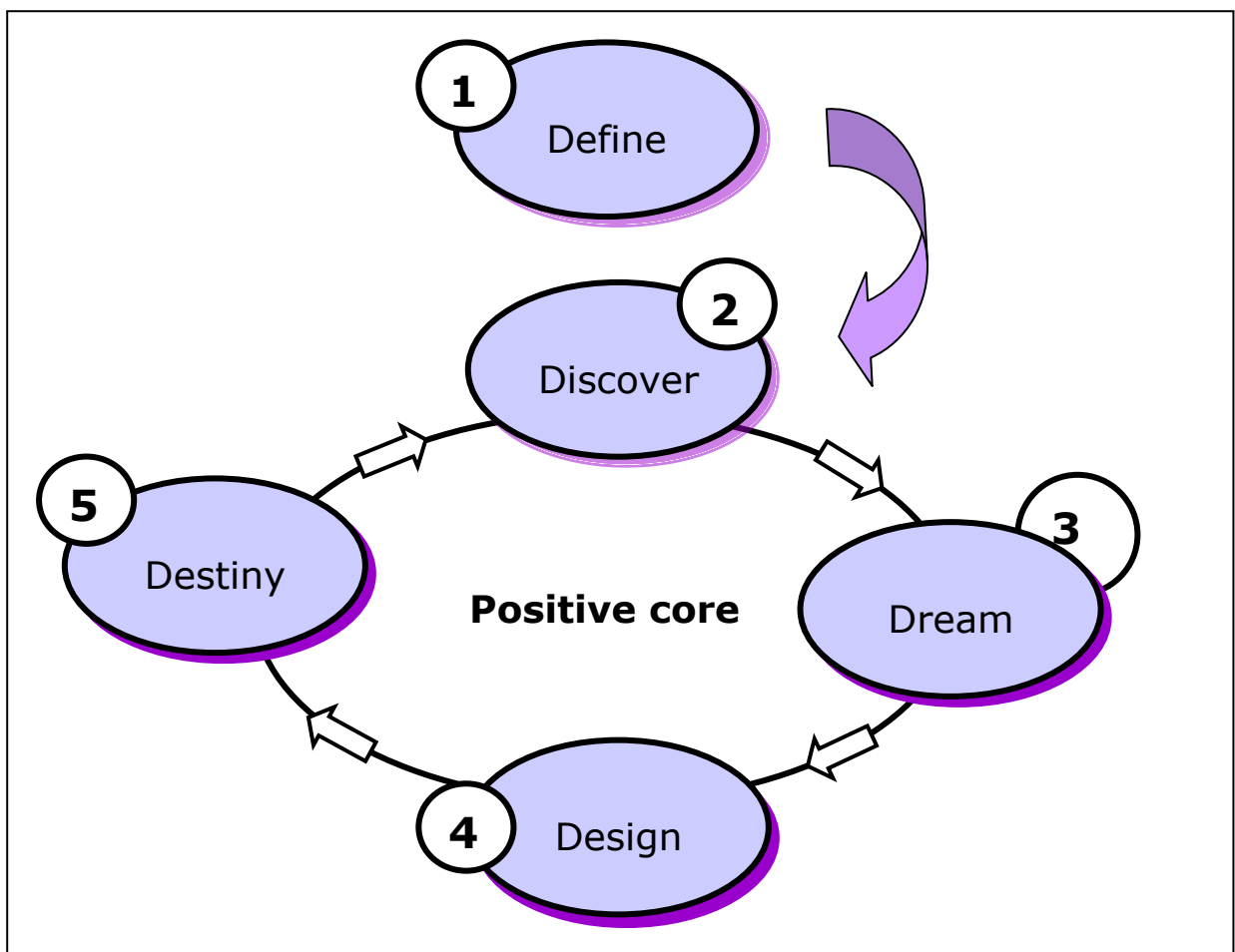


Figure 2.2: Appreciative Inquiry 5-D cycle (adopted from Cooperrider et al. 2005: 5)

2.7.1 Defining the challenge

The Appreciative Inquiry process is commenced by defining the challenge. The AI participants get into a contract by clarifying the process of the inquiry that would be followed (Watkins & Stavros, 2010: 3). The defined process would include introduction of AI to the participants. The supporting structure of the participants is also defined. An interview guide is created and a plan is crafted for the interview process (Watkins & Kelly, 2010: 23).

The point of departure during this phase is the choice of an affirmative topic. Participants must be guided towards choosing a positively framed topic. The affirmative topic could cover any aspect of the organisation. These could be aspects like leadership, finance, human resource issues and other organisational issues (Cooperrider & Whitney, 2005: 5). Even if there are negative feelings about some organisational aspects the participants must be encouraged to make sense of those aspects in a positive manner. Everybody wants something positive. Negative feelings therefore are an indication that one is not focusing on what she or he wants, that is the positive (Kelm, 2006: 7).

2.7.2 Discovering the best of “what is?”

During this phase AI promotes the discovery of the strengths, passion, innovations and living values of the organisation. It promotes discovery of the untapped and unexplained potentials of an organisation. All the stakeholders must share the stories that made them effective and successful (Cooperrider & Whitney, 2005: 7).

The discovery of the potentials and successes could be achieved through the use of appreciative interviews. This could for example be achieved by commencing with a review of successes and their causes. Having sessions for sharing stories of what makes the organisation successful. That is stories about the best experiences of the members in relation to the focus of inquiry (Bushe & Kassam, 2005: 167; Cooperrider & Whitney, 2005: 14). This would promote discovery of personal and organisational strengths (Cooperrider & Whitney, 2005: 26).

2.7.3 Dreaming “what could be?”

Every innovative organisation or action starts as a thought or a dream. We often find ourselves energised by words like “I have a dream” (Cooperrider, 2001: 4). The dreaming phase involves an unlimited, creative big thinking about future plans based on the discovered positives (Reed, 2007: 33). Because this dreaming is a group effort, multiple positive dreams would come up. The assumption of valuing the different contributions made and the use of positive encouraging language is critical for the success of this dreaming phase (Reed, 2007: 28).

What was discovered is put into constructive use. A strategic focus is unanimously established for a better future of the organisation. The agreed strategic focus or dream is made up of a great sense of purpose and a vision for a better future (Cooperrider & Whitney, 2005: 9-10).

2.7.4 Designing “what ought to be?”

The design phase involves designing inclusive future plans based on the multiple positive dreams and possibilities emerging from the dreaming phase (Reed, 2007: 33). A design of a better organisation is planned through maximizing the strengths and successes that were put together during the dreaming phase (Cooperrider & Whitney, 2005: 9-10).

2.7.5 Delivering “what will be?”

The fifth phase of the AI cycle was called delivery. The term delivery was replaced with destiny since delivery was limited as it did not focus to the future. Delivery is about present performance. Destiny on the other hand is a future directed implementation process. Destiny focuses on an organisation that is prepared to learn continuously in rendering a shared service (Cooperrider & Whitney, 2005: 11).

2.8 FOUR I-CYCLE

Later other AI practitioners developed a 4-I model for implementing AI. Before commencing the 4-I cycle AI is introduced to the stakeholders. The stakeholders must then decide on the focus of the project and develop a working strategy. This is known as the initiation of the AI project (Coghlan, Preskill & Catsambas, 2003: 12). Figure 2.3 presents a schematical presentation of the 4-I cyclical model.

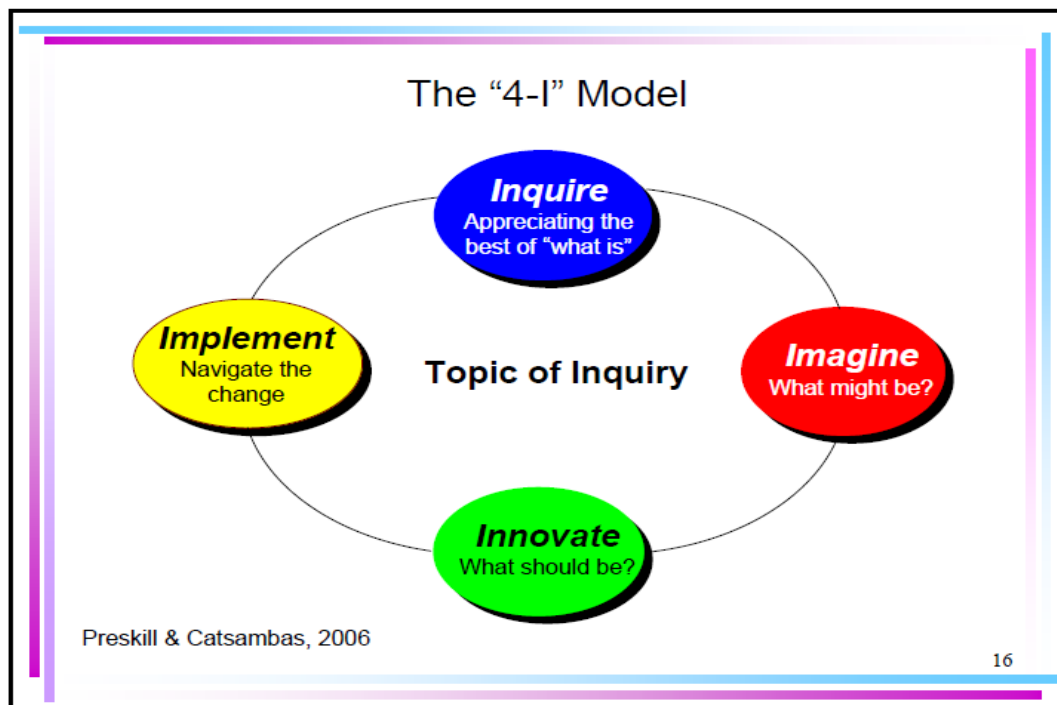


Figure 2.3. Appreciative inquiry 4-I cycle (adopted from Preskill, 2007: 8).

The 4-Is of the model in figure 2.3 are inquire, imagine, innovate and implement and are discussed in Sections 2.8.1 to 2.8.4.

2.8.1. Inquire

The inquiry is in the form of interviews about the stakeholder's best and valuable experiences about themselves and the programme. The participants are organised in pairs with people they are not familiar with. In those pairs of unfamiliar individuals sharing of best experiences, values and wishes is done. The inquiry of these valuable experiences and successes is essential for the development of the programme or the organisation. The inquiry must take place in a relaxed environment that is not threatening (Preskill & Catsambas, 2006: 16).

2.8.2 Imagine

The stakeholders must imagine an excellent future of the programme based on the valuable experiences and themes identified from the inquiry phase. That is they imagine "what might be". They develop a future vision and provocative plan of the organisation or programme. They could do this imagining as individuals, small groups or the entire group if it is a small group. The stakeholders are encouraged to discuss, write and even draw their ideas. These activities promote creativity among the stakeholders (Preskill & Catsambas, 2006: 20).

2.8.3 Innovate

The agreed upon vision is translated into an operational plan which must be put into action by the organisational stakeholders. At this stage it is clear to the stakeholders that change must occur. That is there is absolute clarity as to "what should be". The innovative plan is developed from the discovered successes, positives and the shared vision. This plan should exceed the obvious activities to include among others social processes like

the culture of the organisation, business processes, leadership, education and training (Preskill & Catsambas, 2006: 20; Preskill, 2007: 10).

2.8.4 Implement

The implementation phase is about the organisational stakeholders implementing the innovative plan developed during the “innovate” phase. The stakeholders should prioritise the issues for implementation. They should also decide on how, where and by whom the implementation of the various aspects would be done. The stakeholders should work hard towards the realisation of their organisation or programme’s vision. The progress towards the realisation of the vision is continuously monitored (Preskill & Catsambas, 2006: 22; Preskill, 2007: 10).

2.9 TRADITIONAL - VERSUS APPRECIATIVE EVALUATION

In traditional evaluation questions are asked about the problems of the organisation. The focus is on what is wrong in the organisation and who must be blamed. Adams, Schiller and Cooperrider, (2004:111) view this as a “judger mindset”. Inquiry is about the causes of the deficits. The belief is that if these deficits are fixed, then the whole organisation would be fixed. Traditional evaluation therefore focuses on solving problems. Energies therefore are focused on what is not required and this is demoralising (Preskill, 2007: 7; Serrat, 2008: 1).

Appreciative evaluation on the other hand focuses on the causes of success. Appreciative evaluators inquire about pockets of excellence within the organisation so as to build on them. They focus on what is right and working well with the view of further increasing it (Donnan, 2005: 1; Koster & Lemelin, 2009: 258; Preskill, 2007: 7). Adams et al, (2004: 111) views this type of evaluation as a “learner mindset”.

Both the judger and learner mindsets could be present in an individual or organisation with one model implicit and the other explicit. An awareness of these two models promotes introspection. Individuals and even organisations need to strive towards the “learner model” which promotes positivity and openness to possibilities (Adams et al. 2004: 111-112).

Tables 2.1 and 2.2 are a summary of the differences between traditional and appreciative evaluation which would be discussed in detail in Sections 2.9.1 and 2.9.2.

Table 2.1. Meaning of SWOT and SOAR

Traditional evaluation	Appreciative evaluation
S - Strengths	S - Strengths
W - Weaknesses	O - Opportunities
O - Opportunities	A - Aspirations
T - Threats	R - Results

(Sources: Businessballs (2011:6-7); Silbert & Silbert (2007:2)).

Table 2.1 reflects the differences between traditional evaluation and appreciative evaluation principles.

Table 2.2. Differences between the SWOT and SOAR approach.

SWOT	SOAR
Mixes positive (strengths and opportunities) with negative aspects (weaknesses and threats) from inside and outside.	A purely positive approach that is based on Appreciative Inquiry.
The mixing of positives and negatives decreases the positive thinking ability by creating doubts.	The purely positive approach is inspiring and energizing.
There is continuous “analysis of what is wrong”.	There is continuous search for positives, assets and strengths.
It is a top down approach where the	It is a “whole system” participative

plenary sessions are attended by senior members only.	approach to planning which involves all the stakeholders.
Managers and some external consultants decide on behalf of the employees.	Representatives of all the stakeholders responsible for or who would be affected by the change are involved.

Sources: Evolutionary sustainability (2007:2); Ludeman (2001:4); Preskill & Catsambas (2006:27); Silbert & Silbert (2007:1-2).

SWOT	SOAR
The implementers of the plan are not part of the planning process.	The implementers form part of the planning process and therefore there is collective approval of the plan.
Promotes mistrust of senior members by the employees and customers.	Promotes a trusting relationship between senior members, employees and customers.
The created vision is not shared by leaders and the entire staff.	A shared vision is developed from the active participation of all the stakeholders.
The implementers may be resistant and lack commitment in implementing a plan they were not part of.	The implementers own the plan and are enthusiastic to implement it.
There are limited possibilities.	Possibilities are endless.
It inhibits creativity.	Promotes creativity.
It leads to a defensive attitude that inhibits learning and team work.	There is a positive attitude that promotes openness to learning and team work.
Challenges are a tool for blaming each other.	Challenges are viewed as open doors for learning.
Problems need solutions and they are limiting.	Challenges are inviting and they need team work.

Sources: *Evolutionary sustainability (2007:2); Ludeman (2001:4); Preskill & Catsambas (2006:27); Silbert & Silbert (2007:1-2).*

The differences between problem solving in the SWOT and SOAR approaches as reflected in Table 2.2 are further discussed in Sections 2.9.1 to 2.9.2.

2.9.1 SWOT-Problem solving

Before AI organisational development was always based on the problems of the organisation. That is questions were asked about the challenges, gaps and problems. A problem solving approach to organisational change was used (Hall & Hammond, [ND]:1). Problem solving is a process and a skill that could be used for solving problems. This process involves a systematic cycle of solving the problems (UNISA, [ND]: 1).The problem solving skill was viewed as important for solving personal and organisational problems. Therefore personal and organisational life was sustained through problem solving (Business balls, 2010: 1).

Problem solving is a continuous process that involves identification of the problem as the initial step. The full extent of the problem must be defined. Exploration of the problem, setting goals for solving the problem and looking at various alternative solutions for solving the problem should be done. This means that different approaches to the solution of the identified problem are examined. An appropriate solution from the alternatives would be selected. The appropriate solution is then implemented. Then evaluate whether the problem is solved (Kerzner, 2003: 82; Parker, 2006: 311; UNISA, [ND]: 1-3). Organisations are sustained through this continuous problem solving process.

The assumption is that if what is not working well could be identified and fixed organisations could function well (Watkins & Kelly, 2010: 6). The problem focused inquiries decrease the positive thinking ability in organisational life (Ludema, 2001: 4). Problem solving promotes a slow organisational progress by bringing effective solutions for some problems.

It rarely generates new visions and it is not the best method of solving problems. Problem solving induces pain by blaming others for the past failures of the organisation. It is an unattractive way of solving problems as it promotes looking back at challenges and thus does not promote creativity. It is exhausting, blaming and it promotes defensiveness and resistance to change (Preskill & Catsambas, 2006: 27). The “judger mindset” of Adams et al has similar features to problem solving in that when it is dominating, it inhibits creativity. It leads to a defensive attitude that inhibits learning and team work (Adams et al. 2004: 113).

Problem based change has worked for years but positive based change has proved to be more effective. Looking at successes perpetuate more successes while looking at problems tend to perpetuate more problems (Preskill & Catsambas, 2006: 3-4). A problem solving approach that mixes positive and negative aspects was introduced by Albert S. Humphrey during 1960 to 1970. This mixed approach was known as the SWOT analysis where S – stands for strengths, W- for weaknesses, O- for opportunities and T- for threats as indicated in table 2.1. It solves problems by identifying strengths, weaknesses, opportunities and threats. What is good in the present situation is regarded as strengths and what is good for the future is regarded as an opportunity. The presently bad issues are regarded as weaknesses and what is bad for the future is a threat (Business balls, 2011: 6-7).

By the year 2004 the SWOT analysis was fully developed for assisting in programme evaluation and planning. It is a practical way of organising internal and external information about an organisation. It promotes setting of long and short term objectives (Business balls, 2011: 9). The strengths and weaknesses are inside while the opportunities and threats are outside the organisation (Marketing teacher, 2011: 1). SWOT analysis is one of the most trusted evaluation tools by management. It capitalises on strengths, elimination of weaknesses, grabbing the opportunities and preventing the threats (de Bono & Heller’s, 2006: 1).

2.9.2 SOAR-Problem solving

SOAR is a positive based organisational development approach in which S- stands for strengths, O- for opportunities, A- for aspirations and R- for results as indicated in table 2.1. It is a positive based approach to organisational strategic planning that is based on AI (Silbert & Silbert, 2007: 2). Appreciative Inquiry through SOAR addresses the problems and challenges of an organisation in a manner that focuses on the successes, positives, joyful and energy producing experiences of the members of the organisation (Preskill & Catsambas, 2006: 2).

Adams et al, (2004: 111) brought about an appreciative model with the features of SOAR and is known as the “learner mindset model”. This model focuses on what is right and useful in a situation. It focuses on possibilities for learning more. Assumption of the “learner model” promotes flexibility, strategic thinking and possibilities for expansion.

The aim of AI is to move people, society and organisations from focusing on problems that lock them in negativity all the time. Appreciative Inquiry focuses on successes and positives that would enrich and improve the quality of life in all aspects of life (Preskill & Catsambas, 2006: 4). With AI, instead of focusing on problems when we want to improve, we focus on improvement itself (Preskill & Catsambas, 2006: 27). Therefore AI is a radical improvement to problem solving (Willoughby & Tosey, [ND]: 9)

The SOAR approach is based on the fact that you get more of what you are looking for. So if you look for positives you would get more positives. Focusing on “what is best” would promote finding more and more of what is working well. SOAR also promotes a more participative approach to planning. This means that it involves all the stakeholders and even the implementers in the planning (Knell, 2010: 2; Silbert & Silbert, 2007: 2).

SOAR promotes positive collaboration, innovation and creativity. It promotes organisational growth that is based on potentials. That is the

future of the organisation is based on its strengths and not on its weaknesses and threats (Rapid strategy development-SOAR, 2008: 1).

The application of the SOAR planning approach is a dynamic continuous process that involves the whole organisational system. This planning system commences with an inquiry into the strengths and opportunities of the organisation. These may be from the individuals, groups, assets and stakeholders of the organisation. Based on the identified strengths and opportunities, the participants share their aspirations about the vision of the organisation. This is followed by the planning of programmes that would enhance the achievement of the desired results (Evolutionary sustainability, 2007: 2).

Ongoing innovation depends on generation of little positive ideas. When these little positive ideas are appreciated, they expand into huge results. The SOAR approach nurtures the development of these positive ideas from the entire system and not from senior members only (Evolutionary sustainability, 2007: 2).

Figure 2.4 below is an example of a deficit based and strength or success based view whilst faced by the same situation (Preskill, 2007: 3).



Figure 2.4. A glass with water indicating the deficit and strength based approaches (adopted from Preskill, 2007: 3).

The glass of water in Figure 2.4 could be viewed differently from a problem based and a strength based approach. The problem based approach could view this glass as "half empty" whilst the positive based approach could view the same glass as "half full". The positive based approach would therefore strive to fill up the glass. Although the problem based approach would also strive to fill up the glass they would be demoralised by the fact that they are faced with a "half empty" glass (Preskill, 2007:3). Therefore we need to view life situations with a positive "learner mindset" and not with the negative "judger mindset". We must choose to be "learners" and not "judgers". Figure 2.5 illustrate the importance of moving away from a "judger mindset" to a "learner mindset".

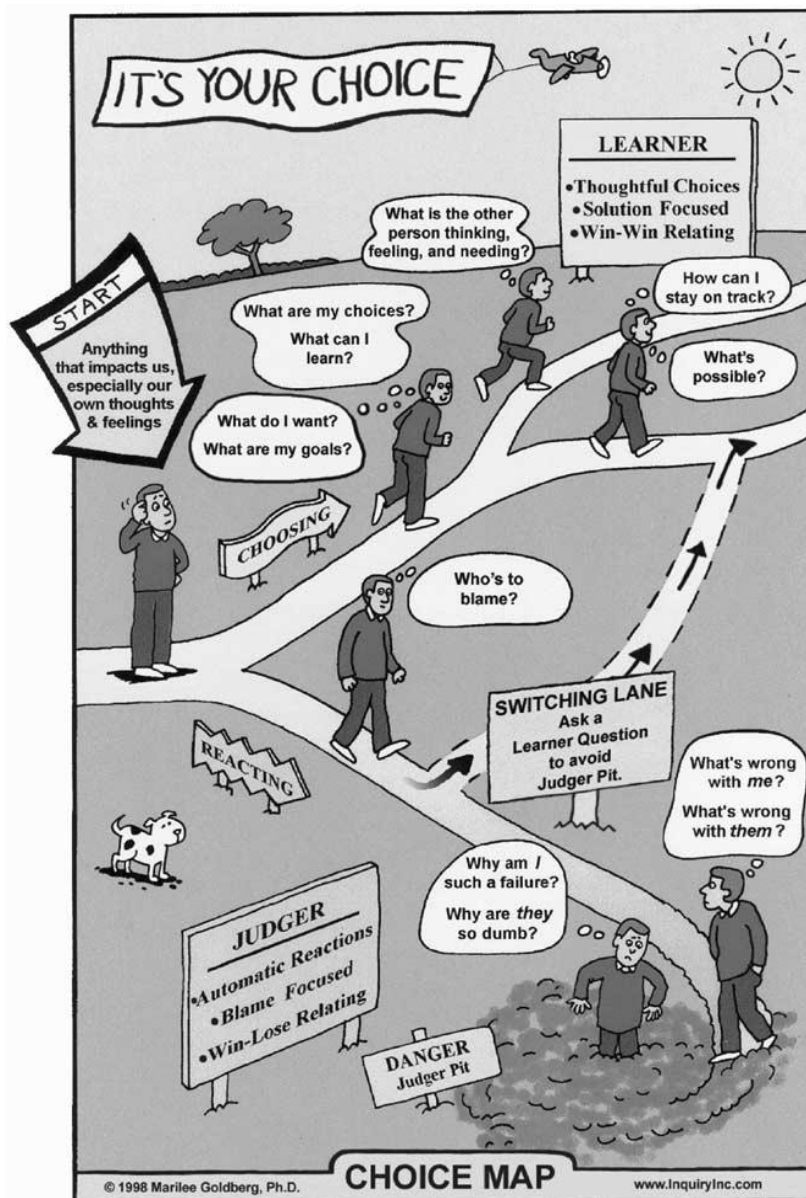


Figure 2.5 Judger and learner routes (Adopted from Adams et al. 2004: 115).

In Figure 2.5 there are two routes. Those that take the “judger” route are always blaming themselves, others and even the organisation. They are always complaining. They see themselves as failures. The “judger” route is lonely as there is no collaboration and team work. The “judgers”, be they individuals, organisations or society need to change from this “judger” route before it destroys them. They must change to the learner route through living an appreciative life and through asking positively framed appreciative questions. As seen in figure 2.5, the learner route leads to sunshine through focusing on positives, solutions and team work.

The “learners” in this route have a sense of fulfilment (Adams et al. 2004:115).

2.10 SIGNIFICANCE OF QUESTIONS

The entire society is influenced by the questions we ask. Therefore every question is capable of destroying or building life (Adams et al. 2004: 116; Cooperrider & Whitney, 2005: 19). Thoughts are answers to internal and external questions. Language and behaviour are a form of an answer to an internal question. Internal questions are powerful in generating action (Adams et al. 2004: 109-110). When deficit words are asked, we create a deficit society. The assumption of problem solving is that “an organisation is a problem to be solved (Cooperrider & Whitney, 2005: 29). The words we utilise in our daily life and even in organisational life shape our environment. These are words like burnout, dysfunctional organisation, role conflict and bureaucratic red tape. Problem based questions hinder creativity, joy and success. They promote stress and frustration (Preskill & Catsambas, 2006: 3-4). Therefore fault finding, accusing and condemning questions should not be asked (Preskill & Catsambas, 2006: 1).

When questions are based on deficit words people lose energy and engagement on the questions. In addition when questions are asked about strengths and successes, energy levels and enthusiasm rise (Preskill & Catsambas, 2006: 9). Appreciative Inquiry brought a shift in inquiring about problems. Appreciative Inquiry, unlike problem focused change, is a type of action research that develops the human energies. It focuses on asking positive questions about organisational performance. A future built on positives is likely to be positive (Reason & Bradbury, 2005: 189).

The process of asking questions is important for organisational development. Questions that promote organisational development are those that focus on strengths, successes and potentials of the organisation. These should be energising, motivating and hope building

questions (Preskill & Catsambas, 2006: 1). Questions that focus on successes and positives promote intrinsic motivation. Intrinsic motivation in turn promotes high quality learning, better task performance, reduced stress and tension. It therefore promotes productivity and team work. All these would enhance the overall organisational performance. Affirmative questions therefore create more energy, increased hope and excitement about the future (Preskill & Catsambas, 2006: 14).

In AI the challenges and problems are not dismissed and ignored. They are not used as the focus of the inquiry. Challenges, conflicts and problems are addressed by shifting from judgemental deficit questions and faults. The AI questions are based on successes and strengths so that there is a possibility and hope for a better future. The act of asking appreciative questions would lead to appreciative stories. The appreciative stories would lead to positive transformation. Positive transformational questions would lead to adherence to "positive core values" (Adams et al. 2004: 117; Preskill & Catsambas, 2006: 26).

The construction of appreciative "learner mindset" questions is a skill that should be learned both in individual and organisational life. For one to be able to ask positive transformational questions one needs to be patient, calm and reflecting. One should be aware of what needs to be accomplished from the question asked (Adams et al. 2004:118). The art of asking appreciative questions could be learned through a question storming ("Q-storming") session. These "Q-storming" sessions would promote competency in the art of asking provocative appreciative questions. The more provocative, appreciative "learner mindset" questions are asked the more our organisations could transform to excellence (Adams et al. 2004: 121). Our individual and organisational lives are shaped by the questions we ask. To create a new creative personal and organisational life we need to ask new questions (Adams et al. 2004: 108).

Questions could be asked as to whether the results of programmes are meeting the needs of people. The questions could give us an indication as to whether what we are doing does have an impact and is producing the desired results. That is whether the programme is effective, succeeding and cost effective. Questions could bring about information about the factors that are contributing to the success and effectiveness of the programme. They could bring about information about what needs to be changed and how could we change it. That is what could be done better and differently to improve the programme (Centre for creative leadership, 2011: 1; de Tufo, 2002: 1).

2.11 EVALUATION

Steinmetz in Webb, Preskill & Coghlan (2005: 2) describes evaluation as establishing the value, quality and significance of a phenomenon. Evaluation is a form of an inquiry that involves collection and analysis of data about the quality, impact and value of something like a programme, a business or a policy. That is evaluating the effects and impact of the programme (Saunders, 2006: [2-3]). The narrative stories of the stakeholders are valuable in assessing the impact of the programme (Saunders, 2006: [9]). It is the manner in which performance is appraised, be it for an individual, a team or the entire organisation (Phatak, Bhagat & Kashlak, 2005: 479).

2.11.1 Value of evaluation

For evaluation to be valuable it should be appreciative. That is the evaluation should focus on the causes of success. Appreciative Inquiry therefore could improve the manner in which evaluation is conducted. The evaluation should inquire about pockets of success within the organisation so as to build on them. Appreciative evaluation would therefore maximize the available areas of success within the individual, team and

organisation. Appreciative evaluation would make the stakeholders feel good about themselves (Donnan, 2005: 1; Koster & Lemelin, 2009: 258; Preskill, 2007: 7).

Evaluation as a planned, systematic and purposeful process would bring about valuable information about the programme. This information would assist in making decisions about areas of improvement for the programme or organisation. These could be decisions like refinement or even expansion of the programme or organisation (Webb et al. 2005: 2).

2.11.1.1 The similarities between evaluation and Appreciative Inquiry

There are a number of similarities between evaluation and AI. They both involve social constructivism by collecting data from stakeholders through culturally sensitive interviews with the purpose of improving organisations. They both involve the entire organisation in collecting data that would be used in decision making and action. Therefore evaluation like AI is aimed at individual or organisational improvement (Preskill & Catsambas, 2006: 45).

2.11.1.2 Evaluation promotes stakeholder involvement

Evaluation gives those that are directly and indirectly involved in the programme a voice. That is stakeholders coming from different backgrounds. It gives them an opportunity to have a say about their organisational processes (Saunders, 2006: [1]). It also gives the recipients of the programme a voice about the quality of the product they are receiving (Saunders, 2006: [11]).

2.11.1.3 Appreciative evaluation increases the validity of the data obtained

The validity of the data obtained is increased by the stakeholder involvement. Validity refers to the accuracy of a measure and the results obtained from that measurement. Appreciative evaluation therefore would bring accurate and useful results. The involvement of stakeholders in evaluation would enhance the use of the evaluation results by the stakeholders (Coghlan et al. 2003: 6; Zikmund, Babin, Carr & Griffin, 2010: 307).

2.11.1.4 Evaluation could bring about opportunities for growth and development

Opportunities for growth and development could be provided through evaluation. Based on the results and recommendations of the evaluation, more resources could be provided for the programme. These resources could be extra funding, human resources and equipment that is required for the programme (Saunders, 2006: [6]).

2.11.1.5 Evaluation promotes building on what is “working well”

The efficiency of the programme could be measured through evaluation. Evaluation could provide assistance for strengthening the programme. It could provide valuable information about what is useful and rewarding about the programme. It could generate valuable discussions and information about what is working well and why it is working well. Therefore it would promote building on what is working well and discovering of what is not working well. Evaluation could influence institutional learning by depicting some approaches that may bring about creative change. Evaluation could be very supportive to planning and change management. (Centre for creative leadership, 2011: 1; Saunders, 2006: [8]).

2.11.1.6 Evaluation could promote the development of learning organisation

Evaluation could promote the “culture of reflection”. There can be reflection about effective approaches to quality management during review meetings. This would promote what is known as a learning organisation. It could lead to effective learning and informed decision making (Centre for creative leadership, 2011: 1; Saunders, 2006: [9]).

Evaluation could be used as a tool for leadership development. It could assist in focusing attention on crucial issues like required leadership competencies. Therefore it could give support to ongoing learning. It promotes a learning focused mindset by nurturing an atmosphere where questions could be asked, allowing diversity of views and challenging assumptions. Evaluation is therefore an integral part of the development process (Centre for creative leadership, 2011: 1).

Research has indicated that access to advance technology does not guarantee the success of the programme. It indicated that skills like leadership, collaboration and planning which could be enhanced by evaluation are crucial for programme success. Data collected about how things were in the past as compared to now could give direction for the future (de Tufo, 2002: 1; Shutzer & Tyner, 2009: 1).

2.11.1.7 Evaluation could assist with further funding of the programme

Funders of programmes want to know if the programmes are effective. Data from evaluation could assist the funders in making decisions about funding the programme. Effective utilisation of the provided funds would further the organisational goals (Shutzer & Tyner, 2009: 1).

2.11.1.8 The deeper value of evaluation

The deeper value of evaluation is in bringing the stakeholders together, increasing collaboration and outreach, building capacity, improving service delivery and increasing sustainability. Therefore individual and organisational evaluation should be done at regular intervals so as to improve service delivery (Shutzer & Tyner, 2009: 2).

2.11.2 Advantages of evaluation

An evaluation that would bring about advantages must be positively framed as in AI. This type of evaluation would enhance the organisations capacity to collect, organise and analyse data that would promote change to the internal and external environment of the organisation (Preskill & Catsambas, 2006: 121).

Appreciative Inquiry and evaluation are not synonyms, but AI could ensure a positive based and a positive change focused evaluation (Preskill & Catsambas, 2006: 46). Appreciative Inquiry reduces the negative feelings about evaluation. Stakeholders feel more positive about an appreciative evaluation (Preskill & Catsambas, 2006: 59).

As AI is a whole systems inquiry, an evaluation aligned to it would also be holistic. Monitoring and evaluation promotes ongoing progress through the feedback given (Preskill & Catsambas, 2006: 99).

Positive ongoing evaluation promotes the participation and collaboration of the stakeholders (Preskill & Catsambas, 2006: 39). The participative evaluation process needs evaluators that have good communication skills (Preskill & Catsambas, 2006: 42). The use of appreciative evaluation provides rich data about the programme. It promotes a trusting relationship between the evaluator and those being evaluated. The use of non threatening language produces results that are acceptable to the stakeholders. It would therefore be easy to utilise the acceptable results in programme improvement (Preskill & Catsambas, 2006: 75-76).

Evaluating the performance of an organisation or even a business is very important as the results would give an indication about the business or organisational performance (Parker, 2006: 226). The evaluation, whether it is quantitative or qualitative should be guided by the questions asked. A mixed method approach (quantitative and qualitative) is more advantageous to evaluation (Preskill & Catsambas, 2006: 38). It yields a richer and comprehensive data.

There are various positive aspects that could be utilised as performance indicators during the evaluation of the performance of an organisation or a business. These could include “productivity of staff, feedback from customer satisfaction surveys, word of mouth referrals by customers and number of customers becoming regulars”. When the staff members are aware that the evaluation system is based on these positives, they would be eager to perform even better (Parker, 2006: 226).

2.11.3 Criticism of evaluation

Evaluation, if not positively framed could produce negative feelings like fear and resistance to participation. An evaluation that focuses on problems could be demoralising to the participants (Preskill & Catsambas, 2006: 59; Muller, 2008: 171).

Sometimes evaluation is used as a police in the maintenance of standards. That is where there is constant negative watching (Saunders, 2006: [8]).

In some organisations evaluation is neglected and even misused (Center for creative leadership, 2011: 1). When it is misused it could result to some incredible frustration. This frustration could be due to an evaluation that does not result to positive change (Saunders, 2006: [1]).

Evaluation is costly in terms of time, money, material and human resources required to carry it out (Preskill & Catsambas, 2006: 75-76). Programme funding allocates about ten percent of the budget to

evaluation (Saunders, 2006: 11). Therefore it is important that evaluation is carried out in a manner that would yield results that would improve the programme.

There are a number of issues that could be sources of criticism for an evaluation that is not well planned. There could be differences of perceptions about the evaluation. The objectives of the evaluation could be unclear to the participants. Other deficiencies could be environmental, personal and task related (Erwee & Venter, 2004: 260).

There should be a shift from judgemental and punitive forms of evaluation to a supportive form of evaluation. The supportive evaluation should be conducted to all the relevant stakeholders. It should also include the evaluation of the impact of the programme to the larger community (Shutzer & Tyner, 2009: 1).

2.12 CONCLUSION

In this chapter an overview of the AI process was given which outlined the basis on which this study was formed. This chapter provided the reader with information of how the AI was applied in this research.

In Chapter 3, the design and methods used in the study will be discussed comprehensively.

3 RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

Chapter 2 was dedicated to an in-depth discussion of AI. Chapter 3 is dedicated to the research methods that were utilised to address the research question, aim and objectives of this study. The research design and research methods including the population, sampling, sample size, data collection technique and data analysis are discussed. Principles to enhance trustworthiness of the study as well as specific ethical considerations are discussed in this chapter.

3.2 RESEARCH DESIGN

The research design could be described as “the overall plan for addressing the research question” (Polit & Beck, 2008:765; Basavanthappa, 2007: 164). Therefore it should be a design that is appropriate for the research question (Brink, 2006:118; Mellish, Brink & Paton, 2001: 329). This current study utilised a design that is qualitative, contextual, exploratory and descriptive in nature. This design was appropriate to the research question of this study which was “how can the Appreciative Inquiry process be utilised to conclude factors influencing the academic performance of students in the subject biological science?”

3.2.1 Qualitative design

A qualitative design was suitable for this study as it is a type of research that emphasises the qualities and meaning of social phenomenon that

cannot be examined through experiments. It was appropriate as the study was concerned with the discovery of positive experiences and meaning in relation to the academic performance of the students in the subject biological science at the specific NEI in the EC Province (Uys & Basson, 2000: 51).

The qualitative research design promoted a close relationship between the researcher and the second year nursing students following the comprehensive four year nursing diploma at the NEI in the EC Province. The researcher had to explore and describe the factors influencing the academic performance of the second year students in the subject biological science through the use of Appreciative Inquiry. The subjective nature of qualitative research was appropriate in taking into account the positive biological science experiences of the second year students. This was possible because qualitative research promotes understanding of individual and group's subjective experiences (Denzin & Lincoln, 2000: 8). The subjectivity of the qualitative design used promoted seeing the bigger picture of the factors influencing biological science performance at the NEI as seen in the wholeness principle of AI (Polit & Beck, 2008: 372).

As qualitative research is not reductive, it was used to address the broad question of this study which was "how can the Appreciative Inquiry process be used to conclude the factors influencing the academic performance in the subject biological science?" rather than specific hypothesis. Qualitative research could promote development of knowledge in areas that are poorly understood by promoting in depth understanding of a phenomenon (Fossey, Harvey, McDermont & Davidson, 2002: 718). The qualitative design promoted a greater depth for the understanding of the biological science performance. This greater depth was achieved by promoting recall of positive past and present experiences of biological science through the use of semi structured interviews. The vision, wishes, challenges and recommendations of the students with regard to biological science were also explored. The interviews yielded quality data in the form of words, phrases and full sentence descriptions. Quality was also

promoted by observing the nonverbal cues of the nursing students during the presentation and completion of the interview schedules. These observations further enriched the data obtained (Berg, 2004: 2-3). The qualitative research also promoted the exploration of the student's positive attitudes and beliefs towards biological science (Craig & Smyth, 2003: 156).

Despite the above mentioned strengths of the qualitative design used, the researcher was also cognisant of its limitations. Therefore proper preventive measures of the limitations were taken. For example due to the time consuming nature of qualitative designs a day was set aside for travelling to each one of the five campuses of the NEI where a period of about an hour was planned to be spent with the second year students (Berg, 2004: 2).

The qualitative research design was seen fitting to the indications of qualitative research as noted by Zikmund, Babin, Carr & Griffin (2010: 133 – 134). These authors indicated that qualitative research is used when a detailed, in-depth understanding of a phenomenon is required. That is the primary themes of the phenomenon under study are required. Qualitative research is suitable when the aim of the research is to understand the phenomena in its natural context or setting. That is the aspect under study is context dependent. Qualitative research is also essential when new insights are required about a phenomenon.

The characteristics of qualitative research designs as stated in Creswell (2007:37-39) were found suitable for this study. These characteristics were applied throughout the course of the study. They are discussed briefly under this qualitative design subsection as follows:

- *Natural setting*- The researcher collected data from the real life situation where the phenomenon under study was taking place. That is the data was collected from the five campuses of the NEI where there is a challenge with academic performance of biological science in the comprehensive four year nursing programme. The

study was conducted in such a way that there are no disruptions of the natural study context (Streubert & Carpenter, 2011: 20). The natural context was essential for this study for the purpose of collecting naturalistic data. That is the collected data was raw, not summarised, and not reduced. It was verbatim (Willig, 2003: 16).

- *Researcher as key instrument*- The researcher personally participated in the research process (Streubert & Carpenter, 2011: 20). The qualitative researcher personally collected data from the real life contexts of the five NEI campuses. This promoted direct interaction between the researcher and the participants. The researcher presented the research topic, its Appreciative Inquiry framework and aim and objectives. After that the semi structured appreciative interviews were administered by the researcher to all the second year nursing students studying biological science who consented to participate in the study. The full participation of the researcher contributed to the richness of the data obtained (Polit & Beck, 2012: 487).
- *Multiple sources of data*- The use of multiple data collection methods further contributed to obtaining rich narrative data. In this study the researcher used semi structured appreciative interviews, field notes, reflective diary and literature control.
- *Participant's meaning*- Qualitative researchers are committed to obtaining the viewpoints of the research participants about the phenomenon under study. The meaning given by the participants about the phenomenon under study is crucial for its understanding. During this study the researcher gave the nursing students an opportunity to give their own peak experiences, wishes and challenges about biological science. The nursing students were also given an opportunity to share their vision and recommendations regarding the subject biological science. The different positive perspectives with which the nursing students viewed the subject biological science were sort as seen in the constructionist principle of AI as discussed in chapter 2. These different participant's views further enriched the data obtained from the study.

- *Holistic account* – qualitative researchers aim at obtaining a bigger picture of the phenomenon under study. In the context of this study, through the use of AI principles like constructionist and wholeness principles, different positive stories, wishes, challenges, visions and recommendations were obtained from different nursing students from different campuses of the NEI. This gave a complex data about the factors influencing the academic performance of the subject biological science (Polit & Beck, 2012: 487).
- *Emergent design*– qualitative research designs are flexible, they could be adjusted according to contextual needs. Even with this research the researcher went to the various campuses open to contextual needs (Polit & Beck, 2012: 487).
- *Theoretical lens*- qualitative research traditions like ethnography, phenomenology and grounded theory are usually used as the basis of qualitative research design. In this research these traditional qualitative approaches were not used. Instead a form of action research theory known as Appreciative Inquiry was used. Appreciative Inquiry was used so that recommendations for biological science can be developed from the positive stories and visions shared by the second year nursing students.
- *Interpretive inquiry*– qualitative researchers aim at interpreting the rich unstructured data obtained from observations or interviews. Even in this study the researcher aimed at interpreting the emerging themes from the positive stories, wishes, challenges, visions and recommendations of the second year nursing students of the comprehensive four year nursing programme.
- *Inductive data analysis* – qualitative researchers through data collection and analysis move from a specific identified problem to a much broader understanding of the problem. They can even develop a broad theory about the specific problem. In the study conducted by the researcher the aim was also to get a broad understanding about the factors influencing the academic performance in biological science of students in a NEI in the EC Province.

3.2.2 Contextual design

In qualitative research designs the context in which the phenomenon is taking place is viewed as crucial for its understanding. That is qualitative research is “context dependent” (Speziale & Carpenter, 2007: 20). Therefore in qualitative research data is collected “in real world, naturalistic settings”. In order to enhance a broad understanding of the phenomenon under study, qualitative research data is purposely collected in a variety of natural contexts (Polit & Beck, 2008: 221). The meaning that is given to any experience could be understood when it is related to its context, be it a personal or a social context. This contextual based understanding of a phenomenon is known as a contextual design (Terre Blanche & Durrheim, 2002: 125).

Contextual studies are conducted for the purpose of avoiding the separation of the phenomenon under study from its context (De Vos, 2001: 281). That is the context where the event is happening is of significance and of interest (Mouton, 2002: 133). In a qualitative contextual design participants should be observed or interviewed in their real life situations. That is data is collected exactly where the issue under study is happening (Creswell, 2007: 37). Researchers conducting contextual studies should be alert and should plan for contextual disruptions. These could be in the form of ringing telephones and in and out movement whilst for example interviews are in progress (Polit & Beck 2008: 400-401).

In the context of this study the second year nursing student’s positive biological science experiences were studied in relation to the setting or context of the NEI in the EC Province. This was done to promote a contextual holistic understanding that would promote a holistic understanding of the factors influencing the academic performance in biological science at the NEI. The contextual design was also conducted to avoid removing the nursing students from their campuses where the biological science experiences are taking place. The context was viewed as

important because any aspect that is studied is dependent on its context (Creswell, Hanson, Plano Clark & Morales, 2007: 245; Streubert & Carpenter, 2011: 21; Zikmund et al. 2010: 133-134).

The natural context where the nursing students are was important because qualitative research is driven by the participants. That is it is a "bottom up approach". The contextual design was well fitting to AI which is the conceptual framework of this study. Appreciative Inquiry involved requesting the second year nursing students to reflect on their most satisfying experiences, wishes, challenges, vision and recommendations for the subject biological science. In this contextual study the data and its meaning was generated from the participants. This allowed the emergence of new unanticipated meanings and experiences. Data was collected from the five campuses of the NEI with the hope of obtaining different contextual perspectives about the factors influencing the academic performance of biological science. The logic of replication was also used through the use of the same procedures in each campus (Creswell et al. 2007: 246; Reed, 2007: 2; Willig, 2003: 15).

Contextual disruptions were avoided by first of all requesting permission from each campus management to conduct the study. An appropriate time for conducting the study was agreed upon. The appreciative interview schedules were completed in classrooms where there are no telephones.

3.2.3 Exploratory design

Because the researcher did not want to lose contact with the data, the qualitative research methodologies like ethnography, phenomenology, grounded theory and historical research were not used. The researcher engaged in an exploratory design in order to obtain a broad understanding of the factors influencing the academic performance of biological science at the specific NEI in the EC Province (Bless & Higson – Smith, 2004: 41). This exploratory engagement was done in order to establish any

interesting patterns in the collected data (Mouton, 2002: 103). Exploratory research was found valuable in identifying important variables around the subject biological science (Welman & Kruger, 2001: 187).

3.2.4 Descriptive design

The exploration of the factors influencing the academic performance of biological science yielded straight qualitative descriptions. That is they resulted to a descriptive design which was a complete and accurate description of the factors influencing the academic performance of biological science by the second year nursing students as they experience them (Struwig & Stead, 2004: 8). These were described as they are experienced through all the sense organs, which included "hearing, seeing, believing, feeling, remembering, deciding, evaluating, acting and so forth" (Polit & Beck, 2008: 228). The descriptive study was powerful in describing the nature and intensity of past and present positive biological science experiences at the NEI (Polit & Beck, 2008: 278; Rubin, Rubin, Haridakis & Piele, 2010: 198).

The thick descriptions obtained from the descriptive design were crucial in ensuring transferability of the data. They also ensured availability of comprehensive summaries (Polit & Beck, 2008: 539). Descriptive exploratory designs are used more often and they will continue to be used in the future (Schneider, Whitehead, Elliot, Lobiondo-Wood & Haber, 2007: 117). The researcher had to ensure that the descriptions are as objective as possible. That is there was no distortion of the participant's experiences. The objective descriptions also gave detailed information about the context of the study (Polit & Beck, 2008: 406).

All these design features lead to a qualitative, contextual, exploratory and descriptive design that focused on the factors influencing the academic performance in biological science at the NEI in the EC Province.

3.3 RESEARCH METHODS

The research method is defined as a general plan for the study and should always be appropriate for the research question according to (Creswell et al. 2007: 238). Thus the research methods should be specific to the research study and should provide relevant techniques for the study (Kothari, 2006: 7-8; Rajasekar, Philominathon & Chinnathambi, 2011: 2-3). The methods utilised in this study will be discussed in terms of the population, sampling, sample, data collection and data analysis. An overview of the methods used in this study is summarised in Table 3.1.

Table 3.1 Summary of the methods of this study.

Population	Sampling	Sample	Data collection	Data analysis	Trustworthiness
2 nd year nursing students currently studying biological science at the NEI in the EC province (Section 3.3.1)	Non probability – Consecutive. (Section 3.3.2)	429 nursing students. (Section 3.3.2)	Self-reported AI interview schedules. Field notes. Reflective journal. Literature control. (Sections 3.3.3.2 – 3.3.3.6).	Content analysis. (Section 3.3.4)	<p>Principles used during data collection.</p> <p>Prolonged engagement.</p> <p>Data and method triangulation. (Section 3.3.3.8).</p> <p>Principles used during data analysis.</p> <p>Coder triangulation.</p> <p>Peer review and debriefing.</p> <p>Inquiry audits. (Section 3.3.4.4)</p>

As seen in Table 3.1 the methodological techniques of this study included the population identification, sampling and the sample, data collection and

analysis and maintenance of rigour. These techniques are discussed in detail in Sections 3.3.1, 3.3.2, 3.3.3 and 3.3.4.

3.3.1 Population

A population for a study would be the whole group of people, objects or events that meet the criteria that is studied by the researcher and to which the study results could be generalised (Brink, 2003: 132). This could be called the target population. The target population could be all the elements who met the criteria for sampling. In the context of this study the target population would be all the nursing students following the comprehensive four year nursing programme and currently studying the subject biological science in South Africa (Burns & Grove, 2009: 714).

The people, objects, or events that are within reach of the researcher would be an accessible population from the target population (Burns & Grove, 2009: 344). The accessible population in this study was all the second year nursing students of the comprehensive four year nursing programme studying biological science in the specific NEI in the EC Province. These second year nursing students met the inclusion criteria for the study since they had studied biological science in the first year and were now studying it at second year level. Some of these students had successful biological science outcomes whilst others have experienced unsatisfactory outcomes either at first year or second year. Thus the accessible population for this study shared the common characteristic of currently studying biological science at second year and this was the inclusion or eligibility criteria for this study (Polit & Beck, 2008: 338; Zikmund et al. 2010: 387).

There are certain factors that could affect the inclusion criteria in a study. These are factors like costs, practical constraints, ability to participate in the study and design considerations. Due to cost and time factors the researcher only included nursing students from a specific NEI in the EC

Province. The researcher had to consider the availability of the students. That is data collection was done when the students were not writing examinations (Polit & Beck, 2008: 338).

3.3.2 Sampling and the sample

Sampling would be a process of selecting a portion of the population to be utilised in the research study. Sampling rather than studying the entire population would be cost effective in terms of money and time taken to collect and analyse the data. Collecting the data from the whole population could be very time consuming as compared to collecting the data from a portion of the population. The portion of the population that was selected for conducting the study was the sample for the study. The actual selection of the sample was known as sampling (Burns & Grove, 2009: 721; Welman & Kruger, 2001: 46; Zikmund et al. 2010: 387).

Two broad types of sampling approaches could be used by researchers. These are known as probability and non- probability sampling. Each one of these sampling approaches would have some sub- categories which are used in specific types of research. Probability sampling could be more representative of the population. In probability sampling all the population elements could have an equal opportunity of being included in the study. Sampling error and bias could be reduced when probability sampling is used. Probability sampling could also promote the use of inferential statistics. These probability sampling approaches could be suitable for quantitative studies as they could promote generalisation of the study findings to the entire population of the study. To conduct a probability sampling approach the researcher would need to have the entire list of the members of the population. The sample would warrant that it be randomly selected from the entire population list (Brink et al. 2010:126).

Random selection is what differentiated probability sampling from non- probability sampling. In probability sampling randomisation should be

used whilst in non-probability sampling it could not be used. Most researchers would prefer to use probability sampling but its use is not always possible in social research. Therefore non-probability sampling would be ideal for social research as suggested by (Trochim, 2006: [1]).

In the conducted qualitative study, a thorough understanding of the factors influencing the academic performance in the subject biological science was more important than generalisation. Also what was important was the identification of rich sources of data. Therefore the non-probability sampling approach was used. The focus was to purposefully have study participants that have had the experience under study. This was the experience of studying biological science at the specific NEI in the EC Province (Burns & Grove, 2009: 355; Gerrish & Lacey, 2006: 181).

In non-probability sampling the probability of any element of the population being selected would not be specified. That is the accurate representation of the entire population could not be possible. Therefore generalisation could be impossible. The study results could be biased as it could be difficult to determine sampling error (Brink et al. 2010: 131-132; Welman & Kruger, 2001: 61).

Despite the above mentioned shortcomings, non-probability samples could be used widely due to some of their advantages. Non-probability sampling could be easy to use especially if the population is not suitable for probability sampling like when there is no population list. It could also be economical with regards to time and money. That is where the systematic techniques of probability sampling would not be used. Data obtained from non-probability sampling could be of high quality if rich sources of data who are willing and able to share their experiences were obtained (Brink et al. 2010: 131-132; Welman & Kruger, 2001: 62). The non-probability methods that could be used by researchers are convenience sampling, quota sampling, purposive sampling and consecutive sampling (Polit & Beck, 2008: 341; Polit & Beck, 2010: 311). In consecutive sampling all the participants from an accessible population

who meet the inclusion criteria are recruited. This involvement of all the participants from the accessible population would reduce the risk of bias (Polit & Beck, 2010: 311).

In this study a consecutive sample of second year nursing students following the comprehensive four year nursing programme from the specific NEI in the EC province was used. These students were selected on the basis of them having completed biological science at first year level and currently studying biological science at second year level. This was the eligibility or inclusion criteria for this study. The qualitative, contextual, exploratory and descriptive appreciative study of the factors influencing the academic performance in the subject biological science was presented to all the available second year nursing students studying biological science from each of the five campuses of the NEI in the EC province. Some second year nursing students were not available in some campuses as they were in the clinical areas. A short presentation of Appreciative Inquiry, participant leaflet and informed consent for the study was presented to all the second year nursing students that were available in class at the moment. This was a presentation of the title, purpose and objectives of the study as follows:

- *Title of the study* – Factors influencing the academic performance in biological science of students in a Nursing Education Institution in the Eastern Cape Province.
- *Overall aim* – Use of Appreciative Inquiry to collaboratively explore the factors influencing the academic performance of second year students registered for the subject biological science in a NEI in the EC province.
- *Specific objectives* – Explore and describe the factors contributing to the academic performance of students in the subject biological science. Make recommendations to the NEI and the ECDoH based on the findings of the study.

The presentation also covered the ethical issues pertaining to the study. These were issues like explanation of the procedure to be followed, risk

and discomfort and benefits of the study. The benefits were aligned to AI as the conceptual framework of the study. The 5-D cycle of AI was used as the basis of explaining the benefits of the study. That is AI was first defined to the second year students. The importance of discovering “what is working well” instead of what is wrong within the subject biological science was emphasised. This was about telling stories about what is positive about biological science. Even challenges of biological science would be reframed in a positive manner so that the focus is on positives because what is required is positive biological science performance. Based on the positive stories the students would be encouraged to “Dream”, “Design” and decide on the “Destiny” of biological science. This would be in the form of a vision and suggested recommendations for biological science (Cooperrider & Whitney, 2005: 7-10). After the AI process explanation, the students were alerted about the voluntary nature of participating in the study. They were also informed about their right to withdraw from the study.

Then those who signed the consent form comprised the consecutive sample of the study. The sample included students who had successful performance and those who had unsuccessful performance in biological science. That is there was a certain group of second year students that the researcher was targeting for the study. This group met the criteria for inclusion in the sample (Trochim, 2006: [2]).

Table 3.2 provides an indication of the number of second year nursing students in each campus, the number of students who consented to participate in the study and the number of students who actually completed the appreciative interview schedule.

Table 3.2. Number of second year students in each campus, number of students who consented and those who actually completed the interview schedule.

Campus	Number of second year students	Number who consented	Number who completed the interview schedule
A	194	91	80
B	139	89	87
C	180	149	139
D	188	43	42
E	81	81	81
TOTAL	782	453	429

As reflected in table 3.2 the NEI had a total of seven hundred and eighty two (782) second year nursing students studying biological science in 2011 when the data was collected. The researcher had a sample of four hundred and fifty three (453) students who signed the consent forms. As only four hundred and twenty nine (429) students completed the interview schedule, twenty four (24) students withdrew from participation.

3.3.3 Data collection

Researchers could choose from three types of data collection methods for collecting data for their studies. These methods could be bio-physiologic measures, observations and self-reports. Bio-physiological measures could be used in quantitative studies and could involve the use of specialised instruments for measuring physiological and physical variables. Observations could be used in qualitative studies for observing the various activities of the study participants. Self-report methods could be used both in quantitative and qualitative studies. In quantitative studies the respondents would be expected to respond to close ended questions presented by means of a questionnaire.

3.3.3.1 Key dimensions of qualitative data collection methods

All data collection methods including qualitative ones have four dimensions and they are:

⇒ **Structure**

Qualitative data collection methods would be unstructured or semi structured. Participants would therefore respond to interviews freely in their own words. If observations are used participants would continue with their day to day activities while the researcher is observing (Polit & Beck, 2010: 340).

In qualitative studies the participants would be expected to respond to unstructured or semi structured questions asked from them. These unstructured and semi structured self –reports could be in the form of interviews (Polit & Beck, 2008: 369-371; Mellish et al. 2001: 330). Unstructured interviews would be like having a face to face interactive conversation. They could be ideal when the researcher does not have a clear idea about the phenomenon under study. Semi structured interviews would be used by researchers when they are aware of their questions but the answers could not be predicted. Therefore the participants would be asked predetermined questions to which they must respond freely in their own words (Polit & Beck, 2008: 392-394).

⇒ **Quantifiability**

Quantification of qualitative data would be a lengthy process that is not so easy. Researchers had to take time analysing the qualitative data until they come up with codes that can be processed quantitatively (Polit & Beck, 2010: 340).

⇒ **Objectivity**

Qualitative data collection methods are not objective as quantitative data collection methods (Polit & Beck, 2010: 340). Qualitative data collection methods are subjective in that they take into consideration the

participant's and researcher's experiences within the naturalistic context. That is the research results are a result of a contextual value laden interaction process between the researcher and the participants (Polit & Beck, 2010: 15).

⇒ **Obtrusiveness**

Ethically study participants should be aware of their participation in research. Even in this study the participants consented to participate in this research (Polit & Beck, 2010: 340).

3.3.3.2 Data collection methods used in this study

During this study the researcher utilised self-reported narrative appreciative interview schedules, field notes, a reflective diary and literature control.

⇒ **The self-report narrative appreciative interview schedule**

This was a written list of the questions the students should respond to (Brink et al. 2010: 151). These schedules were in the form of semi structured interviews. That is the researcher had a written question guide to which the participants had to respond freely in their own words. That is the interviews had open ended questions with no predetermined answers (Polit & Beck, 2008: 394; Brink, Van Der Walt & Van Rensburg, 2008: 152; Watson, McKenna, Cowman & Keady, 2008: 282; Sullivan & Decker, 2005: 248 - 249). The time consuming nature of interviews was overcome by having the students respond to the interview schedule in writing at the same time (Polit & Beck, 2008: 401). The AI process was used to explore and describe the factors influencing academic performance of students in the subject biological science. The researcher utilised a self-reported narrative interview schedule to obtain participants' views on their peak experiences, wishes and challenge, vision and recommendations pertaining to the subject biological science. These interview schedules

were modified from those that were previously used by the researcher's supervisor.

⇒ **Field notes**

Immediately after the interview session field notes were written by the researcher. In order to have accurate comprehensive descriptions the researcher wrote field notes on a daily basis after the data collection process from each campus. These field notes were thick descriptions of what transpired at each campus. Great enthusiasm towards the study was noted from both the nurse educators and the students. This enthusiasm was more evident in campus E where they stated the urgency of having researched information about biological science. It was also seen through 100% participation of campus E students as seen in table 3.2 (Polit & Beck, 2008: 401; Silverman, 2005: 174; Gibbs, 2009: 26).

⇒ **The reflective diary**

A reflective diary of the thoughts and feelings of the researcher about what went on in each campus was kept. Reluctance about writing positive biological science stories was reflected by the students. In order to get over the reluctance the students were reminded about the physical and mental enrichment of AI (Polit & Beck, 2008: 406).

⇒ **Literature control**

The data obtained from the various campuses of the NEI was compared with the literature reviewed for this study as a form of a literature control. The literature control was mainly used during the data analysis period.

The various forms of data that were kept (interview schedules, field notes, reflective diary) were a means of ensuring the trustworthiness of the data (Polit & Beck, 2008: 543). The data collection and even analysis was started at campus E which had the smallest number of second years as seen in table 3.2. Then further data collection was planned to follow the same pattern of moving from the smaller to the bigger campus in terms of number of second year students. This movement from the simple to the

complex was also a means of ensuring the trustworthiness of the collected data. That is the researcher would be more proficient in collecting the data by the time she was at the biggest campus (Lombard, Snyder-Duch & Bracken, 2002: 601).

Table 3.3 below is an indication of the data collection dates and kilometres to the five campuses of the NEI.

Table 3.3. Data collection dates and kilometres to the five campuses of the NEI

Campus	Data collection dates	Number of kilometres to the campus
E	25 August 2011	370 kilometres
B	30 August 2011	235 kilometres
C	01 September 2011	230 kilometres
A	02 September 2011	48 kilometres
D	06 September 2011	150 kilometres

As seen in table 3.3 data collection was commenced as planned from the smallest campus E on 25 August 2011. Campus E is also the furthest as it three hundred and seventy (370) kilometres from the NEI central office. From there the researcher had to collect data according to the availability of the students and not from smallest to the biggest campus as planned. The data collection was also not completed in August as planned but continued up to 06 September 2011. The kilometres travelled by the researcher to the various campuses are also indicated in table 3.3. The return kilometres from the campuses are double the ones indicated in the table.

The data collection methods were used to translate the biological science experiences into data that could be analysed. The interview schedules written by the students were based on the 4-D cycle of Appreciative Inquiry as indicated in Sections 3.3.3.3 to 3.3.3.6.

3.3.3.3 Discovering the best of “what is”

Using the Appreciative Inquiry as the framework of this study, the second year nursing students were requested to reflect back in writing about their peak experiences of biological science during their first and second years of study. This was a reflection about past and present biological science experiences. As interviews are a qualitative data collection method that would yield comprehensive data about past, present and the future they were found suitable for this reflection (Polit & Beck, 2008: 369). The students had to reflect holistically about the strengths, passions, innovations and values around the subject biological science. They had to write about their successes in biological science and the causes of those successes. A strength based reflection was also encouraged about the challenges experienced in biological science. This reflection was a form of an appreciative evaluation of biological science. It was done to promote discovery of personal and organisational strengths (Cooperrider & Whitney, 2007: 7; Mason, 2005: 63).

3.3.3.4 Dreaming “what could be”

According to the interview schedule the second year students were also expected to state their wishes for the subject biological science. These students were encouraged to have big creative dreams about biological science based on their discovered positives and strengths of biological science. The researcher hoped to get multiple positive dreams from the different written interview schedules of the students. These wishes were about a better future of biological science. That is improved performance of biological science. During this phase the students were reflecting their wishes about the improvement of biological science performance (Reed, 2007: 33).

3.3.3.5 Designing “what ought to be”

Based on the multiple dreams that emerged during the dreaming phase the students were required to design a future vision for the subject biological science. The students were asked to come up with a design of a better biological science that has improved academic performance. They were expected to write their vision about biological science. This vision could be crafted from the identified strengths and successes of biological science (Cooperrider & Whitney, 2005: 9-10).

3.3.3.6 Delivering “what will be”

During this phase the students were requested to write their recommendations or suggestions towards the improvement of the performance of biological science. These were future action plans of biological science. That is the destiny of biological science was about continuous learning and improvement. These recommendations had to be linked to the identified positives and strengths, on the identified wishes and on the suggested vision of biological science (Cooperrider & Whitney, 2005: 11).

3.3.3.7 Value of reflection as used in this study’s data collection process

Reflection could be viewed as the act of deliberately thinking about an action with the purpose of improving that action. Reflection could enhance study performance. This reflection could occur at three levels which are technical, practical and critical. Technical reflection would be about the application of knowledge. In the context of this study it would be about application of biological science knowledge. Practical reflection involved linking actions to value systems. This could involve linking actions around biological science to personal and professional value systems. Critical reflection would involve reflection about the entire teaching and learning including its environment (Lai & Calandra, 2007: 68).

The three types of reflection as indicated by Lai & Calandra (2007: 68) were covered by the appreciative interview schedule of this study. These were reflection on action or experience. Reflection in action involved thinking about current experiences. Reflection for action involved thinking about the future.

Appreciative reflection as used in the interview schedule of this study is viewed as a learning tool in higher education. It could promote connection with past experiences and could therefore promote deep learning. It could promote reframing of problems and viewing of a situation from different angles. That is it could promote a holistic perspective as seen in the characteristics of qualitative research. Appreciative reflection could promote life-long learning. It could also make students aware of their assumptions and how these can impact on their educational outcomes. Therefore it could promote arrival at an appropriate plan of action (Plack & Greenberg, 2005: 1546).

The appreciative reflection would promote students awareness about their inner positive thoughts. Through the data obtained from this study the nurse educators of the NEI would be aware of the student's positive thoughts. This reflection would promote positive interaction of the students with the biological science learning content and related clinical experiences thereby improving performance. Reflection would promote personal and professional growth through the promotion of the positive inner dialogue (Hubbs & Brand, 2005: 65). The written appreciative reflection would remove doubts and promote clarity about positive biological science aspects. These positive aspects could be maximized to enhance the performance of biological science (Hubbs & Brand, 2005: 70).

3.3.3.8 Trustworthiness during data collection

Trustworthiness would be about ensuring that data of high quality is obtained. In this study quality enhancement was ensured by prolonged engagement and data and method triangulation.

⇒ **Prolonged engagement**

Prolonged engagement was maintained by the researcher by engaging with the second year nursing students in all the five campuses of the NEI. The same self-report narrative appreciative interview schedule was used in all the campuses. This allowed the researcher to obtain comprehensive information about the factors contributing to the academic performance in biological science. That is the prolonged engagement promoted data saturation (Polit & Beck, 2010: 495).

⇒ **Data and method triangulation**

Triangulation meant the use of a variety of data sources. Under triangulation time and space triangulation was done to ensure quality data. In space triangulation data was collected from the five different campuses of the NEI for purposes of checking the consistency of the emerging themes around the factors influencing the academic performance in biological science. Time triangulation involved collecting data from the five campuses at different times to ensure that consistent responses are obtained at those different times. Method triangulation was also done to ensure that rich comprehensive data is obtained. That is the self-report narrative appreciative interview schedule, field notes and reflective diary were used. The field notes contained rich data about what transpired in the field (Polit & Beck, 2010: 497-498).

The prolonged engagement and the various types of triangulation used during data collection ensured credibility and dependability of the data. Credibility ensured that the data obtained is true. Dependability was about whether the data obtained is reliable (Polit & Beck, 2010: 492).

3.3.4 Data analysis

The process of bringing order, structure and meaning to the mass of collected data obtained during the self-reported narrative appreciative interview schedules, field notes and reflective diary was done through

data analysis. Data analysis was one of the important steps of this research process because the meaning of the narrative data could only be achieved through it (De Vos et al. 2005: 339; Leech & Onwuegbuzie, 2007: 562). As the data obtained was in narrative form, content analysis was used as a data analysis method. Content analysis was used as a form of textual analysis (Schwandt, 2001: 34). It was also used as a coding system where narrative data was transformed into standardised form (Babbie, 2004: 318).

Narrative data could be from interviews and unstructured observations. In qualitative research the narrative data could be divided into small units (Creswell & Plano Clark, 2007: 131). These units could be physical, syntactical, categorical, propositional and thematic (Polit & Beck, 2008: 518). The physical units would include a consideration of aspects like the size as indicated by the number of pages and space in the print media. It could also include the amount of time taken for compiling the information. The syntactical units could take into consideration aspects like the words, sentences, phrases, clauses and paragraphs. Propositional units would consider questions, statements and arguments. Thematic units could consider the main ideas from the narrative that are related to certain aspects (Du Plooy, 2001: 191). The categorical units would consider common aspects that form a certain category. Furthermore narrative information could also be clustered according to similarities (Polit & Beck, 2008: 518).

3.3.4.1 Advantages and disadvantages of content analysis

In the context of this study content analysis was used because of its benefits which are as follows:

- It is a flexible method in the analysis of text data. That is it could be used with any form of text data (Hsieh & Shannon, 2005: 1277).
- It could enhance understanding of the descriptive and exploratory data obtained from the reflective stories of the second year nursing

students. Thus content analysis as an objective method was useful in analysing the descriptive data obtained.

- It therefore promoted a broad description of the factors influencing the academic performance in biological science in the NEI in the EC Province.
- It provided a means of grouping the sentences and phrases containing the appreciative stories, wishes, challenges, vision and recommendations for biological science into meaningful categories.
- Because a contextual design was used in this study, content analysis promoted connection of the data with its context in order to guide the desired actions. Content analysis was therefore regarded as a context sensitive data analysis method.
- Content analysis could be used deductively and inductively. Its deductive use could be when a study is based on a theory or literature review. In this current study an inductive content analysis was done. That is movement from the specific aspect of biological science performance to broad statements about the factors that could influence this performance (Elo & Kyngas, 2007: 108-109).

Despite the above mentioned benefits researchers should be cautious of the possible shortcomings of content analysis. Content analysis could be more complex as compared to quantitative analysis. This complexity could be due to the fact that content analysis is not based on predetermined formulae and standardisation. There are no specific guidelines for the analysis. It could thus depend on the skill and competency of the researcher in analysing qualitative data. Content analysis would also be a time consuming process due to the required repeated reading of the raw data. The commencement of the content analysis process could be the most challenging with the quantity of qualitative data being the most frustrating. Keeping the research question in mind would be essential to avoid coming up with unrelated categories (Elo & Kyngas, 2007: 113). Researchers should guard against coming up with inappropriate findings due to failure to identify key contextual categories (Hsieh & Shannon, 2005: 1280).

3.3.4.2 The steps of the content analysis process

Data analysis was done both on manifest content and latent content. The manifest content was the written data on the self-reported narrative appreciative interview schedules. The latent content involved an interpretation of the underlying meaning of the data (Graneheim & Lundman, 2003: 105). The emerging narrative information was analysed using the six steps to be used during content analysis provided by Creswell, (2003:191).

Step 1: Data was organised and prepared for analysis. Data in this context was in the form of the self-reported narrative interview schedules. These interview schedules were placed in separate labelled envelopes according to the five different campuses. The reading and coding was started from the first campus of data collection up to the last one of the 06 September 2011.

Step 2: Involved reading through the data to obtain the general sense of the information and to reflect on its overall meaning. Meaning was attached to each section of the interview schedule. These sections included the positive stories, wishes, challenges, vision and recommendations about biological science. These included the ideas and impressions from the participants, their tone, overall depth, credibility and use of information. In order to ensure trustworthiness of the data analysis results the researcher had a co-coder for purposes of ensuring consistent analysis (Lombard et al. 2002: 590).

Step 3: Detailed analysis started with a coding process. According to Creswell, (2003: 192) "*Coding is the process of organizing the material into "chunks" before bringing meaning to those "chunks"* The text data was categorized and labelled with a term. The eight steps of the coding process as delineated by Creswell in Tesch (1990: 142-145), were used as follows:

- First of all, the researcher read through all the transcriptions carefully in order to get a sense of the whole. Repeated reading of the self-reported interview schedules was done so as to have a

holistic overview of the data. Words that were capturing key concepts from the various sections of self-reported interview schedule were highlighted by underlying them with a red pen (Hsieh & Shannon, 2005:1279).

- The researcher then picked up the shortest, interesting document and read through it to get the underlying meaning. The same was repeated with all the documents and thoughts were written down in margins.
- The researcher then wrote a list of all topics from the documents in a notebook. Similar topics were then clustered together to represent major topics, unique topics and left overs. The topics were organised according to the different sections of the self-reported interview schedule. That is according to the peak experiences, wishes, challenges, vision and recommendations. These lists were compiled for each campus.
- The most descriptive wording for the topics were found and turned into themes. The broad themes that emerged were further broken down into categories and sub-categories where necessary (Morse & Field, 2002: 115; Huberman & Miles, 2002: 313). Examples for each category were obtained from the text data in preparation for reporting. As a form of literature control the emerging categories were compared with existing literature related to biological science (Hsieh & Shannon, 2005: 1279). The emerging categories were also organised according to the subsections of the self-reported interview schedule.
- Reduction of the total list of categories was done by grouping topics that relate to each other according to the sub-sections of the self-reported interview schedule.
- A final decision on the abbreviation for each category was made.
- The data material belonging to each category was assembled in one place and preliminary analysis performed.
- The existing data was recorded.

Step 4: The coding process was used to generate a description of the setting or people as well as themes and categories. This involved a detailed rendering of information about people and events in each campus. Thereafter the coding was used to generate a small number of themes and categories. These themes were used as major findings of the study and were stated under separate headings in the findings sections of the study. The themes were then shaped into general description as in phenomenology. These themes covered the peak positives, wishes, challenges, vision and biological science recommendations.

Step 5: A detailed discussion of the themes was presented. Visuals like tables were used to substantiate the discussion. The themes, categories and sub-categories from the tables were related to the context by means of direct quotes from the written narrative interview schedules.

Step 6: The meaning of the data was then interpreted. The interpretation was viewed in terms of each campus and also in terms of the entire NEI. It involved feedback on the outcome of the study and the lessons learned. It also involved a comparison of the findings with information gleaned from the literature. It also suggested new questions that could be asked.

3.3.4.3 Promotion of trustworthiness during the content analysis

Some of the predetermined criteria for judging quality in qualitative research were used to ensure trustworthiness during the data analysis process (Rolfe, 2006: 304). A thorough description of the content analysis process followed during data analysis was given to ensure trustworthiness. Dependability was promoted through the repeated reading of the raw data to ensure that there is consistency in the emerging categories (Elo & Kyngas, 2007: 112-113). For purposes of ensuring confirmability some categories were supported by direct quotations from the self-reported narrative interview schedules completed by the research participants. These quotations demonstrated sensitivity of

the data analysis process to the context of the study (Polit & Beck, 2010: 492; Smith, 2003: 232-233).

Credibility was maintained by ensuring that the emerging themes are aligned to the objectives of the study. The emerging themes were also aligned to the sub- sections of the self-report narrative interview schedule. These sub- sections were peak stories, wishes, challenges, vision and recommendations for the subject biological science. The researcher also ensured that the emerging categories were mutually exhaustive and exclusive. That is there were enough categories to cover the data. This prevented loss of data. The exclusivity ensured that there was no overlapping of categories which could result to inflated results. That is it was ensured that the emerging categories cover the raw data holistically with no under or over representation (Graneheim & Lundman, 2003: 109-110). To ensure reliable coding a co-coder was appointed for the data analysis process. The themes, categories and sub-categories obtained by the researcher and the co-coder were used for further calculation of agreements between the two coders. This was done at a meeting held by the researcher and the co coder. Where there was a disagreement further rechecking was done (Lombard et al. 2002: 590).

3.3.4.4 Strategies used for validating coding

Coding is the link between the raw data and the theoretical concepts of the researcher (Buber, Gardner & Richards, 2004: 125).

⇒ Coder triangulation

Triangulation assisted in obtaining true information. Coder triangulation involved the use of two coders to ensure the production of credible results. The researcher as the first coder received a coding certificate from the second coder (co coder) as proof of the validity of the coding (Polit & Beck, 2010: 500).

⇒ **Searching for disconfirming evidence and competing explanations**

During the data analysis the coders made an effort to validate the emerging categories by thoroughly searching for any categories that could disconfirm the already existing categories. This was done to promote confidence in the truthfulness of the emerging categories. As the data was collected from five different campuses the analysis was also commenced from the smallest campus up to the largest campus in terms of student numbers. Confirmation and disconfirmation was sort as the analysis was progressing from campus to campus. This promoted refinement of the categories as the analysis continued. Competing themes and categories were also noted (Polit & Beck, 2010: 501).

⇒ **Peer review and debriefing**

Peer review and debriefing was achieved by presenting and discussing the themes, categories and sub-categories with the researcher's supervisor and co- supervisor. These supervisors were experienced qualitative and quantitative researchers. These themes, categories and sub-categories were presented to the supervisors in writing. Discussions were held regarding the quality and completeness of the data in terms of emerging themes, categories and sub-categories (Polit & Beck, 2010: 502).

⇒ **Inquiry audits**

The researcher also presented the data collection records to the co- coder for purposes of ensuring dependability and confirmability. This was a way of ensuring reliability and objectivity of the emerging themes, categories and sub-categories (Polit & Beck, 2010: 502).

3.4 ETHICAL CONSIDERATIONS

3.4.1 Definition of ethics in research

Ethics is about moral values that should be observed when conducting research. It would also entail protection of human subjects during the study (Joubert & Ehrlich, 2009: 30-31). Honesty and integrity must be maintained throughout the research project (Burns & Grove, 2009: 184). The researcher adhered to all the aspect relating to ethical considerations of a research study, as discussed in this chapter.

3.4.2 Procedures for conducting an ethical study

A number of procedures were observed by the researcher in order to conduct an ethically sound study. These procedures are discussed in Sections 3.4.2.1 to 3.4.2.6.

3.4.2.1 External review

The researcher submitted the research proposal to the ethics committee of the university. The committee ensured that quality research of a high standard would be conducted (Bell, 2010: 47). It also ensured that human rights would be protected during the research process (Polit & Beck, 2008: 184). Permission to conduct the study was granted by the ethics committee of the University of Pretoria.

3.4.2.2 Request permission to conduct the study

Permission to conduct the study was requested in writing from the EC DoH and the principal of the NEI. Both the NEI principal and EC DoH were given copies of the research proposal. Authority to conduct the study was granted by both the principal of the NEI and the EC DoH. Permission was also requested from the heads of the five campuses where the study was

conducted. They all agreed and suitable dates for accessing each campus were planned (Polit & Beck, 2008: 184).

3.4.2.3 Informed consent

The basic principle for all research that involves human beings is that they should 'give informed consent' for their participation in the research. The researcher had to obtain an informed consent from the study participants. She therefore explained the research topic, the research question, aim and objectives and the conceptual framework of the study. This explanation was given for the participants to make an informed decision. The participants were given an opportunity to ask clarity seeking questions from the researcher. After the explanation the participants were given an opportunity to choose whether to participate or not to participate in the study (Polit & Beck, 2008: 171-172; Walker, 2010: 54-55). The participants who agreed to participate were given the consent form to sign (Polit & Beck, 2008: 177).

3.4.2.4 Risk/benefit assessment

The benefits of the study were communicated to the study participants. These benefits were possible improvements in the biological science performance. As the topic of biological science performance is sensitive to the nursing students due to the unsatisfactory performance associated with it, the researcher had to be very polite in handling it to avoid any emotions that could arise. That is the researcher had to be alert for any emotional disturbance that could arise (Polit & Beck, 2008: 174-175).

3.4.2.5 Maintenance of confidentiality

The participants were assured about the maintenance of confidentiality. That is any data that is obtained from them would be treated with strict confidence. That is the data would not be presented or dealt with in a recognizable form. This meant that no participant's name or institution

name would be revealed (Bell, 2010: 49-51). The recorded material was kept under strict control all the time (Polit & Beck, 2008: 180).

3.4.2.6 Debriefing

The participants were given an opportunity to ask questions and share their concerns after the data collection process. This was done to allay any anxiety caused by the data collection process (Polit & Beck, 2008: 182).

3.5 CONCLUSION

In this chapter the qualitative, contextual, exploratory and descriptive design was used to explore and describe the factors influencing the academic performance of students in the subject biological science at the NEI in the EC province. During this study, semi structured interviews were conducted to collect data from a consecutive sample of second year nursing students studying biological science. The sample was obtained from the five campuses of the NEI. The data obtained from the interviews was analysed through content analysis.

The researcher ensured that the study was ethical by requesting permission to conduct the study from the relevant authorities. Informed consent, confidentiality and debriefing were other ethical considerations that were observed.

In Chapter 4, an overview of the research findings and literature control will be presented.

4 RESEARCH FINDINGS AND LITERATURE CONTROL

4.1 INTRODUCTION

In Chapter 3 the research design and methods in this study were discussed in depth.

The questions asked in the self-reported interview schedule (view Annexure C) were guided by the 4-D cycle of AI. The first 3-Ds (Discover, Dream and Design) of the 4-D cycle were utilised to address Objective 1: To explore and describe the factors influencing the academic performance of nursing students registered for the subject biological science. The discussion of the findings will be presented in Chapter 4 as well as supportive literature obtained during the literature control.

The fourth D (Destiny) in the 4-D cycle addressed Objective 2: To make recommendations to stakeholders to enhance the academic performance of biological sciences. The researcher made recommendations based on the findings from the data collected in the first 3-Ds. The recommendations will be presented in Chapter 5.

4.2 OVERVIEW OF THE RESEARCH FINDINGS

The researcher facilitated an AI process at a specific NEI during which the second year students provided input regarding their peak experiences, wishes, challenges as well as their shared vision and recommendations relating to the subject biological science. Information gathered from the self-reported interview schedule, field notes and reflective diary were

analysed and the findings were organised in relation to the 4-D cycle of AI utilised to answer the two objectives that directed this study.

To address objective one in a systematic manner, the first 3-Ds of the 4-D cycle are utilized to guide the discussion.

Discovering the best of "what is"

An overview of the research findings relating to "Discovering" are summarised in Table 4.1. The research findings are based on the following question was asked to second year nursing students (participants):

Reflecting back on your four year programme what was your most satisfying/peak experience with regard to biological science? (Please write me the story).

Table 4.1 Summary of the themes, categories and sub-categories of Objective 1.

Themes	Categories	Sub-categories
4.2.1 Content	4.2.1.1 Increased knowledge base	<ul style="list-style-type: none"> Normal body is different systems Functions of the normal body Understanding of interrelated subjects
	4.2.1.2 Improved skills	
	4.2.1.3 Link with previous knowledge	<ul style="list-style-type: none"> School subject First year biological science
4.2.2 Nurse educator characteristics	4.2.2.1 Dedicated, supportive and passionate educators.	

Themes	Categories	Sub-categories
4.2.3 Study strategies	4.2.3.1 Use of drawings 4.2.3.2 Fun 4.2.3.3 Group activities 4.2.3.4 Hard work	
4.2.4 Resources	4.2.4.1 Prescribed books 4.2.4.2 Study guide	
4.2.5 Assessments	4.2.5.1 Formative assessments	<ul style="list-style-type: none"> • Application test • Quiz tests • Assignments
	4.2.5.2 Summative assessments	<ul style="list-style-type: none"> • Passing first year biological science

As seen in Table 4.1 five themes emerged from the question that was asked from the second year nursing students relating to objective 1 of AI. These themes were content, nurse educator characteristics, study strategies, resources and assessments. Each of these identified themes, categories and sub-categories where applicable would be discussed in Sections 4.2.1.1 to 4.2.1.5. These themes, categories and sub-categories would also be linked to relevant literature.

4.2.1 THEME 1: CONTENT

As evident from Table 4.1 the nursing students indicated the content of biological science as an interesting aspect of the subject. Some regarded its content as straightforward, practical and easy to understand. Biological science was perceived to be an important subject because it is the basis of knowledge for those who want to become professionals in the health and medical professions.

Supportive quotations relating to **content** were as follows:

"...Studying about the anatomy of our bodies was the peak experience, knowing how you breathe, eat, excrete, grow, see, hear, smell, taste was the best experience...."

"...Biological science is a major subject in terms of health or medical challenges where you will have to know all the physical body parts of a person."

"...I have found biological science to be a very interesting and satisfying subject..."

Literature control: The content that was of interest according to the nursing students was the subject matter covered in biological science, namely, anatomy, physiology, chemistry, biophysics, microbiology and parasitology. Biological science equips the nursing students to understand the normal structure of the human body, its functioning, the relevant chemical and biophysical aspects of the body and the aspects of the micro-organisms and parasites that can affect the human body (SANC Guide, 1994:5). This content is essential for building a strong scientific background for nurses (Melichair & Fairman, 2010:8). According to Armstrong (2010:175) in her chapter 'Managing the quality of the educational programme' the course content is an important aspect of quality education programmes. Therefore, the content should be relevant to the needs of the community in order for nursing students to be well equipped to meet these community needs.

As seen in Table 4.1 the three categories pertaining to 'Content' that were derived from the nursing students' self-reported interview schedules were *increased knowledge base*, *improved skills* and *link with previous knowledge*. These categories are discussed in Sections 4.2.1.1 to 4.2.1.3.

4.2.1.1 Category 1: Increased knowledge base

The content of biological science was viewed positively by the nursing students as it increased their knowledge regarding the structure and functioning of the human body.

Supportive quotations relating to their *increased knowledge base* were as follows:

"...my first satisfying experience was to know more about the human body..."

"...knowing about the nature of ourselves as created by God was a good experience..."

"...the most satisfying experience about biological nursing science is to read [learn] about human being[s], anatomy and physiology of [a] human being..."

"...being able to know what is happening inside my body..."

"..when a patient has got a fracture we know the type of bone because of BNS [Biological Nursing Science]..."

Literature control: The Commission of the European Communities (2007:3) states knowledge is "*the key to future growth, jobs and social cohesion in the EU*". Education and training is therefore essential for the development of this knowledge. According to this commission there should be greater investment and commitment towards effective and efficient education for purposes of increasing knowledge. Hall (2005:[34]) points out that a theoretical and a practical knowledge base that promote the rendering of quality patient care is essential for nurses. Nursing knowledge is the basis for the care rendered to patients; thus nursing knowledge is what classifies nursing as a profession. Nursing knowledge, for example, biological science knowledge will help nurses to justify their

actions. Qualified nurses need to engage in “*continuous professional development*” because nursing knowledge is dynamic (Hall, 2005:[35]).

Table 4.1 shows that from the category ‘Increased knowledge base’ three sub-categories emerged, namely, *normal body is different systems*, *functions of the normal body* and *understanding of interrelated subjects*.

- **Normal body is different systems:** The study of anatomy made the nursing students knowledgeable about the different systems that form the structure of the body.

Supportive quotations relating to *normal body is different systems* were as follows:

“... to know exactly the parts of the human body, where they are situated and how they are functioning...”

“...It [biological science] is a very interesting subject because the more you study it the more you get a picture of knowing yourself anatomically...”

..

“...During the first year I managed to get to know how our bodies are formed, created, how our bones are aligned and how they grow...”

“...It [biological science] helps us as the students to know the internal structures of the body...”

Literature control: Knowledge of the normal body as formed by the various systems is part of bio-scientific knowledge. Bio-scientific knowledge is essential for nurses as it is the foundation of their understanding of the physical problems of patients and the implementation of the nursing process to address these problems. Bio-scientific knowledge promotes the nurse’s knowledge of the rationale for

the patient's problems and nursing practice. Therefore, biological science knowledge is a critical aspect of nursing education (Choi, 2001:8).

Research in biological science has a significant impact on the health care system as it promotes an improved understanding of illnesses. Although the multidimensional view of the patient includes the social and psychological aspects, Rudy and Grady (2005:88) opine that most patient problems are biological in nature. According to Kim Van (2010:7), biological science knowledge promotes seeing the bigger picture when making clinical decisions.

- ***Functions of the normal body:*** Physiology promotes knowledge of the functions of the body and a number of body processes. Examples of these body processes, as mentioned by some nursing students, were urination, child birth, hormone functions, and the effects of the nervous system on the entire body.

Supportive quotations relating to the *functions of the normal body* were as follows:

"...Biological and natural science has been a subject that exposes us to the functioning of the human body..."

"...It [biological science] is very interesting to get to know your body parts and the way the whole body functions..."

"...It [biological science] makes us to know each part has its work to do, which parts are important to cause the body to move, to taste, to hear, to see..."

"..It [biological sciences] gave me insight on how an individual grows and matures physically..."

Literature control: Human physiology as indicated by Guyton and Hall (2011:3) is a presentation of “*the specific characteristics and mechanisms of the human body that make it a living being*”. Human beings remain alive due to normal but complex physiological processes which allow them to see, sense, feel, and think. The nursing students seemed to find the physiological aspects of biological science very interesting and informative. The functions of the normal body (physiology) relate to the basic elements like the cell, tissues, organs, and all the body systems and how the body organs and systems complement each other in their functions. Experiments are even conducted on animals to observe the effects of the removal of certain organs. These experiments promote the understanding of pathophysiology. The relationship between physiology and pathophysiology is crucial for nurse training because nurses must understand the effects of malfunctioning body parts to plan appropriate nursing care (Fox, 2011:1).

Curiosity about the structure and functioning of our bodies is a normal experience for all human beings. As communicated by the nursing students, from children to adults show interest in the way the body functions. For example, small children inspect their fingers, pulling at it and looking at it, and pull at arms and ears of those around them. Boys especially are fascinated when they pass urine. Adults verbalise unhappiness when their hearts beat faster. Therefore, anatomy and physiology is of interest to all people and not only to those in the medical or health care field (Marieb, 2005:2).

- ***Understanding of interrelated subjects:*** The nursing students indicated that, through biological science where understanding what is normal is learnt, an understanding of the abnormal is promoted in subjects like general nursing science and pharmacology.

The following quotations support this finding of the nursing students’ *understanding of interrelated subjects*:

"...I am to take the theory and apply it in practical situation and to other subjects like GNS [General Nursing Science] and Pharm [Pharmacology]..."

"...In my opinion we cannot detect abnormalities without knowing what is normal..."

Literature control: Cohen and Wood (2000:3) state anatomy and physiology are the basis for the understanding of all diseases that affect humans. Therefore, it is important to know the human body, the intricate way in which it functions, and the manner in which it is affected by illness. Diseases are caused by the many aspects that upset the structure and functioning of the body. Thus, understanding the structure and functioning of the body promoted a better understanding of those subjects that deal with the disease processes as stated by the nursing students in this study. They indicated that these are subjects like General Nursing Science (GNS) and Pharmacology.

The understanding of interrelated subjects through the application of biological science knowledge is linked to integrated learning, as pointed out by Johnston and McAllister (2008:417). In their integrated approach, Johnston and McAllister integrated biological science with other subjects in the nursing curriculum. This integrated approach emphasised the value of anatomy and physiology in the clinical practice environment (Johnston & McAllister, 2008:418).

4.2.1.2 Category 2: Improved skills

Improved skills were the second category under the first theme, 'Content'. Some nursing students indicated that biological science knowledge enhanced their patient care functions through applying it in nursing practice.

Supportive quotations relating to *improved skills* included the following:

"...for us to be able to nurse the patient in ICU we need to know the biochemistry..."

"...it is very easy when you are in the ward or clinic to identify the patient's problem and naming its location..."

"...even in clinical areas we see it and implement and apply it as it is happening daily..."

"...it has been a source of medical terminology which I use in the working environment..."

"...when I am in the clinical areas it helps me to know exactly what the problem is when I am taking history from the patient; when I am drawing nursing care plans..."

Literature control: Biochemistry, as mentioned by some nursing students, was part of their biological science studies. It deals with the knowledge of the biochemical processes of the body, in other words, it deals with the body as it "*works as a chemical system*" (Baynes & Dominiczak, 2005:1). Biochemistry is the science that deals "*with the chemical constituencies of living cells*" (Murray, Granner & Rodwell, 2006:1). For human beings to be healthy they need to have normal biochemical processes (Murray et al., 2006:2). Biological science provides the nurse with the critical skills to monitor the biochemical processes of critically ill patients; these are the processes that are closely monitored when nursing critical ill patients in an Intensive Care Unit (ICU).

According to Jordan, Davies and Green (cited in Kim Van, 2010:3-4), despite the fact that students stress about biological science because they find it difficult, they feel it is relevant to clinical practice. This supports the

term 'bioscience' which relates to the linking of biological science to clinical practice. It is therefore obvious that knowledge of biological science is essential for clinical practice since this knowledge improves communication with other members of the multidisciplinary health team. In other words, as Kim Van (2010:5) notes, it improves the communication skills of the nurses through the use of correct terminologies.

Jordan and Reid (cited in Johnston, 2010:222) state anatomy and physiology support the nurse's understanding of the clinical aspects of nursing and nursing skills. This view is supported by the findings in Johnston's study (Johnston, 2010:224). The student nursing participants in Johnson's study indicated that exposure to cadaveric material improved their insight to clinical skills such as, for example, administering an intramuscular injection. The students had a clear understanding of preventing hazards like damaging the sciatic nerve.

The nursing students in the current study acknowledged that nurses who have good biological science knowledge have better clinical skills. They therefore supported the view that the nurse educators should facilitate nursing students' knowledge in the subject so that theoretical knowledge can be applied in clinical practice (Asselin, 2011:125).

4.2.1.3 Category 3: Link with previous knowledge

This was the third category of the 'Content' theme. The nursing students were positive about linking biological science to their previous knowledge as this linkage promoted a better understanding of biological science.

Supportive quotations relating to the *link with previous knowledge* were as follows:

"It [biological science] is also not that different from biology at Grade 12."

"BNS in my second year is more understandable because of my first year experience."

Literature control: Linking currently unknown content with previously known content is in line with moving from the simple to the complex during studying. This movement from the simple to the complex promotes understanding of the subject as indicated by the nursing students in this study (Lombard, Snyder-Duch & Bracken, 2002:601). The new knowledge should always be linked to the student's existing knowledge to enhance academic performance (Gravett, 2001:14).

This previous knowledge is also known as 'prior knowledge'. Prior knowledge refers to the information already known by the students before they are introduced to new knowledge. The activation of prior knowledge through assessing it brings the student's brain in a state of readiness for the new knowledge. Prior knowledge gives the background for processing and understanding the new knowledge (Principal Kendrick, 2007:1; Shellyakins, 2011:1;). Prior knowledge is an essential aspect of teaching and learning; therefore, it should be taken into consideration during curriculum development (Otera & Nathan, 2008:1).

As illustrated in Table 4.1, the category '*Link with previous knowledge*' rendered two types of prior knowledge sub-categories, namely, *school subjects* and *first year biological science*.

- **School subjects:** According to some nursing students a foundation based on school life science had a very positive influence on their academic performance in biological science.

Supportive quotations relating to link with *school subjects* were as follows:

"...first year level work is interesting as it covers most of the work done at Grades 10, 11 and 12..."

"...it is more or less like biology that I did at school, so to me biological science studies are good and I am enjoying them, even this year I will pass..."

"...Biological science studies have been an interesting extension from biology work which was done in high school before coming to a tertiary level..."

Literature control: The above views of the nursing students are supported by literature which indicates that high quality admission criteria with subjects like English, mathematics and biology have been found to promote success in nursing education programmes (Gilmore, 2008:123; Newton, Smith, Moore & Magnan, 2007:145). Wolkowitz and Kelly (2010:501-502) found the subject science to be the best predictor of success in nursing programmes followed by subjects like communication and mathematics. Therefore, for nursing students to be successful in nursing programmes depends on the prior understanding of related sciences. In fact, it seems as if prior knowledge of sciences could improve student performance in nursing programmes and particularly in subjects like biological science.

In school the subject biology is the study of living things and the human being is one of these living things. The study of school biology also involves learning about viruses, bacteria and fungi (van Rensburg, van Wyk & Roux, 2001:1). The aforementioned are all aspects also studied by the nursing students in biological science. The relevance of prior knowledge of school biology to help the nursing students with biological science studied at the NEI is obvious.

- **First year biological science:** The nursing students indicated that the second year biological science was more understandable as it was based on first year work. In other words, the correlation of the first and second year work made the second year content more understandable.

Supportive quotations relating to link with *first year biological science* were as follows:

"...most satisfying peak experience was when I started doing second year, everything was clear as I could correlate the information from first year with the one I am doing in second year, I feel I understand biological science more this year than the previous year...."

"...in [the] second year I have found BNS to be fun, I have such a good year mark..."

Literature control: Literature supports the fact that greater prior knowledge of content promotes better understanding of further subject content. In fact, "*Appropriate prior knowledge within specific domains benefits student learning and achievement.*" (Alexander & Judy; Dochy, Segers & Buchi cited in Thompson, 2004:778). Thompson's (2004:779) view that prior knowledge has a facilitating effect on learning in terms of forming a foundation for new learning was found to be true in the current study since the nursing students conveyed that prior knowledge of first year biological science content promoted a better understanding of the second year content.

All these content categories and sub-categories, when applied appropriately, could enhance the nursing students' performance in biological science.

4.2.2 THEME 2: NURSE EDUCATOR CHARACTERISTICS

Some nursing students indicated that there were certain characteristics of their nurse educators that were impacting positively on their biological science performance. These were grouped under the theme, 'Nurse educator characteristics'.

The following quotations relating to *nurse educator characteristics* support this finding.

"...she [the lecturer] is doing her job of following students trying to find out about their challenges and problems..."

"...she [the lecturer] will repeat and repeat until you understand and if you don't understand she gives you a task on the work then you give feedback to her..."

"...she [the lecturer] is a mother, she is a friend, a colleague and a lecturer..."

Literature control: In a study by Colker (2008:1-2) a number of early childhood educator characteristics were stated. Teachers that participated in Colker's study indicated that teachers need to be knowledgeable about the subject matter: "*take a personal interest in each student, establish a caring/loving/warm atmosphere and show enthusiasm with students*". In addition, Colker adds educators should be good with planning and organising.

In Colker (2008:3-4) a summary of positive educator characteristics are given. An educator should have a passion of what he or she is doing; he or she should be a lifelong advocate for quality education. He or she should be willing to take risks in order to achieve the educational outcomes. Furthermore, educators should have patience and should

compromise when the need arises, that is, “*setting for small wins*” in order to get to the bigger picture. Educators should be flexible towards change and be creative in their facilitation of learning and, finally, educators should respect their students.

Authenticity (“*knowing who you are and what you stand for*”), being energetic, demonstrating a love of learning and a sense of humour were other characteristics Colker (2008:5) noted to be essential. Although Colker indicated these characteristics as applicable to early childhood educators, they are in fact applicable in all educational settings. Johnson (2009:1), for example, describes good educators as “*compassionate, thoughtful, knowledgeable, influential, and excited about teaching and learning*”. All of these characteristics are categorised under the ‘3Rs’ which represent the characteristics of an outstanding educator: “*rigor, relevance and relationships*” (Johnson, 2009:1) ‘Rigor’ as an educator characteristic entails an educator that emphasises the “*core competences*” of the curriculum. A rigorous educator engages the students in critical thinking and problem solving activities through teamwork. These rigorous educators ensure that when students complete the course they are “*independent readers, thinkers and writers*” (Johnston, 2009:1).

Relevant educators connect the course content to the skills and needs of the professional life of the students. These educators make the course content meaningful by engaging the students in activities that promote active participation. Also, a caring relationship prevails in the class of an outstanding educator. In this caring class there is mutual respect between the educator and the students. The application of the “*3Rs, rigor, relevance and relationships*” in the teaching/learning environment could bring about excellent student performance (Johnston, 2009:1).

One category emerged from the theme ‘Nurse educator characteristics’ namely *dedicated supportive and passionate educators*.

4.2.2.1 Category 1: Dedicated, supportive and passionate educators

The nursing students portrayed their nurse educators as dedicated, supportive and passionate.

Supportive quotations relating to *dedicated, supportive and passionate educators* were as follows:

"...our lecturer is such a devoted person, she is devoted to her work such that she never passes to the next content without making sure we all understand the content we were doing...."

"...she [the lecturer] is a motivating woman; because of her I have great marks..."

"...I have a lecturer not so young a woman who is very passionate about BNS..."

Literature control: According to Together (2007:[5]), student focus success programmes are essential for improving the academic performance of the students. Harrison (2009:363) maintains that student success programmes should include a good educator/learner relationship. This relationship is enhanced by educator characteristics such as her or his knowledge of the subject, influencing the learners positively, guiding them with goal setting, positive communication skills, assisting students with the development of study skills, and grooming them to become lifelong learners.

Dapremont (2011:258) found in a study that support and encouragement from faculty members were essential for improved student performance and completion of the academic programme. With faculty support and encouragement students managed to perform well academically even when family problems discouraged them. In other words, students'

performances improved when the educators were nurturing them personally and academically. Therefore, a holistic support from the educators influenced the students' performances positively. Positive interaction between the educators and students instilled confidence in the latter which they also experienced as empowering. Positive educator comments were motivating to the students. Conversely, any lack of positive, motivating and encouraging support from the side of educators could have a negative influence on students and even discourage them (Dapremont, 2011:258).

According to Valiga (2010:428), for nurse educators to instil excellence in their students they should be passionate about nursing education and demonstrate their passion. Nursing students should be able to see, feel and experience nurse educators' passion for teaching and love of the subject.

As evidenced by their comments, the nursing students of the NEI in the EC experienced the support, dedication and passion of the educators at the NEI in the EC as a factor that influenced their biological science performance positively.

4.2.3 THEME 3: STUDY STRATEGIES

Some of the satisfying biological science experiences of the nursing students were grouped under the theme 'Study strategies'. The students indicated that some of the strategies they applied to study biological science impacted positively on their performance.

Supportive quotations relating to study strategies were as follows:

"...it is the best subject to read and you don't have to memorise it, you just have to read it and in conjunction with organs, you have to know them and label them and then you can know their functions..."

"...there were students who were helping us to understand the subject, like there was a student who used to understand it more than us, so that student was helping us by all means..."

"...studying something you experience in your body..."

Literature control: A learning strategy (study strategy) is described by Rubin (cited in Griffiths, 2004:2) as the technique used by a student to gain and understand the course content. Students should not be given answers but should be taught how to find or come up with the answers themselves; they must be empowered to manage their own learning

Vermunt and Vermetten (2004:378-379) observe four categories of learning strategies, namely, "*undirected, reproductive-directed, meaning-directed, and application-directed*". These strategies are found in various contexts. As nursing is more an application focused profession, nursing students should use more application-directed learning strategies. Moore (2006:9) advises that students should engage in active activities during learning instead of just listening. Bonwell and Eison (cited in Moore, 2006:9) indicate that students should be engaged by educators in activities like "*dialog, debate, writing and problem solving, as well as higher order thinking*". Other activities that students could participate in are group discussions, presentations, debates, role plays, field experiments, and case studies (Moore, 2006:10). In Biggs' (2006:33) view, intrinsically motivated students use study strategies that organise and give meaning to the subject matter.

As shown in Table 4.1 four categories pertaining to study strategies were derived from the nursing students' self-reported interview schedules: *use of drawings, fun, group activities, and hard work*. Each of these categories is discussed individually in Sections 4.2.3.1 to 4.2.3.4.

4.2.3.1 Category 1: Use of drawings

The use of drawings during study time facilitated understanding of biological science and improved performance.

Supportive quotations relating to *use of drawings* were as follows:

"...when our teacher told us to draw diagrams and she looked at them she would laugh at our diagrams not knowing that drawing these diagrams really helped us when writing tests and examinations because we remember them the way they are in the book..."

"...the most satisfying experience about biological science is that it has pictures and so that makes it a bit understandable..."

"...for me what I like about BNS is that it has diagrams, so whenever you study you always look at diagrams which make it easier to understand..."

Literature control: According to Ormanci and Sasmaz-Orem (2011:16), the use of drawings in learning the digestive system is a constructivist based approach to learning instead of the memorisation of facts. Drawings provide the students not only with the knowledge of the various organs but also how they relate to each other. Therefore, students should be encouraged to use drawings as a way of reinforcing knowledge of the various systems of the body. To enhance academic performance students should name, describe, and draw the various biological science organs that form the different systems. This will also augment their knowledge of the shapes of the organs and their connection to each other (Ormanci & Sasmaz-Orem, 2011:20).

Prokop, Tuncer and Chuda (2007:293) conducted a study on Slovakian students' attitudes towards biology as a subject. The results indicated that the use of practical work can increase interest in biology. It is thus possible that an increased interest could result in improved performance.

Making use of drawings as a form of practical work can promote interest in biological science and hence improve academic performance.

4.2.3.2 Category 2: Fun

Some nursing students indicated that they enjoyed joking about biological science terminology as it promotes understanding and improved performance. Fun through the use of the joking games enhanced their biological science performance; their understanding of biological science terminology was bettered.

Supportive quotations from the nursing student participants relating to the *fun* element were as follows:

"...with my colleagues we joke about the names, such as call bones by their names, for example my occipital or parietal has a fracture or I think I have a fractured T3, that was enjoyable..."

"...It was amusing sometimes when the lecturer will perform certain movement[s]..."

"...we have to use medical terms but when you are in [a] clinical situation you found out all you were studying in anatomy and physiology is there even those difficult terms become interesting..."

"...I enjoyed BNS lessons like the lady who teaches it and enjoys her jokes..."

"...I have found BNS to be so [much] fun..."

Literature control: A positive, humorous environment as indicated by the NEI nursing students joking about biological science terminology was also indicated in an article by Chabeli concerning the promotion of successful learning (Chabeli, 2008:58). According to Ash (2011:2), fun

has been brought into learning by educators who use games during their facilitation of learning. Moreover, students found the experience of learning through games as fun and entertaining; in fact, students who played some facilitation games performed better in their assessments. This reflects that having fun by making use of games to facilitate learning can improve nursing students' academic performance.

Additionally, Reams and Bashford (2009:31) showed in their research that the use of puzzles of the digestive organs for an illustration of the steps of the digestive system in science education was experienced by learners as fun and rendered positive results. Another way of having fun while learning was role play. Wittmann-Price and Godshall (2009:215) found that role plays or 'concept acting' was another method of facilitating learning through the use of fun. Fun through role plays promoted critical thinking and co-operative learning.

Laughter from humorous stories shared in class can promote positive and conducive learning environments. Laughter can help anxious students to relax; it can help to promote remembering certain aspects of the content which students may find difficult to understand. Gravett (2001:44) adds that laughing about the inappropriate integration of theory and practice can promote understanding of the appropriate integration.

4.2.3.3 Category 3: Group activities

Group activities where nursing students support each other were mentioned as being helpful towards enhancing their performance in biological science.

Supportive quotations relating to *group activities* were as follows:

"...I thank also my fellow students who are so good in group activities..."

"...my group mates also made [helped] me to pass because they always try to explain and they do not move to the next chapter until I understand..."

"..in my [My] first [year]BNS was a challenge for me. I learnt to overcome it by studying in groups and discussing this subject..."

"... through group studies I have managed to cope..."

Literature control: Support provided by studying in groups as revealed by the nursing students in this study was similarly viewed as impacting positively on academic performance by literature. Researchers such as Rogers (2010:99) and Reams and Bashford (2009:30) point out students can succeed if they collaborate to form support groups and participate actively in their learning.

Ward-Smith, Peterson and Schmer (2010:81) cite the following advantages of group activity in their article on students' perceptions of group projects: group activities can promote understanding of the course content and ease the studying process. Sharing of the work through study group activities can decrease stress which can hinder learning. Furthermore, group study activities can promote face to face contact, friendship, positive interpersonal relations, and co-operation with others. It can increase the students' confidence to succeed, enhance social skills like trust building, negotiation, and resolving conflicts. Skills to work in leadership roles and with multidisciplinary teams can be developed in group activities. Gravett (2001:48) adds that group studying promotes listening and reflection about the content studied. These skills mentioned are essential for studying as it does not only enhance academic performance significantly, but acquiring it is critical to work as a qualified nurse (Ward-Smith et al., 2010:81).

Moreover, participation in group activities is crucial for nursing students in training and should be encouraged by educators because, as Kinyon, Keith

and Pistole (2009:165) ascertain, in the nursing domain nursing activities are achieved through team work. According to Feingold, Cobb, Givens, Arnold, Joslin and Keller (2008:222), students value group learning activities. These authors maintain that group activities promote students' use of concepts and through these activities students are able to address complex application problems through discussions; it also helps them to determine the rationale for their answers. Trueman (2011:185) notes that the millennial students need collaborative teaching and learning strategies as well as the use of technology for enhancement of team and individual learning.

4.2.3.4 Category 4: Hard work

Some nursing students in this study revealed that hard work delivered rewarding outcomes in their biological science performance. They communicated that obtaining high biological science marks after having worked hard was satisfying.

The following supportive quotations relating to *hard work* are depicted below:

"...that was great knowing that if I put more effort in it I get the best results..."

"...when and if it's time to study it is time to study and nothing else..."

"...BNS is easy to pass as well if you put [in] more effort..."

"...I studied BNS for 3wks [weeks] revising all the chapters..."

Literature control: Good academic performance is achieved through hard work and proper time management. To maintain an excellent academic performance a student needs to plan enough time for studying amid personal and social activities (Reinecke, 2007:2).

Educators should motivate their students by emphasising that they will be successful in their studies if they work hard and persist. It is important that students remember that hard work involves the use of different study strategies. A student who works hard understands that there is more work to be done and covered. To become a nurse practitioner requires hard work and it should therefore be seen as part of learning since only through working hard and putting in effort in learning and studying can success be achieved. It takes time and hard work to achieve anything (Department of Education and Early Childhood Development, 2009:2).

4.2.4 THEME 4: RESOURCES

The use of resources like prescribed books and study guides was found useful by some nursing students. They indicated that using these resources during studying improved their biological science performance.

Supportive quotations relating to *resources* were as follows:

"...First know the drawings and then go through the book, check [the] objectives of the subject..."

"...What is satisfying about BNS is that all the information in the study guide is in the prescribed books..."

Literature control: The resources referred to by the students were the learning resources. A "*learning resource*" is "*any resource used by teachers and students for the purpose of learning*" (OECD study on digital learning resources as systematic innovation, 2009:4). A wide range of resources – ranging from simple to complex – are available that can be used to enhance teaching and learning. Some examples include resources for group learning, study guides, resources for problem-based learning, workbooks, laboratories, computers, and videos. Educators and the

students should observe the good practices of using these resources for the purpose of enhancing learning (Harrison, 2008:[1]); OECD study on digital learning resources as systematic innovation, 2009:4).

Two categories emerged from the theme 'Resources', namely, *prescribed books* and *study guides*. These categories are discussed in Sections 4.2.4.1 and 4.2.4.2.

4.2.4.1 Category 1: Prescribed books

The use of a clear, simple, understandable and straight forward prescribed book with drawings and examples yielded good biological science results for some nursing students.

Supportive quotations relating to *prescribed books* were as follows:

"...the prescribed book is user friendly and interesting..."

"...the book that we are using is very clear and the conditions we come across are those that we have seen and learnt in our books..."

"...Ross and Wilson is easy to understand you can even read on your own and understand without a lecturer..."

"...then the book I am using, it is very understandable and straight forward. It provides diagrams and examples in order for us to understand whatever is explained there. It has also tables for summaries of the content..."

Literature control: Research done at the University of Nevada in the USA emphasised the value of access to books in order to increase academic achievement (Miller, 2010:[1]). According to Rogers (2010:99), for students to succeed in academic programmes they should mobilise

their own resources, for example, acquiring prescribed books must be organised by the students themselves.

4.2.4.2 Category 2: Study guides

There were nursing students who felt that the biological science study guide was helpful in guiding them towards understanding biological science.

The following quotations relating to *study guides* were written by the nursing students:

"...even this year I will study it according to the study guide and I will pass my BNS with flying colours..."

"...it helps me a lot to use [the] study guide as my guidance to this subject..."

"...I thank those who prepared the way of studying with study guide..."

"...I still study according to the study guide and I pass[ed] my BNS with flying colours..."

Literature control: According to Meyer and van Niekerk (2008:99), a study guide "*guide learners in mastering scientific material in a systematic manner.*" The outcomes as outlined in a study guide give students "*an overall perspective of what is expected from them on completion of each study module.*"

Harrison (2008:[13]) explains that a study guide guides the students on what to learn, how to learn, and what will be the indication that they have mastered that particular content. The purpose, for example, as a learning resource for a specific subject, for which a study guide is developed

determines its content. For a study guide to be useful it should be evaluated periodically. Those using the study guide should evaluate it in terms of areas that are useful and areas that need improvement(s) to render it a useful tool for learning.

4.2.5 THEME 5: ASSESSMENT

A number of nursing students who participated in this study indicated their satisfaction with regards to biological science assessments. They reflected that their performance in certain biological science assessments contributed positively to their entire biological science performance.

Supportive quotations relating to *assessment* were as follows:

“...had enough time to study due to the study week and we were writing the subject first...”

“...it was nerve wrecking waiting for the results but I passed both papers. I have gained more positivity and I stayed focussed.”

Literature control: Assessment, according to Bruce, Klopper and Mellish (2011:305), are a means of obtaining data about the student’s performance towards the achievement of the programme outcomes. Centra (2007:60) names different types of student assessment like tests, examinations, and quizzes. These differ according to the content covered and its comprehensiveness with examinations being more comprehensive than the other two. Tests have limited scope as it covers work that was done during a particular period in the course of the year (Centra, 2007:60). Tests form part of formative assessments while examinations are known as summative assessments (Bruce et al., 2011:305-306).

Two categories emerged from the theme ‘Assessments’, namely, *formative assessments* and *summative assessments*. These categories

together with their sub-categories are discussed in Sections 4.2.5.1 and 4.2.5.2.

4.2.5.1 Category 1: Formative assessments

The nursing students indicated a number of formative assessments that had a positive influence towards their biological science performance.

Supportive quotations relating to *formative assessments* were as follows:

"...I remember my first class test, I got a whopping [whopping] 48% and man, wasn't I disappointed in myself, I told myself right there and then that this would not happen again and it never did..."

"...we are writing tests after every system so it is easier for us to study..."

"...my most satisfying experience is that OSCE of the bones [application test], it was very interesting and now I know all the bones in my body..."

Literature control: According to Bruce et al. (2011:305-306), a formative assessment is an assessment during the process of learning. It is done to assess the progress of the student towards the achievement of the module and programme outcomes. Chan Koh (2010:206) states formative assessments are done to assess students' readiness for the summative assessments. Formative assessments of high quality could have beneficial effects on learning (Chan Koh, 2010:205). According to Centra (2007:60), tests or formative assessments have four functions. Firstly, the evaluation of student learning; secondly, tests motivate students to learn and plan for their studies and, thirdly, tests assist educators to evaluate themselves as to how well are they presenting the course content. Finally, tests reinforce learning through the feedback given to the students.

Formative assessments are part of the teaching and learning process. It provides information as to whether the students have understood a particular part of the content and at a point when revision can be done to achieve the educational outcomes. Formative assessments are a form of practice as it offers valuable information about student learning. It assists in providing feedback throughout the learning process and is a form of a facilitation strategy adopted by good educators. Active engagement between the educator and the students is further promoted through these assessments thereby positively influencing the academic performance (Garrison & Ehringhaus, [n.d.]:[1]).

Three sub-categories emerged from the category 'Formative assessments'. They were *application test*, *quiz tests* and *assignments*.

- **Sub-category 1: Application test:** The nursing students described this test as easy, enjoyable, and exciting and it improved their year marks. It is a biological science practical formative assessment which is also called a 'viva'. At the NEI this test is written by first year nursing students. The nursing students are provided with a written test to which they must respond orally by identifying bone structures.

Supportive quotations relating to *application tests* were as follows:

"...the application tests whereby I saw all the bones..."

"...application test made me know all the bones, cells and tissues..."

"... when I did the viva last year in May..."

"...the viva which includes studying of bones..."

Literature control: According to Cryer ([n.d.]:[1]), the viva is widely used. For degree programmes it is used to improve the marks of borderline students. It is used to measure the student's understanding of the subject through his or her ability to explain the subject matter verbally. As the viva is used to improve marks for borderline students, it

therefore could improve academic performance. In addition, the viva is used to obtain feedback from the students about the performance of the organisation.

- **Sub-category 2: Quiz tests:** The nursing students of campus E explained a quiz test as a test that they wrote after completion of every chapter. They communicated that the setting of short quiz tests encouraged studying; writing this test after every chapter facilitated self-study of all the work covered in class every day. Nursing students from campus A also indicated that writing a test after every system made it easier for them to study.

Supportive quotations relating to *quiz tests* were as follows:

“...I am very satisfied that now there has been an introduction of quiz test in every chapter...”

“...that the lecturer give[s] us some quiz or class work to check or test us on that content that we were doing...”

“...In [our] second year our lecturer introduced quiz test tests and that helped me a lot because it gave me a challenge of studying...”

Literature control: Quizzes are short tests that can be written in less than fifteen minutes (Centra, 2007:60). In the view of Garrison and Ehringhaus ([n.d.]:[2]), the strategy behind quiz tests is to facilitate asking questions. They argue that it provides students with the opportunity to think deeper about the content covered thereby increasing their comprehension of the work. In this way quiz tests provide valuable information with regard to student learning. Centra (2007:18) agrees and states the value of a quiz test lies therein that it assists with the evaluation of a student’s understanding of the work.

- **Sub-category 3: Assignments:** Assignments were regarded by a few nursing students as promoting a better understanding of biological science. These nursing students indicated that assignments also assisted them to obtain higher year marks.

Supportive quotations relating to *assignments* were as follows:

“...also assignments helped me get a DP for the final examinations...”

“...also assignments helped me to have more understanding...”

Literature control: In Bruce et al. (2011:217) an assignment is defined as a “*learning task*” that is allocated by an educator to students and “*may include reading assignments, case assignments, portfolio assignments and exercises for practising a skill*”. Its purpose is to ensure that learning needs and outcomes are met by the students. Assignments are marked by the educator and feedback is given to the student. As was written by the nursing students in this study, their assignments formed part of the formative assessment process and marks were allocated (Bruce et al., 2011:218-219).

Quality feedback for the assignments must be given as soon as possible since this ensures learning; the students’ work is still fresh in their minds and they are therefore receptive to feedback. Alternatively, if feedback is for some reason not given quickly, the answers to the assignment must then be discussed to ensure learning is facilitated. The students must be given more practical “*real world*” assignments with timeous constructive feedback to improve performance (Centra, 2007:15).

4.2.5.2 Category 2: Summative assessments

The nursing students indicated their happiness and satisfaction for having passed the biological science summative assessments.

Supportive quotations relating to *summative assessments* were as follows:

“...then I started to improve in the BNS and I managed to pass at the end of the year...”

“...not having to carry a subject to the next level was a peak experience...”

“...I was pleasantly surprised when it was quite understandable in the exam paper...”

“...in the first year it was the first exposure to this subject but I studied and passed...”

Literature control: According to Bruce et al. (2011:306), a summative assessment is done at the end of the semester or year. Its purpose is to measure whether the student has achieved the outcomes of the programme and is ready to proceed with another module or proceed to the next level of study.

A summative assessment is also known as an examination and it “*is the most comprehensive form of testing*” (Centra, 2007:60). The summative assessment must comprise different types of questions like multiple choice questions, true/false questions, matching type questions, short answer questions, and essay questions. Different types of questions test the students’ knowledge and comprehension as well as their application, analysis, synthesis, and evaluation of the knowledge (Centra, 2007:62-63).

One sub-category emerged from the category ‘Summative assessments’, namely, *passing first year biological science*.

- **Sub-category 1: Passing first year biological science:** The nursing students were happy that they had passed first year

biological science and were registered as second year nursing students at the time the study was conducted.

Supportive quotations from the nursing students relating to their joy of *passing first year biological science* successfully are indicated in the block below.

"...passing BNS in [my] first year was the greatest experience of all time..."

"...seeing my number with a pass next to it was the best..."

"...my real good experience was passing the first year examination without expectation of doing [expecting to do] so..."

"..the first time I passed BNS1, [I] got a 53%, you don't have any idea, I did not sleep a whole week with excitement ..."

Literature control: According to Yorke (cited in Goldfinch & Hughes, 2007:259), one reason why a number of students withdraw from their studies at first year level is failing first year subjects. At the NEI in the EC nursing students who have failed biological science twice at first year level must withdraw from the training programme (NEI Policy, 2007:10). Naturally, the nursing students in the current study were therefore pleased to have passed first year biological science as it meant they did not have to withdraw from the training programme.

Dreaming “*what could be*”

An overview of the research findings relating to “Dreaming” are summarised in Table 4.2. The research findings are based on the following question was asked to the second year nursing students (participants):

What are your wishes for the subject biological science?

Table 4.2: Summary of the themes, categories and sub-categories of “dreaming”

Themes	Categories	Sub-categories
4.2.6 Educational resources	4.2.6.1 Practical application opportunities	<ul style="list-style-type: none"> • Biological science laboratory
	4.2.6.2 Applicable learning resources	<ul style="list-style-type: none"> • Computer laboratory • Visual aids – videos/posters • One understandable text book • Additional resources • Library facilities
4.2.7 Increased (100%) pass rate		

As presented in Table 4.2, two main themes emerged from the second question asked to the second year nursing students (participants). These themes were *educational resources* and *increased (100%) pass rate*. Each of these identified themes, categories and sub-categories where applicable are discussed in Sections 4.2.6 to 4.2.7. The themes, categories and sub-categories are linked to relevant literature.

4.2.6 THEME 6: EDUCATIONAL RESOURCES

The nursing students from all the campuses wished for a variety of educational resources that could enhance their understanding of biological science.

Supportive quotations relating to the wish for *educational resources* were as follows:

"...get more resources that can help in understanding the subject..."

"...need more resources to pass BNS..."

"...when I see I may remember and when I take part I will learn..."

"...to have enough equipment or material to show when teaching so as to make the subject more and more interesting..."

Literature control: There is high financial spending on teaching and learning resources, especially where technological resources are concerned. Yet, it is not easy to calculate direct return on investment on money spent on teaching and learning resources. The value of these resources is that they should contribute to the achievement of the desired learning outcomes (Mott & Granata, 2012:1).

Educators and learners can contribute and also benefit from a number of educational resources that are available, and globally continuously developed, on the internet. This is a platform where educators and learners can share their expertise on educational resources (The Cape Town open education declaration, [n.d.]:1).

The nurse educators are also an important educational resource. The NEIs need the nurse educators to perform educational activities. Therefore, the

work that is done by nurse educators must be managed effectively and efficiently (Swanepoel, Erasmus & Schenk, 2010:3).

As seen in Table 4.2 two categories emerged from the theme 'Educational resources', namely *practical application opportunities* and *applicable learning resources*.

4.2.6.1 Category 1: Practical application opportunities

The nursing students wished for educational resources that could promote the practical application of the content of biological science.

Supportive quotations relating to *practical application opportunities* were as follows:

"...to do more practical work more than theory..."

"...practical things that we can learn from..."

"...my wishes for biological science are that we do more practical things in class..."

"...visual equipment will help in acquiring knowledge..."

Literature control: The nursing students' wish for technological resources is supported by Lynch-Sauer, VandenBosch, Kron, Gjerde, Arato, Sen and Fetters, (2011:518) who state that technology can have a positive impact in facilitating and strengthening nursing education. According to Harris, Krause, Gleeson, Peat, Taylor & Garnett (2007:1), practical work is an important part of learning in a number of disciplines. Practical hands-on activities could complement the theory presented in lectures.

One sub-category emerged from the category 'Practical application opportunities', namely, *biological science laboratory*.

- **Sub-category: Biological science laboratory:** The nursing students wished for a biological science laboratory where they could actually see the biological science structures.

Supportive quotations relating to a *biological science laboratory* were as follows:

"...it would be great to have [a] biological science laboratory where everything would be reflected..."

"...laboratory so that we can see all the things we learned about..."

"...I wish that there should be also a school laboratory to show the chemistry side of the subject..."

"...I wish we could have a laboratory on the premises..."

Literature control: According to Johnston and McAllister (2008:417), simulation is one method of learning anatomy and physiology. "*Simulations in education are designed to mimic real-life situations...*" (Johnston & McAllister, 2008:418). Simulations provide the students with opportunities to practice skills without any fear of jeopardising patient safety. Simulation provides rigour and quality in clinical education (Johnston & McAllister, 2008:418).

The wish expressed by the participating nursing students of the NEI to have a biological science laboratory, is positive and practical. Such a laboratory will afford the nursing students extensive opportunities for the advancement of learning. Simulations can contribute significantly to learning anatomy and physiology; students can dissect material and their knowledge of both the scientific knowledge and ethical aspects of patient

care can be enhanced. The ethical aspects can include aspects of humanity and morality (Johnston & McAllister, 2008:419).

In Johnston and McAllister's (2008:420) study the use of laboratory facilities in the learning of anatomy and physiology was greatly valued by the majority (97%) of the students. In the current study the nursing students were convinced that laboratory biological science facilitation would promote a better understanding of the material presented in lectures. It was their stance that nursing students needed more practical approaches towards learning about and understanding anatomy and physiology.

The dissection of cadaver material and computer assisted learning are examples of the biological science practical learning opportunities that can be conducted in a biological science laboratory. Johnston and McAllister (2008:419-420) affirm that the time spent in dissection rooms to gain more knowledge and understanding of anatomy and physiology was valued by the students in their study.

Complete organs and pieces of tissue used by the nursing students for dissection can be kept in the biological science laboratory. Animal organs, for example, lungs and kidneys can be used in the biological science laboratory where it can be preserved in preserving solutions like formalin. Bruce et al. (2011:243) note anatomy and physiology educators and students alike have indicated how valuable these organs and tissues are when studying these particular two subjects. According to Johnston (2010:222), exposure to cadaver material can also improve academic outcomes of biological science.

4.2.6.2 Category 2: Applicable learning resources

The nursing students wished for various learning resources that could promote the application of biological science knowledge.

Supportive quotations relating to *applicable learning resources* were as follows:

"...if we can have extra learning resources ..."

"...I wish we could have some kind of animated pictures of the conditions we study..."

"...more footage like videos must be part of the subject because to see something the student will remember it better..."

"...extra study material..."

Literature control: Learning resources are essential for the provision of quality education. Implementing various different learning resources is crucial to meet the educational needs of large groups of students. Modern technological advances show a positive inclination towards advancing education; e-learning, for example, is perceived as an effective educational resource (Braslavsky, 2004:2; Franklin, Peat & Lewis, 2001:64; Karampiperis & Sampson, 2005:128).

According to Braslavsky (2004:2-3), the learning resources must be useful in the entire learning context of the student. It should not only be interesting and provide relevant information but the students must also enjoy using these resources. The students' learning should be in line with global issues. It is furthermore important that the resources are understood and be interesting to the educators. Therefore the educators have to stay updated. If they are interested and up-to-date and enthusiastic, then this is what they will relay to the students. Any resources chosen to be used should ultimately promote interaction between the learners, educators and the learning environment.

Five subcategories emerged from the category 'Applicable learning resources', namely, *computer laboratory, visual aids like videos and*

posters, one understandable textbook, other resources, and library facilities. These sub-categories are discussed next.

- **Sub-category 1: Computer laboratory:** The nursing students felt that the availability of a computer laboratory would promote internet access. Having access to computers and the internet would encourage daily research on biological science.

Supportive quotations relating to *computer laboratory* were as follows:

"...if we can be supplied by internet [have access to the internet] to do more research at our campus..."

"...get a good approach when studying it for instance to use computers..."

"...use [the] internet through computers..."

Literature control: Bruce et al. (2011:245) state the use of computer technology in different fields of nursing is called "*nursing informatics*" which means nursing science is combined with computer science. For educators and student access to computers or then a computer library is essential. The internet is used as an important resource to stay up-to-date with current developments and research material in a specific field or pertaining to a particular topic. Educators can use computers to prepare valuable teaching material; students can obtain additional information and gain more knowledge from other research studies that, in turn, can assist them to prepare their assignments. If students have access to computers they will be more motivated to acquire additional knowledge and improve their academic marks. It has been found in literature that adequate levels of motivation can result in improved and positive academic performance (Pintrich, 2004:385; Pintrich & Zusho, 2007:731; Teller, 2007:155; Weller, 2005:2).

Researchers like Kaveevivitchai, Chuengkrai, Luecha, Thanooruk, Panijpan and Ruenwonga (2009:66) assert that computer assisted learning in anatomy and physiology will have a positive influence on academic outcomes since the gap between theory and practice is significantly reduced. According to these researchers, biological science must be integrated with the practical issues of learning. They found that simulation laboratories were an excellent resource for active, multisensory, and computer assisted learning.

- **Sub-category 2: Visual aids – videos/posters:** The nursing students wished for visual aids like videos to view biological science structures.

Supportive quotations relating to *visual aids* were as follows:

“...be taught even by means of video uses so as to give a clear picture to the learner...”

“...have videos where we can see these parts with our eyes...”

Literature control: An NEI can develop its own videos, CDs and DVDs for use during the process of teaching and learning. The advantage of self-developed visual aids is that they are appropriate for the learning needs of the specific group of students. Educational videos can also be bought by the NEI. However, as Bruce et al. (2011:240) warn, it is important to remember that if patients appear in the videos ethical principles like privacy should be observed. According to Armstrong (2010:156) in her chapter ‘Managing physical and financial resources for quality nursing education’, nurse educators can prepare excellent visual aids by making use of computer programmes like PowerPoint.

- **Sub-category 3: One understandable textbook:** Some nursing students also wished for one prescribed book. It was even indicated by some of them that a specific textbook, namely Ross and Wilson,

should be used. Some even wished that the examination would only be based on Ross and Wilson.

The supportive quotations with regard to *one understandable textbook* are indicated below.

"...please use one prescribed book e.g. Ross and Wilson..."

"...I wish all the studies come out on the exams from Ross and Wilson because it's simple when you are reading, its [it's] more understandable than Marriebs..."

"..one prescribed book e.g. Ross and Wilson..."

Literature control: According to Bruce et al. (2011:241), textbooks are a valuable learning resource, especially if it is accompanied by a CD and have drawings and tables that make them interesting to study. Educators need to consider these aspects when choosing prescribed and recommended books. They should also consider how suitable the book is in terms of meeting the course outcomes. In Braslavsky's (2004:2) view textbooks are still the most valuable resource in education. According to Bruce et al. (2011:241), textbooks as a form of printed text can provide the student with "*more information than that which the educators can present in the class and lecturing setting*".

- **Sub-category 4: Additional resources:** More skeletons for the large numbers of nursing students, more bones, projectors, and improved demonstration rooms were wished for. The nursing students felt that to 'see' while they simultaneously 'hear' would be more useful and productive than just listening without 'seeing' what is being discussed.

Supportive quotations relating to *additional resources* were as follows:

“...My wish is that we should have enough equipment to learn from, like skeletons and all the organs of the human body so as to learn from what we are seeing....”

“...I wish that there will be more equipment for BNS practical (anatomy – the bones) so that the next student should have enough bones to practice [with]....”

“...I wish for lecturers to use more visual aids when teaching biological science so that they are not only teaching about that particular system but also show them because sometimes pictures stay in the mind more than words and it makes it more interesting, then in that way students will be more eager to learn biological science....”

Literature control: Bruce et al. (2011:243) assert that “*modified real objects are a valuable learning resource*”. These are objects like bones that have been removed from the body for learning purposes. They are useful as they do not need to be preserved and can be painted in various colours to indicate various structures, for example, the muscles.

Posters developed by the students can promote active participation in learning and enhance the achievement of learning outcomes. These posters can be in the form of large notices where small pieces of information are presented in an attractive and educational manner (Bruce et al., 2011:242). Managers must also organise and allocate different types of educational resources in order for educators and learners to achieve their goals (Robbins & DeCenzo, 2005:11).

- **Sub-category 5: Library facilities:** Some nursing students wished for well-resourced libraries with books and other reading material specifically focusing on biological science.

Supportive quotations relating to *library facilities* were as follows:

"...have a special library that will consist [stock] biological science books mostly..."

"...to have libraries for referring and getting more knowledge..."

"...to be provided with libraries and more different types of books..."

"...library to get more information..."

Literature control: As stated by Armstrong (2010:157) in her chapter 'Managing physical and financial resources for quality nursing education', a library with up-to-date books is an important aspect of learning. Stakeholder involvement with regard to books that can be provided for the library is essential. Libraries should provide access to information for both students and educators. Quality education depends on quality use of library facilities by both students and educators. Well-resourced library facilities is a warehouse for knowledge that can enhance teaching and learning (Agboola & Bamigboye, 2011:[1]).

4.2.7 THEME 7: INCREASED (100%) PASS RATE

The nursing students in the current study wished to dedicate themselves in studying biological science so as to achieve an increased pass rate up to 100%.

Supportive quotations relating to an *increased pass rate (100%)* were as follows:

"...I wish that Biological science students put in a lot so that they can pass it, it is not a difficult subject, all we need to do is put an effort and we will all make it..."

"...I wish I could pass the Biological science with 70–100%..."

"...for BNS to have a 100% pass rate..."

"...I also want the subject to be amongst the subjects which are passed the most and enjoyed the most by the students..."

"...I wish that everyone in my class can pass biological science..."

Literature control: Kotzé (2010:179) observes that a pass rate gives an indication of the students who are competent with regard to the content of a course. The pass rate is influenced by a number of factors, namely, *"the difficult level of the examinations, the amount of preparation by the students, the ability of the students, the standard of teaching and the availability of resources"* (Kotzé, 2010:179). According to an article in the Chatham Star Tribune (2012:1), an increased pass rate can be achieved through hard work by both the educators and the students.

The improved pass rate from 67.8% to 70.2% in the 2011 matric results in South Africa coupled with the increase in the science pass rate was exciting to the politicians, the entire public and especially the learners. This increased pass rate was even praised by President Zuma (Indian Ocean's Leading [IOL] news, 2012:1; South Africa. Info, 2012:1).

Designing “what ought to be”

An overview of the research findings relating to “Designing” are summarised in Table 4.3. The research findings are based on the following question was asked to second year students:

What is your vision for the subject biological science?

Table 4.3: Summary of the themes, categories and sub-categories of “Designing”

Themes	Categories	Sub-categories
4.2.8 Programme structure	4.2.8.1 Workload reduction	<ul style="list-style-type: none"> Semester course Two or three examination papers Increase number of years Major subject
4.2.9 Change attitudes	4.2.9.1 Students	<ul style="list-style-type: none"> Positivity Dedication Enjoy and love biological science
	4.2.9.2 Educators	<ul style="list-style-type: none"> Dedication Knowledgeable No criticism
4.2.10 Assessments	4.2.10.1 Improved setting	
	4.2.10.2 Scope for examinations	

As seen in Table 4.3 three main themes emerged from the answers provided by the nursing students. These themes were programme structure, attitude change, and assessments. Each of these identified themes, categories and sub-categories are discussed in Sections 4.2.8 to 4.2.10. The themes, categories and sub-categories are linked to relevant literature.

4.2.8 THEME 8: PROGRAMME STRUCTURE

The nursing students' vision was the restructuring of biological science content to enhance a manageable workload.

Supportive quotations relating to *programme structure* were as follows:

"...it should be made more understandable and easier so all students can pass it..."

"...is the great subject that I wish that you could make it more easy to understand..."

"...to make it a subject that is not a challenge..."

"...the subject should be taught with its abnormalities in each system..."

"...less theory and more practical..."

Literature control: Academic programmes can "*benefit from an on-going process of inquiry and reflection*" that focuses on "*continuous improvement*" (Lindholm, 2009:4). The programme must therefore be assessed to determine whether it meets the learning outcomes of the students (Lindholm, 2009:17). Ndong-Jatta (2007:11) views "*collective reflection*" by the relevant stakeholders as regards the provision of quality educational programmes as an important aspect of learning. Moreover, research is essential for guiding programme development and structuring (Ndong-Jatta, 2007:16). Educational programmes should be dynamic and take into account educational and societal needs. There should be an attention on continuous "*improvement and updating*" of the educational programmes (Tuning, [n.d.]:[6]).

The vision of the nursing students in the current study that focused on the restructuring of the biological science programme was in line with the views, findings and recommendations found in literature.

As seen in Table 4.3 the only category that emerged from the theme 'Programme structure' was *workload reduction*. This is discussed in Section 4.2.8.1.

4.2.8.1 Category 1: Workload reduction

The nursing students' vision involved some re-arrangement of the biological science content for purposes of reducing its workload.

Supportive quotations relating to *workload reduction* were as follows:

"...my vision for the subject is try and reduce the workload that comes with it..."

"...would like to see the content not as huge..."

"...the questions can be changed to 50 marks [for] each paper not 100 marks..."

"...maybe to make it a separate course, for example a bridging course towards the 4D course..."

"...we should only be taught the basics about the subject..."

Literature control: Ndong-Jatta (2007:17) states academic programmes are overloaded with curriculum activities. The curriculum overload warrants programme restructuring to allow time for creativity among the students. There should be periodic evaluations of the strengths and concerns regarding educational programmes for purposes of implementing appropriate curriculum changes (Lindholm, 2009:5). The concern raised by the NEI nursing students was curriculum overload; for this their vision was the reduction of the workload. Educational programmes should be structured in such a way that there is a balance between learning outcomes and the workload. "*The curriculum should not overload students with excessive and redundant content*" (Tuning, [n.d.]:[4-5]). Expounding on this view, Ndonga-Jatta (2007:29) adds research should be conducted

into aspects of the curriculum that are “*worth teaching and learning*” to avoid curriculum overload. The amount of work to be covered for examinations can be overwhelming. Therefore, students should set some measurable and realistic goals for themselves (Pettinger, 2012:1).

Four sub-categories emerged from the category workload reduction: *semester course, two or three examination papers, increase number of years* and *major subject*. These sub-categories are discussed in the next section.

- **Sub-category 1: Semester course:** Some nursing students had the vision that biological science should be made a semester course.

The following supportive quotes relate to the sub-category *semester course*:

“...BNS should be a semester course...”

“... be written in twice a year in June and in October...”

“...must be taught in first semester and by June will be [the] final [examination] then [the] second semester that is from June to October...”

“...if we can have exam from [in] June and December to half up the work [divide the work in two]...”

“...I would like for it to be written in semesters...”

Literature control: According to the Oxford Advanced Learner’s dictionary (2005) a semester means “*one of two periods that the school or college year is divided into*”. The academic work to be covered by the students in a year is therefore divided into these two periods thereby reducing the workload for the students. Student assessments could either

be done at the end of a module, a course, or a semester (O'Farrel, [n.d.]:7).

In literature it was found that the views of faculty members regarding the benefits of a semester model differ considerably. Although some were of the opinion that it would reduce the workload, others believed it would simply be a re-alignment of the work. Another problem faced was that there were faculty members who felt it would just double the workload for them as they would have to mark two examinations for the same subject in a year. Although the semester model would in fact double the work for faculty members it would reduce the workload for the students since the work written in June would not be repeated by the students in the November examinations (Wiles & Ribando, 2011:1-2). In addition, semester assessments are valuable in that they promote the assessment of smaller portions of the work within a short time after completion of the module (Kotzé, 2010:177).

- **Sub-category 2: Two or three examination papers:** As another workload reduction strategy some nursing students' vision was to have biological science divided into two or three papers.

Supportive quotations relating to *two or three examination papers* for biological science were as follows:

"...get 3 exam papers in final..."

"...1st for BNS to be divided into 2 papers..."

"...must be 1st and 2nd paper on BNS1..."

"...application test as first paper and theory as second paper..."

Literature control: The SANC Guide (1993:[i]) stipulates that each NEI must develop its own curriculum and send it to the SANC for approval. According to the SANC Guide (1993:17), an academic year course is the

equivalent of “90-120 teaching periods”. For a subject that covers “90-120 teaching periods” a 3 hour examination paper counting 100 marks must be written (SANC Guide, 1993:17). It would therefore be the responsibility of each NEI to divide the academic year examination papers into portions when compiling its curriculum. As mentioned before the most important aspect of the structuring of the curriculum is that it has to be submitted to the SANC for approval before it can be implemented.

- **Sub-category 3: Increase number of years:** Some nursing students envisaged increasing the number of study years for biological science.

Supportive quotations relating to *increasing the years* of study for biological science were as follows:

“...let it be taught up until the 4th year...”

“...To be taught throughout the four years...”

“...carried up to the end of the course...”

“...to be continued through even in [on] 3rd year level...”

Literature control: Curriculum reviews have been done to meet certain legal and quality requirements. In a study that was conducted in Washington, D.C. by the Centre on Education Policy (CEP) about curriculum changes around the No Child Left Behind Act (NCLB), it was found that 62% of the schools increased the time for English and mathematics as the compulsory subjects according to the NCLB Act (Centre on Educational Policy [CEP], 2007:1). Also according to Dezure, (2012:2) education is no longer focusing on mastery of broad areas of content, but it is concerned with competency. That is “*what students are able to do with what they know*”. In order to produce these competent practitioners Dezure (2012:2) indicates that curriculum content should be

presented in an integrated manner. As noted in the Australian Curriculum, Assessment and Reporting Authority [acara], (2012:15) there are subjects that can be taught across the years of schooling. This teaching across the years of schooling could bring about the integration of subjects and production of competent practitioners.

In South Africa the minimum number of years required by the SANC for the duration of studying biological science is “*at least two and a half academic years*” (SANC, 1985:4). An academic year, according to SANC Guide (1993:[i]), covers at least a period of 44 weeks in a year. The curriculum submitted by an NEI to the SANC for approval must indicate the duration of each subject and be in accordance with the prescribed minimum requirements. Consequently, any amendment such as increasing the years of study for biological science through integrating it with the major subjects of the comprehensive four year nursing programme must first be submitted for approval to the SANC.

- **Sub-category 4: Major subject:** Some nursing students indicated that biological science should be made a major subject or be integrated into one of the existing major subjects of the four year comprehensive programme.

Supportive quotations relating to biological science as a *major subject* were as follows:

“...the subject being [should be] made a major subject in our college...”

“...can be combined in one of the subjects we are studying as majors...”

“...to see nurses studying BNS as a major subject like midwifery and community [nursing]...”

“...it is also my vision to see the subject being made a major subject in our college...”

Literature control: According to the Free Online Dictionary a major subject is “*the principal field of study of a student at a university*”. It is therefore a field of study which has greater importance than others in that one cannot precede to the next level of study without passing it. It therefore stands to reason that students and educators should devote much time and energy to master and succeed in a major subject.

According to the participating nursing students of the NEI, biological science should be made a “*principal field of study*”. If approached as a major subject it would heighten the students’ attitude towards biological science in a positive way; it will result in students concentrating better, making more effort to understand its content, and ensure that they work harder to achieve success in the subject. Burns and Grove (2009:61) propose that scientific knowledge should be used as a tool in the practice of the art of nursing. Therefore, scientific knowledge should be regarded as an essential part of nursing.

According to the SANC (1985:3), the subjects of the four year comprehensive diploma should be presented in an integrated manner. Obviously then the integration of biological science into one of the other major subjects will conform with this particular stipulation of the SANC.

4.2.9 THEME 9: CHANGE ATTITUDES

The vision of the nursing students was a change of attitude towards biological science. This change of attitude was envisioned for both the students and the educators

Supportive quotations relating to *change of attitudes* were as follows:

“...everyone to change their perspective about BNS being “scary” and/or hard and try and see it in a positive manner...”

"...Being a subject taken positively by all the people..."

"... everyone develops a positive attitude and interest towards it..."

Literature control: An attitude is a result of "an evaluation of a person, object or idea" (Kevin, 2008:1). Attitude can be broken down into "affective", "behavioural", and "cognitive" components. These components involve an emotional reaction towards the "attitude object" (affective), actions that are a result of the "attitude object" (behavioural), and thoughts about the "attitude object" (cognitive) respectively. A combination of all these components creates the entire attitude about the object (Kevin, 2008:1).

It is important to realise that an attitude change does not occur overnight but takes time. However, what needs to be understood is that an attitude change is possible if one is committed to change his or her attitude. That is, there should be an attitude change commitment in one's thinking (Brownson, 2008:1). Attitudes and behaviours are contributory factors to academic achievement (Akey, 2006:1).

Two categories emerged from the theme 'Change attitudes', namely, attitudes of *the students* and those of *the educators*. These two categories are discussed in Sections 4.2.9.1 and 4.2.9.2.

4.2.9.1 Category 1: Students

The nursing students indicated that they needed to change their attitudes towards biological science.

The following quotations support the finding that a *change of attitude* by the *students* was necessary:

"...my vision is to assist my fellow students in changing their attitude with the module..."

"...I do see a change in our attitudes towards BNS from 1st to 2nd year."

"...the failure rate will go down if you study with a positive attitude, you will get positive results..."

"...after all if you can manage to pass other subjects BNS should not have to be a problem..."

"...to have students not seeing it as a monster..."

Literature control: Akey (2006:6) states encouraging an attitude of working together among the students promotes in them a better ability to individually deal with challenging educational objectives. Collaboration among the students can promote academic achievement. Therefore, the students' attitudes should be built towards peer group teaching since the latter can be a valuable teaching and learning method (Akey, 2006:6).

The attitude of students that will contribute to their success is that of engaging themselves in their educational work through putting more effort into it, paying closer attention, having positive values of learning, being enthusiastic, and being interested in learning (Akey, 2006:3). The students' attitude should be one of striving towards being autonomous students (Tuning, [n.d.]:[5]).

Three sub-categories emerged from the category 'Change of attitude' by the nursing students: *positivity, dedication, and enjoy and love biological science.*

- **Sub-category 1: Positivity:** The nursing students in this study indicated that biological science should not be 'feared' but should be viewed in a positive manner.

Supportive quotations relating to students having a *positive* attitude towards biological science were as follows:

"...to have a positive attitude towards it..."

"...learn to appreciate it..."

"...to be seen like other subjects and not to be feared..."

"...if you study with a + attitude you will get + results..."

Literature control: According to Sasson ([n.d.]:1), a positive attitude is a state of mind that must be developed or strengthened as it helps people to cope with the daily activities of life. It results in happiness and leads to success in life. A positive attitude is energising and promotes the achievement of goals. It generates inner power and strength thereby helping one to overcome difficulties and challenges (Sasson, [n.d.]:1).

The aforementioned aspects relating to a positive attitude are in line with the positive principle of AI which highlights that positive attitudes are physically and psychologically enriching and nourishing (Preskill & Catsambas, 2006:10). Akey (2006:4) reaffirms this positive principle by observing that, for students to succeed, they should be positive about success.

- **Sub-category 2: Dedication:** Another vision communicated by the nursing students was that dedication and hard work will render positive results and will improve one's biological science performance.

Supportive quotations relating to student *dedication* towards biological science were as follows:

"it is a real good subject but has to be given more concentration on..."

"...they should just work hard & with dedication..."

"...they need to put a lot of effort into it..."

"...is to strive to the excellence of the biological science..."

Literature control: According to the Oxford Advanced Learner's dictionary (2005), dedication means giving "a lot of your time and effort to a particular activity or purpose because you think it is important". A dedicated person is therefore someone who is committed to what she or he is doing. The vision of the nursing students in the current study was that they should commit themselves to studying biological science if they wanted to obtain satisfactory results.

In a study conducted by Rogers (2010:97) a student indicated that doing one's best during studying contributes to success. In the same study (Rogers, 2010:99) dedication was demonstrated by students completing the practice questions, attending workshops and other courses. Their dedication contributed to the students' academic success during examinations. In Planas (2009:512) the students cited self-determination as a contributory factor towards achieving academic success.

- **Sub-category 3: Enjoy and love biological science:** The nursing students' vision was that by enjoying and loving biological science, their performance in this subject would be improved.

Supportive quotations relating to students *enjoying and loving biological science* were as follows:

"...my vision is to see BNS loved by the students..."

"...my vision is to see everyone loving and passing the subject..."

"...all students should love and like it so as to pass it and also they need to enjoy it..."

"...to see all the students enjoying biological science..."

"...for it to be the most student friendly subject..."

Literature control: A quote from a student in the research by Rogers (2010:97) demonstrates the constructive impact that loving a subject can have: "*the programme is easier if you like it*". Also, Harrison (2009:363) found that having fun when studying a subject was indicated by the participants as a major contributory factor towards achieving academic success. Therefore, student friendly and joyful environments that could enhance learning should be created (Ndong-Jatta, 2007:26).

4.2.9.2 Category 2: Educators

A vision of a change of attitude towards biological science by nurse educators was indicated by the nursing students.

Supportive quotations relating to a *change of attitude* towards biological science by *educators* were as follows:

"...for the lecturers ... to stop telling first years that it is the most difficult subject..."

"...I would like to see the students and lecturers working together..."

Literature control: For the educators to inspire students to succeed in their educational endeavours, educators are expected to create an environment that promotes high quality teaching and learning. The educators should adopt an attitude and the will to create a student friendly and pleasurable environment which is conducive to the learning experience of students. In other words, the educator must support, show interest and encourage the student through demonstrating good interpersonal skills and by providing a caring, supportive, environment as this will inevitably promote academic success (Akey, 2006:1,5; Ndong-Jatt, 2007:26). Educators can foster a collaborative attitude among students by engaging them in role plays, debates, project completion, creating models, and conducting experiments (Akey, 2006:6). Educators should also adopt a positive attitude towards networking with other academics so as to broaden their scope of quality enhancement in education (Tuning, [n.d.]:[7]).

Three sub-categories emerged from the category 'Change attitude' by nurse 'educators' namely *dedication*, *knowledgeable* and *no criticism*.

- **Sub-category 1: Dedication:** The nursing students' vision was to be taught by dedicated educators. They wrote that this would have a positive impact on their biological science performance.

Supportive quotations relating to *dedication* by nurse educators were as follows:

"...get more tutors who are interested to facilitate it..."

"...Is for students and lecturers to both dedicate their time, be it spare time or work time to making a progress in BNS..."

Literature control: The sub-category 'Dedication' was discussed under the category 'Students' in the previous section (4.2.9.1). The students'

hope was that nurse educators should become more committed towards the facilitation of biological science.

The amount of faculty involvement with students was indicated as a contributory factor to success by the students in Rogers' (2010:98) study. Dedicated educators are undeniably more involved with students and, according to Harrison (2009:363), dedicated educators make students their priority.

- **Sub-category 2: Knowledgeable:** The nursing students expressed another vision of theirs, namely to be taught by knowledgeable educators who understood biological science as this would impact positively on their biological science performance.

Supportive quotations relating to *knowledgeable* educators are given next.

"...be taught by someone who is knowledgeable and who knows it [biological science] well..."

"...have lecturers who understand it [biological science]..."

"...by improving on lecturing qualities..."

"...my vision is to see more improvement on methods of teaching..."

"...also people who are facilitating the content to be more knowledgeable about BNS..."

Literature control: In the study by Harrison (2009:362-363) being knowledgeable was indicated as a characteristic of effective, good educators. The student participants in Harrison's study indicated that knowledgeable educators are resourceful. It is thus of the utmost importance that educators are exposed to new teaching and learning approaches through staff development programmes as this will enhance their existing knowledge considerably (Tuning, [n.d.]:[4]). According to Ndong-Jatta (2007:24), educational institutions should ensure that they

appoint professional educators with adequate academic qualifications and experience. In addition, these institutions should also invest in the continuous professional development of their educators but, conversely, educators themselves must continuously strive to acquire new knowledge throughout life (Ndong-Jatta, 2007:27).

- **Sub-category 3: No criticism:** Another vision of the nursing students was that educators should not to criticise them or indicate that they would be excluded from the course if their results are not satisfactory.

Supportive quotations relating to *no criticism* of students by educators were as follows:

"... infuse the learners with optimism and positive words that do not give us criticism like those that say you gonna be excluded [from the course]..."

"...to give the students freedom because they are afraid when they study this subject and that's what makes us fail because we study under some threats especially on the ancillary subjects..."

"...the teachers must give us support and they must not shutter our dreams and they must not be happy when we are being excluded..."

Literature control: Harrison's (2009:363) study revealed that students valued educators with good communication skills. According to Goetz (cited in Planas, 2009:512), encouraging words (not criticism) from educators can build the student's confidence and contribute to his or her academic success. In a study done by Planas (2009:512) a student commented that students are often confronted with negative criticism, for example: '*You have done this incorrectly*'. For this particular student, the power of hearing positive aspects even though she had failed a test played an important role in her evaluation of the competence and

educational skills of the educator. When the educator told the student that she could pass the test if she studied diligently, she was empowered by the educator's positive words and in the end passed all the tests (Planas, 2009:512). Akey (2006:4) agrees with Planas, stating a positive emotional state of mind can be created in a student by discouraging criticism which can, in turn, result in poor academic performance by the student.

4.2.10 THEME 10: ASSESSMENTS

The nursing students' vision was for some changes to be implemented towards the assessment practices at the NEI.

Supportive quotations relating to *assessments* were as follows:

"...that everyone can pass the subject..."

"...I just wish to pass the subject this year because I see it as an obstruction to many of our students to proceed to the following year..."

"...to be the best passed subject..."

"...all students 100% pass for BNS..."

Literature control: "Assessment of student learning outcomes" is considered an important criterion in evaluating the quality of educational programmes and the effectiveness of educational institutions (Lindholm, 2009:2). Under consideration in the assessment plan should be the different outcomes, namely, knowledge, skills, attitudes, and behavioural outcomes (Lindholm, 2009:8).

According to the World Declaration on Education for All (cited in Ndong-Jatta, 2007:10), "a clear definition and accurate assessment of learning

outcomes, including knowledge, skills, attitudes and values” is essential for quality education outcomes. Assessments should assess both deep and surface learning (O’Farrel, [n.d.]:5). There should be a closer relationship between learning and the manner in which it is assessed (Higher Education Authority, 2011:11).

Two categories emerged from the ‘Assessment’ theme, namely, *improved setting* and *scope for examinations* and they are discussed in Sections 4.2.10.1 and 4.2.10.2.

4.2.10.1 Category 1: Improved setting

The nursing students indicated that if the standard of setting could be improved it could result in an improved performance in biological science.

Supportive quotations relating to *improved setting* were as follows:

“...my vision for the subject is to change the strategy to set the examination.”

“...my vision is on changing the strategy of setting the examination...”

“...management must change the way of asking questions to an easier or an approachable way...”

Literature control: According to Meyer and van Niekerk (2008:111), the subject content need to be reduced to essential aspects during facilitation of learning. This reduction can be achieved through the formulation of learning outcomes.

The same learning outcomes can be utilised for setting tests and examinations. Each question set in an assessment should evaluate a certain learning outcome. Furthermore, there should be a balance between the cognitive levels set. The difficulty level of the question paper

should assess the abilities of the students while giving all of them an opportunity to pass; thus every assessment should be within the student's level of development (Meyer & van Niekerk, 2008:153,157).

According to the SANC's (2005:[16-17]) Self-assessment Tool, NEIs should have an assessment and moderation policy that guides its assessments. An assessment system that ensures valid, fair, and reliable assessments must be in place in all NEIs to ensure that educators conduct fair, valid and reliable assessments. It is also essential that assessments are moderated by qualified moderators to confirm that it meets the quality criteria.

4.2.10.2 Category 2: Scope for examinations

It was also the nursing students' vision to be given a scope for the examinations as they believed this would improve their biological science performance and assist them in preparing for the examination.

Supportive quotations relating to *scope for examinations* were as follows:

"...be given clear questions or sub-headings that may appear during examinations..."

"...lecturers must give us the scope to study..."

"...to be given scope before we write..."

"...to be given scope before writing the final examinations..."

Literature control: According to the Oxford Advanced Learner's dictionary (2005), a scope is a range of aspects to deal with. In the current study, the nursing students' vision of getting a scope for

examinations therefore meant they wanted a range of the content areas that would be covered during the summative assessments.

In Rogers' (2010:99) study practice questions were given to the students in order for them to prepare for the examinations. According to the SANC's (2005:[20]) Self-assessment Tool, assessment plans and guides should be communicated to the students. The Higher Education Authority (2011:13) points out that examination papers should have a "*desirable predictability*" by being clear and consistent in terms of "*testing the aims and objectives of the course*".

Delivering "*what will be*"

An overview of the research findings relating to "Delivering" are summarised in Table 4.4. The research findings were based on the following research question asked to the second year nursing students:

If you could make any recommendations or suggestions from a student's point of view to improve the outcomes in the subject biological sciences what will it be?

Table 4.4: Summary of the themes, categories and sub-categories of "Delivering"

Themes	Categories	Sub-categories
4.2.11 Management responsibility	4.2.11.1 Provision of resources	<ul style="list-style-type: none"> Nurse educators Material resources
	4.2.11.2 Revise admission criteria	<ul style="list-style-type: none"> Age
	4.2.11.3 Infrastructure	<ul style="list-style-type: none"> Suitable environment

		<ul style="list-style-type: none"> Nurses' home residences
4.2.12 Nurse educators' responsibilities	4.2.12.1 Competent nurse educators	
4.2.13 Students' responsibilities	4.2.13.1 Self-study	
4.2.14 Programme organisation	4.2.14.1 Balance content with time	<ul style="list-style-type: none"> More periods (morning periods) Extra remedial classes
	4.2.14.2 Study guide layout	
4.2.15 Assessment methods	4.2.15.1 More formative assessment opportunities	
	4.2.15.2 Reasonable examination questions	

As presented in Table 4.4 five main themes emerged from the question asked relating to "Delivering". These themes were: management responsibility, nurse educators' responsibilities, student responsibilities, programme organisation, and assessment methods. Each of these identified themes, categories and sub-categories are discussed in Sections 4.2.11 to 4.2.15. The themes, categories and sub-categories are then also linked to relevant literature.

4.2.11 THEME 11: MANAGEMENT RESPONSIBILITY

Some nursing students' recommendation for improving the performance in biological science involved certain responsibilities that must be taken by the NEI management.

Supportive quotations relating to *management responsibility* were as follows:

"...classes should be smaller..."

"...we are too many so more lecturers would be of good value for us..."

"...I could suggest that we as students be given resources as much [as much resources as possible/a variety of resources], which they may help us during studying..."

"...firstly the department should recruit lecturers that are suitable to teach the subject..."

"...train the lecturers that give the subject..."

Literature control: Management is a group of people within an organisation that is responsible for ensuring that the organisation succeeds in its objectives. If managers perform their responsibilities competently, organisations will succeed. Managers have the responsibility to make sure that the organisational activities are performed in an effective and efficient manner. The overall responsibility of management involves "*planning, organizing, leading and controlling*" the human and material resources of the organisation (Robbins & DeCenzo, 2005:7-8) whilst also securing the rendering of effective and efficient service to internal and external customers (Teicholz, 2001:1.7).

According to Ndong-Jatta (2007:5), it is critical that the structuring of programmes within the curriculum is well adapted to its context. The management of educational institutions must ensure that increased enrolments of students are closely associated with quality education. Quality education can be supplemented through the adequate provision of resources which is the responsibility of management (Ndong-Jatta, 2007:10).

Three categories emerged from the 'Management responsibility' theme: *provision of resources, revise admission criteria, and infrastructure*. These categories are discussed in Sections 4.2.11.1 to 4.2.11.3.

4.2.11.1 Category 1: Provision of resources

The nursing students recommended that more resources be provided to enhance their biological science performance.

Supportive quotations relating to *provision of resources* were as follows:

"...there must be enough resources to teach biological science..."

"... proper facilitation equipment ... make the subject more interesting as well as we could be able to perform experiments, search on internet for more information..."

"...biological nursing science to be more practical..."

"...and to have more models of the things to be studied..."

Literature control: Providing quality resources is a prerequisite for the provision of quality educational programmes. Management must therefore ensure that these resources, for example, quality academic staff, support staff, resources for teaching, and research, is available. (Tuning, [n.d.]:[4]).

According to the National League for Nursing (NLN) (2002:1-2), there is an almost 50% shortage of the required number of nurse educators in the country. This shortage is due to nurse educator retirements, an inadequate or a lack of graduate programmes for preparing nurse educators, and inadequate numbers of candidates enrolling in graduate programmes for preparing nurse educators. Management must provide funding for experienced neophyte nurses who demonstrate the skills and are interested to become nurse educators and follow a career in nursing education.

Two sub-categories emerged from the category 'Provision of resources', namely, *more nurse educators* and *more material resources*. These two sub-categories are discussed next.

- **Sub-category 1: Nurse educators:** The nursing students recommended that more nurse educators should be employed to cater for the large numbers of students. This employment would reduce the number of students in a class taught by a singular nurse educator.

Supportive quotations relating to *more nurse educators* were as follows:

"...divide [a] big class into two for individual attention, no one lecturer to teach 200 students..."

"...there should be more than one tutor for this subject at each level..."

"...more lecturers to relieve workload for our lecturer..."

"...to get more tutors for this subject..."

Literature control: Geyer (2010:88) in her chapter 'The formal education and training environment' states if the quality and quantity of nurse educators is inadequate it would be impossible to offer quality nursing education programmes. The shortage of nurse educators in the country at the moment is aggravated by the retirement of ageing educators (Reinhard & Hassmiller, 2009:335). According to the International Centre on Nurse Migration (eBrief, 2010:[1]) the acceptable nurse educator student ratio is 1:25 for theory and 1:8 for practical. Management should therefore employ adequate numbers of nurse educators to meet the approved ratio. The employed nurse educators should also meet the minimum qualification requirements for the position that they are employed in (SANC Self-assessment Tool, 2005:[2]).

- **Sub-category 2: Material resources:** There were also recommendations for the provision of more material resources like simulation and computer laboratories and visual aids.

Quotations from the nursing students in support of the provision of more *material resources* were as follows:

"...library is needed..."

"...demonstration room is needed..."

"...also the library is highly needed..."

"...if we can have library and laboratory that can help..."

"...have more visual aids when teaching..."

"...have a lab at school to do more practical things and be hands on..."

Literature control: It is a quality requirement from the SANC that an NEI should have all the necessary resources that are relevant to the programmes that are offered. These are resources like classrooms and laboratory facilities, clinical laboratories, teaching and learning aids, and library facilities (SANC Self-assessment Tool, 2005:[5]).

Management should also ensure that technological resources are made available as recommended by the nursing students who participated in the current study. In fact, as Ndong-Jatta (2007:23) argues, incorporating technology into the learning processes can augment learning; for this reason management should ensure that technology is part of the content learned and also part of the learning environment.

4.2.11.2 Category 2: Revise admission criteria

One nursing student made the following recommendation regarding the issue of the *revision of the admission criteria* at the NEI:

“...Admit students that are from school so [as] they understand quickly [quicker/faster] as [if] compared to adults...”

Literature control: According to Gilmore (2008:121), to improve their outputs NEIs should endeavour to admit students who demonstrate the greatest potential for success. Setting high quality admission criteria is the most appropriate and suitable approach to enrol such students. High admission scores in subjects like English, anatomy, physiology and mathematics were found to contribute significantly to nursing students' success rates in nursing programmes (Gilmore, 2008:123). Biology is another important subject where having insightful knowledge can contribute to success in health related higher education courses (Muwanga-Zake, 2010:4).

Newton et al. (2007:147-148) identify an institution's admission criteria as one of the main indicative factors of whether success in nurse training will be achieved or not. They postulate that, if the admission criteria are taken seriously by an NEI it would admit more nursing students who show capability and will thus have more graduates. Moreover, admission criteria that clearly identify the abilities of the prospective nursing students can assist in curriculum planning and retention strategies for those students that are at risk of attrition.

One sub-category emerged from the category 'Revise admission criteria', namely, *admit young nursing students*. It is discussed in the following section.

- **Sub-category 1: Age:** The admission of younger rather than old students was recommended by one nursing student”

"...to admit students that are not old..."

"...it will be nice to have more young students..."

Literature control: The issue of age as a predictor of success in nursing programmes rendered conflicting results in literature. Some research studies indicated older nurses were more successful in their studies while others revealed younger nurses had more favourable study outcomes (Blackman, Hall & Darmawan, 2007:223). In a study by Grave (2010:16) it was found that older students above 28 years showed a lower performance when compared to students younger than 28.

Rabbit (cited in Gravett, 2001:5) observes the momentum of learning slows down with age. A younger person may observe, think and act faster than an older one. Despite these differences in speed, Rabbit also found the older persons were accomplished learners. Gravett's (2001:8) stance is that the experiences brought by older people to the learning environment can help them to achieve the learning outcomes.

The qualified nurses currently in practice are getting older. Younger qualified nurses are desperately required both in clinical practice and as educators at the NEIs (Reinhard & Hassmiller, 2009:335).

According to Geyer (2010:88) in her chapter 'The formal education and training environment', there are concerns about the quality of the students recruited by the NEIs. Some of the recruited candidates are of a mature age while others are young. When recruiting, the age of the candidates, their academic qualifications, personality aspects, and people skills must all be considered. Although the older, more mature student could be more focused and responsible, they might not stay in the profession for long but retire after a short period of time. On the other hand, the advantage of the younger generation is that they will stay in the profession for a longer period after having completed their studies.

However, the concern about these young recruits is that some may not value nursing as a calling but are only attracted by the stipend.

Kotzé (2010:187) observes that the nursing students recruited by the NEIs are usually in their late adolescence or in the early adulthood stage of life. According to the recruitment and selection guidelines of the EC NEI, age is a criterion for the selection of nursing students: the age limit is 17 to 35 years for those who are not nurses at the time of enrolment and up to 45 years for those who are nurses – the latter pertaining to enrolled nursing auxiliaries and enrolled nurses wanting to study the four year comprehensive nursing programme. Academically, English and life science are compulsory. Other science subjects like mathematics and physical science are awarded a higher status during the selection process (NEI Recruitment and Selection Guidelines, 2009:1).

The principles of adult learning should be observed in NEI classes where there are young and older nursing students. These principles should include the recognition and utilisation of the experience brought by these nursing students into the learning environment. Self-directed and problem-based learning should also be used (Gravett, 2001:65).

4.2.11.3 Category 3: Infrastructure

Some nursing students recommended that some infrastructural issues should be attended to.

The following two supportive quotations relate to issues regarding the *infrastructure*:

“...Provide us with more facilities for studying...”

“...Good environment for learning...”

Literature control: Management in educational institutions must ensure that resources are available for the enhancement of learning and this includes the infrastructure. When management is budgeting, it must also be decided how much money should be made available for the infrastructure (Ndong-Jatta, 2007:25).

The minimum infrastructural requirements for each educational institution must be identified. These requirements must include security, quality, and comfort (Llizaliturri, 2002:5). The planning of educational infrastructure should involve all the relevant stakeholders like the community members, architects, builders, educators and students. The educational infrastructure should cater for advances in technology like internet access (Llizaliturri, 2002:9) and be developed in conjunction with equipment requirements, maintenance and operations in place (Llizaliturri, 2002:18).

Two sub-categories that emerged from the 'Infrastructure' category, namely, *suitable environment* and *nurses' home residences* are discussed in the following sections.

- **Sub-category 1: Suitable environment:** Some nursing students' recommendations revolved around the provision of a good learning environment; in other words, suitable classrooms must be provided.

The following quotation supports the recommendation for *suitable environment*:

"...especially the classes do not have electricity so there is a scarce place for studying during the night..."

Literature control: Armstrong (2010:156) emphasises the importance of providing suitable buildings for "educational, administrative and management activities" in an NEI. Quality education does not only depend on the professional and knowledgeable educators, but the environment

itself contributes to successful learning. It is impossible for any student to do his or her best in an environment which is not conducive to learning, therefore classrooms must be located in a sturdy building; all the necessary equipment must be in working order and regular maintenance must ensure that it remains in working order. After all, as Kotzé (2010:187) observes, the classroom is one of the primary environments where teaching and learning take place. Therefore, to render quality education necessitates functional, suitable classrooms. This means there should be sufficient funds made available and best practices should also be in place for managing and maintaining the condition of the classrooms: cleaning and making necessary repairs. Where classrooms are inadequate management should initiate plans for improving the conditions of the classrooms (University of California, 2006-2007:1). High quality technology that is updated regularly should be installed in classrooms (University of California, 2006-2007:8-9).

- **Sub-category 2: Nurses' home residences:** To enable the nursing students to study after hours a nursing student recommended that repairs be made to the nurses' homes. The following quotation supporting this finding is noted below:

"...Repair the nurse's [nurses'] home so that the students will have a place to study after hours..."

Literature control: The health science students' residence are usually situated close to the classrooms and laboratories which gives them easy accesses to the practical areas. This is also the case with Disa residence at the University of the Western Cape where a variety of health science faculty students live. A common residence for health science faculty students can promote interactive group study sessions after hours. The lower ground level of the Disa residence is connected to the hospital by a tunnel that allows the students to have easy access to the practical areas. Access to practical areas promotes integration of theory and practical

which is essential for competency in health science subjects (Residence Disa, [n.d.]:[1]).

Additionally, the ideal residences for nursing students' should have study facilities that include enough study rooms with a study desk and a chair and a study lamp (Neema, 2003:54). Safety in these residences should be ensured through the provision of security personnel, fire safety material, and good quality doors and locks (Neema, 2003:52). Management should have policies in place to deal with academic challenges that may arise in the nurses' residences, for example, disturbances to study times due large numbers of students (Snyder, 2009:82).

4.2.12 THEME 12: NURSE EDUCATORS' RESPONSIBILITIES

The nursing students recommended a number of aspects that were organised under the theme 'Nurse educators' responsibilities'.

Supportive quotations relating to *nurse educators' responsibilities* were as follows:

"...I suggest that the teacher could have one on one talk with every student..."

"...This subject needs a student to have a mind picture not just memorise the words..."

"...Tutors with a perception and love for students and their subject..."

"...Lecturers should not give up from the students because they are trying their best..."

"...Improve the presentation of content by lecturers..."

"...To try things that will make it more interesting..."

"...Revision before examinations with the teacher..."

Literature control: It is primarily the nurse educators' responsibility to produce the nursing workforce which is desperately required by the health services. Through integration of theory and practice in accredited educational programmes nurse educators prepare and mentor nurses of different specialties for the clinical services and managerial and educational functions (Career info, [n.d.]:1). Nurse educators are the main stakeholders in the preparation of the various categories of the nursing workforce (National League for Nursing [NLN], 2002:1).

Nurse educators must design curricula, develop courses and study programmes, teach, guide and evaluate students and record the outcomes of all the processes of education. They must also advise nursing students, engage in research activities, be active participants in professional associations, present papers at nursing education conferences, and play various leadership roles in the diverse academic communities. Being involved in writing grant proposals and participating in peer reviews, keeping up to date with new developments and maintaining their clinical competency are all part of the nurse educators' innumerable responsibilities (Career info, [n.d.]:2).

Moreover, nurse educators have the responsibility of being role models for the neophyte nurses. Sowunmi ([n.d.]:[1]) refers to nurse educators as "a teacher, leader, mentor, counsellor, researcher, collaborator, scholar, motivator and clinician" because it is their responsibility to produce quality nurse professionals with appropriate cognitive, affective and psychomotor skills.

One category emerged from the 'Nurse educators' responsibilities' theme, namely, *competent nurse educators* and is discussed in Section 4.2.12.1.

4.2.12.1 Category 1: Competent nurse educators

The recommendations of the nursing students revolved around the competencies of nurse educators and were thus grouped together under

one category, namely, 'Competent nurse educators'. According to the nursing students, competent nurse educators should facilitate biological science in a more visual manner, that is, by including more laboratory experiences and making use of visual aids like videos. In this way the educators would make the subject simpler, more understandable and elicit more interest from their students.

Supportive quotations relating to *competent nurse educators* were as follows:

"...Make it live, video teach, slides, microscopy..."

"...There are audio learners who are able to learn by listening, there are visual learners who have the ability to remember viewing a picture or a video..."

"...They could be taken to the places where the bodies are being done post-mortem so that they can be able to see all the parts of the body visually..."

Literature control: In modern times competent nurse educators must hold a degree at masters or doctoral level to meet the higher education requirements. With these educational qualifications the nurse educators could work proficiently "*in colleges, universities, hospital-based schools of nursing, or technical schools or as staff development educators in health care facilities*" (Career info, [n.d.]:1).

It is essential that nurse educators are accomplished since they are responsible for facilitating the education of first year students who have completed Grade 12, and also have to prepare and accompany advanced and/or qualified nurses from the clinical areas who want to engage in continuing education opportunities at universities and colleges. They must

ensure educational experiences of high quality for the different categories of nurses that they produce (Career info, [n.d.]:1). Irrespective of the setting where a nurse educator works he or she needs to be skilled and knowledgeable in the facilitation of learning, in promoting a holistic development and socialisation of the nursing students, designing appropriate learning programmes, and evaluating the outcomes of learning (NLN, 2002:1). Sowunmi ([n.d.]:[2-7]) observes that the nurse educator competencies is a code of conduct that must guide their functioning. These competencies are set out below.

- **Content competency** – A nurse educator must be competent, knowledgeable and well qualified in the areas of her or his teaching (Sowunmi, [n.d.]:[2]).
- **Teaching competency** – Nurse educators must use a variety of teaching strategies to enhance achievement of the learning outcomes. They must engage students in guided experiential and self-directed learning (Sowunmi, [n.d.]:[3]).
- **Student development** – The nurse educators must develop students holistically so that they can function as independent practitioners (Sowunmi, [n.d.]:[4]).
- **Confidentiality** – A nurse educator must maintain confidentiality with regard to personal matters of students brought to his or her attention. They must also maintain confidentiality as regards the marks obtained by the students (Sowunmi, [n.d.]:[5]).
- **Dealing with sensitive issues** – A special skill, sensitivity and generalisation must be maintained when presenting sensitive topics that may affect some students. These could be topics like child and spouse abuse, family violence and other sensitive topics that some nursing students may have experienced or are currently experiencing (Sowunmi, [n.d.]:[6]).

- **Dual relationships with students** – This relationship should be based on educational goals and academic achievements. Nurse educators must always maintain an objective relationship with the students (Sowunmi, [n.d.]:[5-6]).
- **Valid evaluation of students** – Student evaluations should be handled competently and with care as the nurse educators play a vital role in their lives and careers. Evaluations should be “*valid, reliable, practical and objective with acceptable level of difficulty and discrimination*”. Inter-rater scoring should be established in cases of students that obtained unsatisfactory scores (Sowunmi, [n.d.]:[6]).
- **Respect for colleagues** – Harmony should always prevail in the working relations of nurse educators. They should respect each other in terms of strengths and weaknesses and work harmoniously towards the achievement of common educational goals (Sowunmi, [n.d.]:[6]).
- **Creativity** – Nurse educators need to be creative and they must instil that creativity in their students. New and fresh ideas must be brought to the educational environment by both the nurse educators and the students (Sowunmi, [n.d.]:[7]).
- **Financial integrity** – Nurse educators must handle any NEI funds honestly and with integrity according to the financial principles of the institution (Sowunmi, [n.d.]:[7]).
- **Commitment to the institution** - Nurse educators should always strive towards achieving quality teaching and learning according to the mission of their NEI (Sowunmi, [n.d.]:[7]).
- **Commitment to the profession** – As committed and competent members of the nursing profession nurse educators need to play an active role in professional organisations, scholarship and research, present papers at conferences and participate in discussions for the good name of the profession (Sowunmi, [n.d.]:[7]).

4.2.13 THEME 13: STUDENTS' RESPONSIBILITIES

Some recommendations that emerged from the nursing students were grouped under the theme 'Students' responsibilities'. The focal point of these responsibilities revolved around students dedicating themselves to their studies.

Supportive quotations relating to *students' responsibilities* were as follows:

"...Scheduling of time for studying, always study in advance so that you don't get a problem during tests and examinations..."

"...Dedicated studying' be book friendly and focus during class facilitation..."

"...as students we come together [to] study it, help one another, bring up ideas so that at the end of the day we could [can] pass..."

"...To have all the prescribed books so that to get all the information..."

"...Students must read their books and their study guide so as to get a good pass..."

Literature control: "*Student responsibility is the key to all development and learning*" (Davis & Murrell, 2003:1). Students therefore have the responsibility to be more involved and put more effort into their studies. Estes (2009:1-2) endorses this viewpoint and states that, although an educational institution and its academic staff fulfil a principal role where educational outcomes are concerned it is, however, critical for the students themselves to take control of their own learning. They should not view their learning responsibility as a burden. Despite the fact that positive learning outcomes go hand in hand with responsibility and effort the reality is that some students do not take responsibility for their

education. Estes (2009:1-2) insists that “*students need to take more responsibility for their own education*”.

Large sums of money are spent by the government and parents on education. Also, more time is spent by students in educational institutions. Therefore, they need to engage in study skills that will enhance their academic achievement. Students have a responsibility to study continuously throughout the academic year. They must not only study when tests and examinations are approaching as this can result in confusion and anxiety which may interfere with academic achievement (Mutsotso & Abenga, 2010:808).

Students have a responsibility to manage their study time appropriately through scheduling daily, weekly and monthly study assignments. Every student is responsible for identifying study methods and use information processing methods that are suitable for her or him. The information processing methods can include any or a combination of “*imagery, verbalisation, the grouping of concepts and the organization of subject matter in the learning process*” (Mutsotso & Abenga, 2010:811).

The students are accountable to ensure that the notes they take when information is shared is accurate and also that they interpret it correctly. The Cornell method of note taking could assist the students. This method involves that the student divides the paper on which notes are taken into two columns where the left column is bigger than the column on the right. They write their notes in the left column and key words and phrases pertaining to the content are written in the narrow column on the right. The notes must be dated and referenced. The key words and phrases will promote a quick understanding while the references will promote reading from the book (Mutsotso & Abenga, 2010:811).

One category emerged from the ‘Students’ responsibilities’ theme, namely, *self-study* and is discussed in Section 4.2.13.1.

4.2.13.1 Category 1: Self-study

The self-study recommendation focused on nursing students doing their own revision of biological science for their performance to improve.

Supportive quotations relating to *self-study* were as follows:

"...Study everyday a little portion then you will understand biological science..."

"...Study in conjunction with drawings, sometimes can really relieve the burden on one's shoulders..."

"...To have a group to assist him/her if he/she needs it..."

"...Group studies is [are] very important and student must have his own time alone..."

Literature control: According to Santamina (2011:1), self-study is "*the ability of the learner*" to read, "*concentrate and reflect*" on the study work at his or her own time. For self-study an environment is needed where there are no distractions. Self-study is the key for educational achievement (Santamina, 2011:1).

Bratti and Staffolani (2002:17) state, class attendance and self-study have a positive influence on academic performance. Grave (2010:17) states, the more time students spend on self-study and other study related activities the higher their academic achievement scores. Nurse educators should therefore make an effort to allocate more time for self-study during programme design (Grave, 2010:20-21).

Self-directed learning as emphasised in most academic institutions is an important skill; it is also perceived to be highly effective in any working environment and is a positive predictor of achievement (Chou & Chen, 2008:1).

4.2.14 THEME 14: PROGRAMME ORGANISATION

The nursing students in the current study made recommendations pertaining to the theme 'Programme organisation' with the purpose to reduce the workload of biological science. Some nursing students recommended that biological science be organised into semester courses.

Supportive quotations relating **to programme organisation** were as follows:

"...only cover anatomy because other subjects like General Nursing Science is there to cover for the physiology part of it..."

"... the subject must be done [made] easy by taking [emphasising] important points that are useful in nurses [nursing]..."

"...The subject to be conducted in semesters..."

"...during first semester do anatomy then physiology second semester..."

"...Must have first and second semester..."

"... can be taught up to 3rd year and divide the work..."

Literature control: Educational programmes should be reviewed regularly by all relevant stakeholders. The reviews should assess the effectiveness of the programme and suggestions for programme improvement made. Programme organisation should be based on priorities obtained from the review process and it should not be a once-off activity. Continuous planning is essential for the success of the programme. Stakeholders should engage in programme planning on a yearly basis. Priority actions for the improvement of the programme

should be documented including the responsible people (Ongoing planning for Intervention and Referral Services [I & RS], [n.d.]:115-116).

Educational programmes should be organised in such a way that they promote lifelong learning. Lifelong learning entails involvement in learning activities throughout life so as to be continuously updated with relevant and current skills, knowledge and attitudes that can be of value in personal, social and professional life (Bang, 2010:5). In order to produce graduates that are well qualified, educational programmes should be organised in such a manner that students are afforded opportunities to continue learning on their own with the guidance of educators. The programme should afford the students with formal and informal educational activities (Bang, 2010:10-11).

Two categories emerged from the theme 'Programme organisation', namely, *balance content with time* and *study guide layout* and are discussed in Sections 4.2.14.1 and 4.2.14.2.

4.2.14.1 Category 1: Balance content with time

The nursing students recommended that the time for presenting the biological science content should be balanced with the amount of content presented.

Supportive quotations relating to *balancing content with time* were as follows:

"...Decrease the work because you are overloading us some of us like me cannot cope with the lot of work..."

"...Reduce work or shorten it so that we can be able to accommodate it..."

"...the years to study BNS must be extended at least to 3rd year so that smaller portions of work can be studied..."

Literature control: Zhang (2012:1) states it is not easy to balance a full-time job with a course also on a full-time basis. The NEI nursing students felt the load of balancing the amount of clinical practice required for a nursing course and the amount of theoretical foundation required difficult. They experienced it as similar to balancing a full-time job and a full-time course. Nursing students need to balance the clinical practice with the theory that must be mastered. In fact, they need to plan properly for their personal responsibilities before commencing with the nursing programme. It is important that they involve their family members and discuss the possible changes in their personal responsibilities because it is a demanding course.

Nursing students need to prepare a weekly schedule for their studies and personal activities (Zhang, 2012:1). If one does not have this schedule she or he could become stressed by the overload of clinical and theoretical requirements of the course (Canadian Centre for Occupational Health and Safety, 2008:1).

Armstrong (2010:176) in her chapter 'Managing the quality of the educational programme' indicates the danger of facilitating new knowledge over lengthy hours where 'lengthy hours' represents six or more hours. According to Armstrong, long hours should be divided into a number of activities like facilitation, group discussions and application of knowledge gained. These different strategies will promote consolidation and internalisation of the knowledge.

Two sub-categories emerged from the category 'Balance content with time', namely, *more periods (morning periods)* and *extra remedial classes*. These two sub-categories are discussed next.

- **Sub-category 1: More periods (morning periods):** The students recommended an increase of the biological science periods and that these periods should be in the morning.

Supportive quotations relating to *more morning periods* were as follows:

"...Students should have more periods for BNS..."

"...More periods for the subject..."

"...More periods for the subject including extra classes..."

"...It must be the first period in the morning because it needs [one to have a] fresh mind..."

Literature control: According to the SANC Guide (1993:[i]), a period is "a structured 40 minute period of direct or indirect contact initiated by the tutor using any adult education method." Although this is a broad definition, it is also applicable to structured work done by the students outside the classroom situation. Therefore, according to this definition the increase in the number of periods as recommended by the students could be possible through giving the nursing students more structured biological science work outside the classroom situation.

- **Sub-category 2: Extra remedial classes:** Some nursing students recommended that remedial classes be arranged for those students who do not understand biological science.

Supportive quotations relating to *extra remedial classes* are noted below:

"..To get extra classes for the students who did not do well or who don't understand BNS..."

"...Holiday classes together with morning classes..."

"...More morning classes to be attended by the students..."

Literature control: It is a quality requirement for the NEIs to have a structured student academic support programme in place. There should therefore be evidence that constructive feedback is given to students about their academic performance. Students' remedial support should also be evidenced (SANC Self-assessment Tool, 2005:[8]). Armstrong (2010:177) in her chapter 'Managing the quality of the educational programme' states, the planned support programme is essential for assisting students who have difficulty in understanding the subject matter.

4.2.14.2 Category 2: Study guide layout

An improvement in the layout of the biological science study guide was recommended by some of the nursing students.

Supportive quotations relating to *study guide layout* were as follows:

"...Study guide must be upgraded in a better way..."

"...Study guide to be reviewed..."

"...Improve the lay-out of the study guide..."

Literature control: A study guide outlines the learning programme for a particular subject. As stipulated in the SANC Self-assessment Tool (2005:[2]) a learning programme should be evaluated regularly to meet the changing educational needs. Even when students are in the clinical areas the learning outcomes should be aligned to the learning opportunities. The facilitation methods should also be indicated in a study guide. In addition, these facilitation methods should be appropriate to the learning outcomes.

The students as an important stakeholder should be involved in the review of study programmes and this includes study guides. These reviews of

study guides are for correcting design deficiencies and thereby improving the study material (Tuning, [n.d.]:5).

4.2.15 THEME 15: ASSESSMENT METHODS

A number of recommendations related to assessment methods were made by the nursing students.

Supportive quotations relating to *assessment methods* were as follows:

"...Can't we write two papers in our first year, paper 1 consisting of anatomy, paper 2 consisting of chemistry..."

"...I think what they are doing this year that BNS will have 1st and 2nd paper it is good and they must not change it because I am sure it will bring good results..."

"...No hidden questions, clear areas that are expected to be asked during exams..."

"...Also in time of exams biological science must be the first subject to be written it needs time for studying..."

Literature control: Assessment methods are categorised into formative and summative assessments. Formative assessments are done to give feedback about learning while summative assessments indicate student's competency in a course (O'Farrel, [n.d.]:5). Strategies should be used to assist students to succeed and be less anxious when writing tests and examinations. These strategies can, for example, involve giving students examples of questions that may be asked in tests and examinations. Students should be taught how to manage time and use their reasoning skills to analyse questions and answer multiple choice questions during tests and examinations (Mutsotso & Abenga, 2010:811).

Two categories emerged from the theme 'Assessment methods', namely, *more formative assessment opportunities* and *reasonable examination questions* and are discussed in Sections 4.2.15.1 to 4.2.15.2.

4.2.15.1 Category 1: More formative assessment opportunities

Some nursing students recommended that they be given more formative assessment opportunities as a way of improving their biological science performance.

Supportive quotations relating to *more formative assessment opportunities* were as follows:

"...There should be more application tests or assignments to boost our DPs [year marks]."

"...To write a test the next day about the previous day's work..."

"...I would suggest to [we] have questions after every system so that we can be alert of what to expect during examinations..."

"...Students must get used to diagrams and drawings not only in the examinations but also during the course of the writing tests..."

Literature control: The SANC indicates that learner assessments should be done continuously through the use of a variety of assessment methods. According to the SANC, the assessments must be valid, current, authentic and sufficient (Nursing Act, 2011:11-12).

Curriculum designs should maximise formative assessment feedback. Formative assessments should be done to give feedback about learning. The feedback should be about the maintenance or the improvement of the

student's progress. Formative assessment feedback has benefits like promotion of motivation towards improved learning, correction of mistakes, identification of strong and weak points, and the provision of performance improvement opportunities (O'Farrel, [n.d.]:5-6).

4.2.15.2 Category 2: Reasonable examination questions

A number of recommendations were made by the nursing students that related to the category 'Reasonable examination questions'.

Supportive quotations relating to *reasonable examination questions* were as follows:

"...The examination questions to be set following the study guide..."

"...Evaluate as per assessment criteria in study guide..."

"...The questions should be in line with the content of the study guide..."

"...During examinations the questions or marks like ten must not be awarded to a question, increasing the failure rate because if you did not attempt it you are likely to fail..."

Literature control: Written examinations are a universal tool used to assess the student's performance in a subject. According to Jones, Harland, Reid and Barlett (2009:1), the aims of an examination or an assessment are to:

- make judgements about the level of conceptual development of a student
- make judgements about the effectiveness of the teachers and the students
- determine what and how teaching is facilitated
- determine what and how the students learn.

Assessments are therefore an integral part of teaching and learning. It should always be ensured that all the learning outcomes of a subject are assessed. Different types of assessments like formal examinations, clinical assessments, projects, problem solving activities, and oral presentations can be used to assess different learning outcomes (Jones, Harland, Reid & Barlett, 2009:1).

The learning outcomes, which are statements of learning achievement, should be formulated according to Bloom's taxonomy (Jones et al., 2009:2). Bloom's taxonomy prescribes that learning outcomes are formulated from the lowest to the highest level according to the student's level of development. Suitable verbs are used for each of the six levels of the taxonomy. The six levels are then further integrated into three levels known as lower, intermediate and higher order outcomes. Suitable verbs are used for each of the levels of the taxonomy. At the lower level students may be expected to mainly name, list and define aspects while at the higher order they may be expected to evaluate or justify aspects based on certain criteria. Lower level students like first year students are given more of the lower order questions and less of the higher order questions (Jones et al., 2009:2).

The tests and examination specification table template of the NEI in the EC specify that first year students must achieve 20% in the lower order, 40% in the intermediate and 40% in the higher order questions. For the second year students the percentages are 15% in the lower order questions, 35% in the intermediate and 50% in the higher order questions. Reasonable examination questions should therefore assess all the outcomes of a subject through maintaining a balance between lower order, intermediate and higher order questions (NEI Test/Examination Specification Table, [n.d.]:[2]).

To ensure that quality examination papers are set, at the EC NEI educators from all the five campuses of the NEI with at least two years'

experience in teaching a particular subject set these papers. The pool of examination papers is submitted by the relevant subject heads to the relevant programme managers. The programme managers as internal moderators compile a main and a re-examination paper from the submitted pool of questions. The examination papers are typed by the examination office typists. They are then submitted by the academic registrar to the relevant university moderators for further quality assurance. All these steps are taken to ensure that quality examination papers are written at the NEI (NEI Examination Policy, 2011:4).

According to the SANC Self-assessment Tool (2005:[20]), students should be afforded the opportunity to appeal for the assessments according to a predetermined appeals procedure. Appeals should be conducted for both formative and summative assessments.

4.2 CONCLUSION

This chapter provided us with the themes, categories and sub-categories that emerged from the analysis of the data obtained from the completed appreciative interview schedules. The themes, categories and sub-categories were aligned to Appreciative Inquiry as the framework of this study. They were also aligned to existing relevant literature. The challenges that were mentioned by the students under the question of challenges were reframed by the students into wishes, vision and recommendations. Therefore all the challenges of biological science were covered under these relevant objectives.

Chapter 5 will focus on recommendations that could improve the academic performance of biological science at the NEI in the EC province. It would also cover the limitations that were encountered by the researcher during the course of the study.

5 CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

5.1 INTRODUCTION

Chapter 4 presented the research findings and literature control for this study. The findings were aligned to Appreciative Inquiry as the framework of this study. Chapter 5 captured the aims, objectives, research question and significance of this study. This chapter 5 also focused on summarising the findings within the context of AI. Recommendations, limitations, conclusion and suggestions for future research were also covered in this chapter.

5.2 AIMS, OBJECTIVES, RESEARCH QUESTION AND SIGNIFICANCE

The overall aim of this study was through the use of the Appreciative Inquiry process, explore and describe the factors influencing the academic performance of students in the subject biological science at a specific NEI in the EC Province. This aim was further broken down into two objectives for the study. These objectives were:

- Explore and describe the factors influencing academic performance of students in the subject biological Science.
- Make recommendations to the nursing education institution and the Department of Health, based on the finding of the study.

The research question to be answered was:

How could the Appreciative Inquiry process be used to explore the factors influencing the academic performance of students in the subject biological science?

Therefore through the use of the AI process the factors which influence the academic performance of students in the subject biological science were explored and described by the second year nursing students of the NEI in the EC Province. The factors identified by the students were analysed by the researcher. Recommendations would then be made in this chapter as to how these factors could be used to bring about improvement in the academic performance of students in the subject biological science at the specific NEI in the EC province and other NEIs.

These would be recommendations that would significantly benefit the nursing students, the NEI, ECDoH and the entire public. The nursing students would benefit from the prompt completion of the comprehensive four year nursing programme within the four years. Therefore the pass rate of the NEI would be improved. The ECDoH would benefit from getting qualified nurses within the four year period. The prompt completion would save the ECDoH from paying the student's stipend for more years. The payment of the stipend only within the planned four years would save the tax payers money. The public would also benefit through the curbed shortage of nurses as the nurses would qualify within the prescribed four years.

5.3 SUMMARY OF THE FACTORS THAT INFLUENCE ACADEMIC PERFORMANCE IN BIOLOGICAL SCIENCE

This overview covered all the findings for each question of the appreciative interview schedule. Recommendations would also be discussed. These would be aligned to the 4-D cycle as the framework of this study.

5.3.1 Discovering the best of “what is”

The nursing students responded to a question aligned to the first D of the AI 4-D cycle. Their positive stories indicated that there were a number of excellences about biological science at the NEI. That is there was a lot that was “working well” for biological science. If these excellences could be maximized they could lead to great excellent positive changes towards the biological science academic performance at the NEI. The findings about the student’s strengths and passion about biological science are summarised below.

5.3.1.1 Summary of the strengths and passion about biological science

The nursing students were passionate about the biological science content, nurse educator characteristics, study strategies, resources and biological science assessments. These aspects were therefore influencing their biological science performance positively. That is they increased the potential for the students to succeed in biological science. Therefore they improved the academic performance in the subject biological science.

⇒ Biological science content:

Learning about biological science was very interesting to the students as it increased their knowledge and improved their nursing skills. Biological science was the foundation of the knowledge of the normal structure and function of the human body for the students. The students felt that in biological science they were just learning about the structure and functioning of their own bodies. This therefore increased their curiosity

and interest towards biological science. Happiness about this subject was displayed by joking about its terminology. The knowledge of this subject also enhanced the understanding of other nursing subjects like general nursing science and pharmacology. General nursing science deals with the abnormalities of the body systems, that is diseases and pharmacology deals with the various treatments of these diseases. Therefore biological science knowledge supported the principle of learning of moving from the normal to the abnormal.

The knowledge of the structure and function of the body as enhanced by biological science content also improved the practical skills of the nursing students. The students were able to accurately describe body parts during history taking like when they are admitting patients. Accurate history taking is vital for the accurate diagnosis of patients. Biological science knowledge also promoted accurate location of injection sites to prevent nerve damage. Also nursing patients with conditions of the various structures of the body learnt in biological sciences enhanced the knowledge of the subject and promoted patient safety.

Linking biological science content with previous knowledge like life science from school and first year biological science for second year students promoted understanding of the subject. The teaching and learning principle of moving from the known to the unknown was therefore supported by the students. Those students that enjoyed life science at school also enjoyed biological science as they saw it as a continuation of what they did at school. Students who did life science from grade ten to grade twelve were highly confident of passing biological science at the NEI.

⇒ **Nurse educator characteristics:**

Nurse educators as indicated by the students had certain good qualities and facilitation strategies. These qualities and facilitation strategies promoted student's understanding of biological science. They therefore

contributed to the success of the students in biological science. These were dedicated and committed educators who worked extra hours without any additional remuneration in order to assist the students. Extra hours were worked even during weekends and public holidays by some educators. The educators were also knowledgeable and passionate about biological science. They therefore enjoyed facilitating it. The passion of the educators about biological science when transferred to the students could lead to an improved biological science performance. Educators were also supportive and caring for the students. This support and caring promoted a good educator learner relationship where students were even capable of sharing their personal problems that could hinder learning with their educators.

Facilitation strategies used by the educators that promoted active involvement of the students in learning biological science were enjoyed by the students. These were facilitation strategies like group work and class presentations. Educators also facilitated biological science by engaging students in drawing biological science structures. The students enjoyed the activity of these strategies and the humour of laughing at one another's funny drawings. The jokes about these drawings promoted understanding and remembering the biological science content. Therefore the principle of active involvement that promotes learning was supported by the students. Facilitation strategies that promoted active involvement of the students were valued by the students and could therefore lead to success in biological science.

⇒ **Study strategies and resources:**

The students valued study strategies that promoted active involvement as they enhanced understanding of biological science. These rewarding study strategies involved hard work, use of drawings, joking about subject terminology and group studies. These strategies entailed individualised studying and support from fellow students. Dedicated individualised study and team work through group studies promoted understanding and

success in biological science. The use of study resources like prescribed books and study guides during studying also promoted understanding.

⇒ **Biological science assessments:**

Various formative assessment strategies used by the nurse educators promoted success in biological science. These formative assessments were application test, quiz test and assignments. The application test was a first year biological science oral test. In this application test the students had to respond orally to a set of written questions which required identification of bone structures. This test was loved by the students as they scored high marks that boosted their year marks.

The quiz test was mainly mentioned by campus E students. This was a test written by the students on completion of each biological science chapter. There were some campus A students who made mention of writing a test after each chapter too. The students were passionate about this quiz test as it promoted thorough revision of each chapter before moving to the next one. Therefore it improved their performance in biological science.

Assignments were a formative assessment strategy that was mentioned by campus A students. The students loved the assignments as they promoted understanding of biological science and also boosted the year marks. All these formative assessments through improving understanding and year marks influenced biological science performance positively.

There were students who felt good about summative assessments. These were students who were passionate about passing first year biological science. For these students passing first year biological science promoted love of the subject. These students were positive that they will also pass second year biological science summative assessments. This positivity would have a positive impact on biological science performance.

5.3.1.2 Recommendations

The most satisfying aspects of biological science as identified by the students should be carried forward for influencing the academic performance of biological science positively. This would be in line with the Appreciative Inquiry assumption which states that *“people have more confidence and comfort to journey the future when they carry forward positive parts of the past”*. That is *“if we carry parts of the past forward it should be **what is best** about the past”* (Reed, 2007: 28).

- *Accompaniment of students by biological science educators to make the interesting content more interesting and understandable:*

The biological science educators should accompany their students to the various clinical areas to enhance understanding of biological science during actual patient care. The students indicated that use of biological science knowledge during clinical care promote understanding of the subject. Therefore educators should assist those students who are unable to apply biological science in patient care on their own. As the student would be nursing patients with different diagnoses the movement from normal to abnormal would be enhanced during accompaniment of students. The student would be assisted to state the area affected by the diagnosis and its functions. This would promote understanding of the clinical manifestations of the patient and nursing care. In this way the students would really see that biological science is the foundation of nursing.

During the accompaniment process students could also be given biological science assignments related to the patients they are nursing. Students could also be given case studies where they would start by describing the affected structures and their functions and then go on to study about the entire patient that she or he is nursing. These accompaniment activities like correlation through assignments and case studies would increase the student's interest in biological science and its academic performance would

improve. Also the use of these patient related assignments and case studies would promote understanding of scenarios during formative and summative assessments. As this correlation would continue to other subjects like general nursing science and pharmacology there would be overall improvement of academic performance even in these subjects.

- *Use of reflection as a facilitation and learning strategy:*

During the data collection process the students were encouraged to reflect about biological science. Reflection and its advantages was discussed in chapter 3, section 3.3.3.7. This reflection could be used as a facilitation and a learning strategy for biological science and even other subjects. That is after each clinical allocation, when the students are on block they should be encouraged to reflect about the patients they have nursed in the units. For biological science this reflection should focus on the biological science curriculum. It would start from the diagnoses of the patients they have nursed, the description of the area affected by the diagnosis and functions of that area. This reflection could go on to the nursing care rendered and treatments that were given to the patients. As this reflection is integrating other subjects like general nursing science and pharmacology, the educators of these subjects should form part of these reflection sessions. That is a team and integrated approach to the reflection sessions should be adopted.

This reflection as stated in section 3.3.3.7 would promote a positive inner dialogue, deep and lifelong learning. Reflection could also promote personal and professional growth of the students. It could remove doubts and promote clarity about biological science and the other subjects thereby improving performance.

- *Integration of biological science with other subjects during facilitation:*

As the students indicated that correlation of biological science with other subjects like general nursing science and pharmacology promotes a better understanding this could be strengthened by correlation of the subjects during facilitation. If for example a biological science educator was teaching the urinary system this could be followed by a general nursing science educator teaching conditions of the urinary system. In this way the students would further see biological science as part of other nursing subjects. That is the whole of all the subjects that make up a nurse should be presented in an integrated manner. This “*wholeness*” as seen in the principles of Appreciative Inquiry would bring up the best performance in biological science. Proper planning would be essential for this “*wholeness*” to succeed (Preskill & Catsambas, 2006: 10).

- *NEIs should admit students that have a strong background of life science.*

Knowledge of life science (biology) enhances understanding of biological science and better performance as stated in the student’s positive stories. That is students that have high life science symbols like D and above. Students with higher life science symbols should therefore be admitted in the four year comprehensive nursing programme.

- *Appointment of dedicated, supportive and passionate educators.*

NEIs should strive towards appointing educators who possess the above mentioned characteristics. These characteristics should be natured through staff development for the educators that are already in the system. These dedicated, supportive and passionate educators should continue supporting the students as the supportive educational environment enhances learning. Educators should be cautious though not to make the extra classes during weekends and public holidays compulsory for all the students as this creates unhappiness for those students who feel they understand biological science. It is therefore

important that they “*value the differences*” of their students as they support them as seen in the assumptions of Appreciative Inquiry (Reed, 2007: 28).

The educators that demonstrate passion when facilitating biological science could also be video- taped so that compact discs (CDs) of biological science facilitation are kept at the NEI. These CDs could be used by the students of the various campuses of the NEI. This would facilitate exposure of the various campus students to the facilitation strategies of the different campus educators. The CDs could also assist in the shortage of educators in that when there is no educator in class the students could watch the biological science CDs. These CDs could also assist the students who did not understand in class to view them at their own spare time. Students could also watch these CDs during their group study sessions. Group discussions would then follow the CD watching session. This would therefore promote E- learning opportunities at the NEI.

- *Regular biological science formative assessments:*

It would appear that in some campuses like campus E and A there are other formative assessments that are written by the students to promote understanding of biological science. These are the quiz test and assignments respectively. These frequent formative assessments as indicated by the students improve the academic performance of biological science by encouraging the students to study the chapter thoroughly before moving to the next chapter. It could be wise if the other campuses would also give their students these formative assessments to promote the understanding of biological science. That is the campuses should have similar helpful formative assessment strategies. There should also be a variety of formative assessment strategies like tests and assignments. Drawings should also be included in formative assessments as they are part of summative assessments. For clarity purposes these drawings should be in colour as it was indicated by the students that black and

white drawings are confusing. This confusion is related to the fact that drawings are in colour in the prescribed book.

5.3.2 Dreaming “what could be”

As the students were asked about their wishes about biological science, a number of wishes came up as the student’s dreams about biological science. Realization of these wishes could improve biological science performance.

5.3.2.1 Summary of the student’s wishes

The wishes of the students that could bring about improvements towards biological science performance revolved around provision of educational resources and increased passed rate.

⇒ **Educational resources:**

The different dreams of the students were about educational resources that could promote practical application opportunities for biological science. Biological science could be understood better if there were simulation opportunities in a simulation laboratory with models. In this laboratory the students could visualise and touch the structures they are learning about. Other visual aids like videos and poster would promote multi sense learning and therefore a better understanding of biological science. Learning resources like computer laboratories would give the students an opportunity to research and study more about biological science. A well- equipped library would also promote own research and reading about biological science. The student’s dreams were more for a practical approach than a mostly theoretical approach for biological science facilitation and learning. This was a wish for a more hands on approach with appropriate learning resources.

The use of one understandable prescribed book was also wished for by the students. Some indicated that the book by Ross and Wilson was understandable and clear in presenting biological science content.

⇒ **Increased pass rate for biological science:**

Passing biological science was viewed as the most satisfying aspect for the students. Their dream was that if the pass rate could be 100% the students would be more satisfied. Putting more effort on studying biological science was viewed as another aspect that could lead to a 100% biological science pass rate.

The student's dreams could result in the construction of a better future for biological science as seen in the constructionist principle of Appreciative Inquiry (Reed, 2007: 26). This better future was the increased pass rate that was also wished for by the students.

5.3.2.2 Recommendations

One of the discovered positives of biological science was that its content is interesting. It was seen that a practical application of the interesting content in the actual care of patients in the clinical situation makes biological science more understandable. Therefore providing more practical facilitation and learning opportunities could make the interesting content more interesting.

- *Provision of educational resources:*

The NEI should strive towards providing the educational resources as identified in the student's dreams. These are resources like simulation and computer laboratories, models and charts. Young people love technology, therefore a more hands on approach through interaction with various technological educational aids would increase the love of the already loved

biological science content. The NEI budget should therefore be directed towards the provision of educational resources as identified in the student's dreams about biological science. The ECDoH should assist the NEI by providing it with more funds for the educational resources. Furthermore proper utilisation and maintenance of the educational resources would be essential so as to keep them in good working order.

The NEI should also consider prescribing one book for biological science as wished by the students. A simple prescribed book that could provide the basic understanding of biological science could be prescribed. Having to study one prescribed book would reduce the workload for the students and influence the biological science performance positively. Therefore provision of these resources and the simple prescribed book could lead to the realisation of the dream of increased pass rate.

5.3.3 Designing "what ought to be"

The students constructed their vision of biological science. This was based on the identified strengths and dreams about biological science. This was a design of a better biological science as indicated in 5.3.3.1 below.

5.3.3.1 Summary of the student's vision

A better biological science performance which is the increased pass rate could be realised through:

- ⇒ Provision of resources that would make biological science more enjoyable
- ⇒ Restructuring biological science so as to reduce its workload
- ⇒ Change of attitudes towards biological science
- ⇒ Improved biological science assessment strategies

5.3.3.2 Recommendations

A practical approach in realising the vision created by the students should be adopted. Some aspects of Appreciative Inquiry as the framework of this study could be used as follows in the realisation of the student's vision:

- *Use of the design phase of Appreciative Inquiry in creating a biological science vision, mission and core values:*

The design phase of Appreciative Inquiry should be used in biological science and even other subjects that are done by the students. This could assist the students in designing their own biological science vision, mission and core values. These would be the values that would be adhered to in order to realise the created vision. This design should be done at the beginning of the year before the commencement of tuition. Then during the course of the year the stakeholders who would be the nursing students and educators would frequently evaluate if they are performing according to the core values of realising their vision. The frequency of evaluation would be for example at the end of each block period. The evaluation should always be appreciative in nature. This would promote introspection on the part of the stakeholders and timeous adjustment of activities where necessary.

5.3.4 Delivering “what will be”

From the question about the recommendations for biological science the students created the destiny of biological science. This destiny was the future directed biological science implementation process aimed at improving its academic performance. Through this destiny biological science was made a subject where there will be continuous learning of all the stakeholders. These stakeholders as identified by the students were the NEI management, nurse educators and the students. The findings of this destiny of biological science are summarised below.

5.3.4.1 Summary of the student's recommendations

The responsibilities of the various stakeholders which are management, nurse educators and students were identified. These were various implementation responsibilities which would lead to improved performance in biological science. Also some restructuring of biological science was recommended.

⇒ NEI management responsibilities:

The NEI management should provide human and material resources that would contribute to improvement of the academic performance of biological science. Provision of human resources in the form of nurse educators would improve the student educator ratio for the NEI. Material resources which would promote practical facilitation of biological science should also be provided by the NEI management. Management should also provide infrastructure like classrooms and nurse's residences so that the students are able to study together after hours. It could also be wise for the management to revise the admission criteria as some students recommended admission of young students that have a strong life science background into the four year comprehensive course.

⇒ Nurse educator responsibilities:

Nurse educators should be competent and experienced in facilitating biological science. These attributes of competency and experience could be seen in the nurse educator's use of a variety of facilitation strategies and use of a practical facilitation approach for biological science. Educators with these attributes and facilitation approaches would contribute positively to the academic performance of biological science.

⇒ **Student responsibilities:**

The students must play an active role in their biological science studies for their performance to improve. Their active involvement can be achieved through self- study. They should have an inquisitive attitude which is demonstrated through conducting own research and reading in biological science. Students should conduct their own disciplined revision according to the study guide. The study discipline could be achieved by drawing own study time table which would promote daily revision. It could be crucial that they also use the drawings during their revision. Individual study should also be combined with group study at times so as to be able to share information with other students. Group studies could promote successful academic performance for all the students as they assist each other towards understanding biological science.

⇒ **Biological science programme organisation:**

The workload of biological science was seen as having an adverse effect on its academic performance. Therefore some restructuring of biological science as indicated by the students could have a positive impact on its outcomes. The variety of restructuring strategies as recommended by the students revolved around balancing biological science content with time. These strategies included making the subject a semester course or increasing its years of study. When the subject is a semester course a portion of the content could be written in June and the rest at the end of the academic year. When the years of study are increased the content could be spread up to third or fourth year. Another restructuring strategy for biological science could be an increase of its periods so as to be able to cover the content. Remedial opportunities afforded for those students who do not understand the subject could also impact positively on biological science performance. Restructuring of the lay-out of the biological science study guide could also promote effective studying and thus improvement of performance.

⇒ **Biological science assessments:**

A change in both formative and summative biological science assessment could also be a solution towards the improvement of its academic performance. More regular formative assessments in the form of assignments and tests could promote a culture of regular studying which could lead to improved academic performance. The students should be given a variety of formative assessments so as to improve their year marks. An improved year mark would impact positively on the entire performance of biological science. The formative assessments should also take the format of the summative assessments. This would familiarise the students with the manner in which assessments are structured. It would also reduce stress during the summative assessments. Setting of both formative and summative assessments should be in-line with the study guide and learning outcomes. In this way the tests and examination papers would be reasonable. The students would perform well when the papers are reasonable and performance would improve.

The examination paper's workload could be reduced by dividing the biological science content into two papers even in first year. Assisting the students towards preparation for the examinations could also improve the academic performance of biological science. For example giving the students examples of examination questions and also giving them adequate time to prepare for their examinations would have a positive impact on the performance of biological science.

5.3.4.2 Recommendations

- *Appreciative evaluation sessions of biological science:*

The destiny of the subject biological science should be based on the involvement of all the stakeholders as identified by the students. These stakeholders would be the NEI management, the nurse educators and the

students. The universities of affiliation and ECDoH should also be involved as important stakeholders. There should be appreciative evaluation sessions of biological science using the SOAR approach. This approach would result in identifying the strengths, opportunities, aspirations and also achievement of the desired results for the subject biological science (Silbert & Silbert, 2007: 2).

During the evaluation sessions the stakeholders should adopt a “learner mindset” in which they focus on positives, solutions and team work. The “learner mindset model” of evaluation would promote flexibility, strategic thinking and possibilities for expansion (Adams et al, 2004: 111). They should therefore ask significantly positively framed questions. The positively framed questions could bring about information about the factors that are contributing to the success and effectiveness of biological science as they were identified by the students earlier on. The positively framed question could also bring about information as to what needs to be changed and how could it be changed. That is what could be done better and differently to improve the academic performance of the subject biological science (Center for creative leadership, 2011: 1; de Tufo, 2002: 1).

The evaluation could provide assistance for strengthening biological science. It would promote a culture of reflection and learning about biological science. The data from the evaluation could also influence the funders who are the ECDoH in making decisions about funding for biological science improvement strategies (Saunders, 2006: [9]); Shutzer & Tyner, 2009: 1).

- *Provision of appropriate infrastructure:*

In line with the recommendations of the students and based on evaluation made by the various stakeholders of the NEI the identified projects and activities should be implemented towards improving the academic performance of biological science. These would include provision

of appropriate infrastructure which would promote adequate facilitation and studying of biological science. The NEI management would play a major role in the provision of this infrastructure. In-service education should be conducted on the use and maintenance of the provided educational infrastructure so as to promote its optimum and effective utilisation.

- *Biological science facilitation and study strategies:*

Also as the students have recommended the use of effective and interesting facilitation strategies, workshops should be conducted on facilitation of biological science and its facilitation strategies. Students should also be orientated on the importance of self and group studies as they were recommended by the students. Students should also be assisted towards the formation of effective study groups. These study groups would promote an interactive, fun and challenging manner of studying biological science. The ECDoH through the research and epidemiology section could assist the NEI towards legally obtaining permission to expose the biological science students to cadaveric exposures. Biological science facilitation could also be benchmarked from one of the universities of affiliation which has a medical school. The benchmarking could also be done from the other two universities of affiliation.

- *Evaluation of biological science structure including study guides:*

Students should be orientated on how to use the study guide as some students indicated that the study guides are useful and others felt that they must be improved. As the study guides are reviewed yearly the inputs of the students should be considered during those reviews. The students should be given an opportunity to evaluate the usefulness of the study guides. The results of the student's evaluation should be incorporated during the study guide review sessions. Also students and all the relevant stakeholders should be given an opportunity to evaluate the

entire biological science structure including the prescribed books used. This would give the stakeholders an opportunity to identify strengths and areas of improvement. The students for example came up with a number of biological science workload reduction suggestions like increasing periods, semester course and increasing years of study. An evaluation of the feasibility of these workload reduction strategies should be done so that the best ones can be implemented.

- *Evaluation of biological science assessments:*

A number of assessment related recommendations came from the students. Therefore an evaluation of the biological science assessment practices should be done by its stakeholders. This evaluation session could be done in the form of a workshop. The workshop should cover aspects like phrasing of questions, constructing scenarios, setting assignments, calculation of specification tables, compiling a marking guide and marking of test and examinations. Newly appointed nurse educators should be inducted on these aspects. All this would be done to ensure that biological science assessments are fair for the students. Fair assessments would lead to positive biological science performance.

- *Scope for examination:*

The students also recommended that they be given scope for examinations. There is always a controversy at the NEI about giving scope for examinations but students should be given broad areas where examination questions would be set. Also areas that are not important for examination purposes should be indicated so that students do not waste time studying unimportant areas. This would reduce the workload for the students. It is also essential that formative assessments take the same format as the summative assessments in terms of specification table, scenarios, drawings and even the lay-out. This similar format would reduce the stress during summative assessments and could contribute to improved performance.

- *Monitoring of assessment practices:*

The responsible managers should monitor adherence to agreed assessment practices across the NEI campuses. The emphasis during this monitoring should be on the formative assessment practices of the various campuses of the NEI. This monitoring is essential to ensure that there are similar assessment practices in all the campuses. The managers should also ensure that assessments are according to the course outcomes and study guides.

5.3.5 The question of challenges

A question about the challenges for the subject biological science was also posed to the students.

5.3.5.1 Summary of the student's challenges

The content of the findings from the question of challenges for the subject biological science was the same as what emerged from the questions about the positives, wishes, vision and recommendations. The only difference was that the challenges were negatively framed and the positives, wishes, vision and recommendations were positively framed.

5.3.5.2 Recommendations

Challenges should not be used as the focus of an inquiry because that can lead to people losing energy and engagement. These challenges and problems should not be dismissed or ignored but appreciative questions about them should be asked as seen in the appreciative questions that were asked during this study (Preskill & Catsambas, 2006: 26). Therefore the act of asking positive questions about the subject biological science and other aspects of the NEI should be learned. Sessions could be held for

the various NEI stakeholders for the purpose of learning the skill of constructing energising appreciative questions (Adams et al. 2004: 118). These energising appreciative questions would bring about positive change for the biological science performance and for the entire NEI.

5.4 LIMITATIONS

Limitations are the challenges that are faced by the researcher during the process of the study. They could result to some biases in the study results. If the study results are biased due to study limitations, that could affect the transferability of the study results (Burns & Grove, 2009: 707).

5.4.1 Types of limitations

Limitations could either be theoretical or methodological. Theoretical limitations could be the challenges of the framework, conceptual and operational definitions (Burns & Grove, 2009: 41).

Methodological limitations could be those that are related to the study design (Burns & Grove, 2009: 41). They could arise from the research design, sample, data collection and data analysis. Any limitation that occurred during the study must be considered during the interpretation of the findings of the study. It must therefore be reported (Polit & Beck, 2008: 74).

5.4.2 Possible alternative methods for the study

The topic of this study which was about factors influencing the academic performance in biological sciences of students in a NEI could have been studied quantitatively. That is reducing the biological science performance into cause and effect relationship. A hypothesis could be formulated as "the quality of grade twelve certificates affects the performance in the

subject biological science". Or an experiment could have been conducted concerning "the effects of facilitation methods on the academic performance of biological science" (Polit & Beck, 2008: 250).

The cause effect relationship would enhance validity by controlling confounding variables (Polit & Beck, 2008: 16). The quantitative designs would yield evidence of high quality which is not biased by personal experiences (Polit & Beck, 2008: 263).

Probability sampling methods would be used with these quantitative approaches. These probability samples would be large and representative. They would also promote the estimation of the sampling error (Polit & Beck, 2008: 348).

Quantitative designs would warrant the use of structured data collection methods. That is data collection methods that have fixed questions that warrant fixed predetermined responses (Polit & Beck, 2008: 414). As an example, fixed closed ended questions would facilitate ease of administration and analysis. The respondents would complete them in a short time by for example simple ticking the appropriate answer. Close ended questions would also be answered well even by respondents who cannot clearly express themselves verbally (Polit & Beck, 2008: 415).

Despite these strong points of these quantitative designs, they could not be utilised for this study as they are too reductionist and artificial for this study (Polit & Beck, 2008: 264). Even single qualitative designs like phenomenology, grounded theory, ethnography and historical research could not be used because they would be too limiting for this study (Polit & Beck, 2008: 22).

5.4.3 Limitations of the appropriate study design

The qualitative, contextual, exploratory and descriptive design that was used for this study had some limitations as there is no method that is completely appropriate for a study (Hofstee, 2006: 118). There were some few methodological limitations that were experienced with regards to the sample and data analysis. These limitations did not have any adverse effects on the study results though.

The non-probability consecutive sample of second year students ended up being too large (429 completed appreciative interview schedules) as the students were enthusiastic to participate in the study after the presentation of Appreciative Inquiry. The large sample was good for the representativeness of the results but the limitation was that it was too time consuming to analyse the schedules as the analysis involved reading all the narrative data. Reading, arranging and categorising the emerging themes was time consuming (Polit & Beck, 2008: 220). The researcher therefore allocated more time for this reading. The lesson for other qualitative researchers is to try and minimise the sample size for qualitative studies (Polit & Beck, 2008: 344).

The researcher planned to do a power point presentation of Appreciative Inquiry in all the campuses but in some campuses the plugs were not working. Therefore a flip chart was used in those cases. The lesson is that one must always have a plan B to cater for contextual issues. Also the researcher had planned to collect data from the small to the biggest campus in terms of student numbers. That did not happen as the data collection was guided by the availability of the students at the campuses.

Despite the availability of predetermined questions for the semi structured interviews, there were no fixed answers provided. The respondents therefore gave different responses worded differently. The researcher had to be alert of possible distortion of meaning from those respondents who were not fluent to express themselves in English.

As the research was conducted in the naturalistic setting of the campuses and it was almost examination time some students were busy writing remedial tests and some were finishing up their skills. The researcher had to wait for these students and therefore more time was spent at some campuses. Therefore researchers conducting studies at the NEIs should try collecting data away from examination periods.

5.5 FINAL RECOMMENDATIONS

The qualitative, contextual, exploratory and descriptive design of this study came up with a number of factors influencing the academic performance in biological science of students in the NEI in the EC province. Amongst these factors there were those that were currently influencing the biological science performance positively. The current positives included the interesting biological science content especially when applied to patient care settings. They also included some characteristics of the nurse educators who facilitated biological science actively and also promoted active participation of students. Study strategies that involved group activity, biological science assessments that promoted hard work and actually passing biological science assessments were also positive contributors to the academic performance of the subject biological science.

Again students also wished for and recommended availability of a variety of educational resources that could promote activity for biological science. Activity was also recommended in the form of execution of responsibilities by various stakeholders like management, educators and students. Activity should also be in the form of programme organisation with the aim of reducing biological science workload. Activity should also be in the form of attitude change towards biological science.

The final recommendation therefore based on these identified factors is that biological science needs activity, activity and activity for its performance to be influenced positively. This would be activity during

facilitation, activity during studying, activity in applying biological science knowledge in patient care and activity of the various stakeholders in carrying out their responsibilities. Activity is the key for learning for the new generation as they love hands on in technology. Even other NEIs who still do not have adequate resources should strive towards promoting activity in the facilitation and studying of biological science for its performance to be positive.

Although research has been done in some areas about the effects of age and life science background in biological science performance, it is recommended that these aspects be researched at the NEI in the EC province. From this qualitative study more quantitative studies could be conducted. During this study the students alluded to the positive contribution of life science background to the academic performance of biological science. A more quantitative study measuring the effects of life science background on the academic performance in biological science could be conducted. Also as the student population of the NEI is made up of young and mature students, a quantitative study could be conducted on the influence of age on the academic performance of biological science.

There were also mixed contributions from the students about the contribution of the study guides on biological science academic performance. Some students indicated a positive contribution of the study guides whilst others indicated that they need to be reviewed. Therefore a quantitative study about the effects of the study guides on biological science academic performance could be conducted. It is therefore clear that more research is required towards the subject biological science as it is the foundation of all health sciences.

5.6 A REFLECTIVE CLOSURE

Chapter 1 of this study gave the introduction, rationale and background to the topic of this study which is about the factors influencing the academic performance in biological science of students in a NEI in the EC province.

The problem statement, research questions, objectives of this study and its conceptual framework were outlined. A description of the setting of this study which is a NEI in the EC province was also outlined in order to give the readers a mental image of the setting. Also in chapter 1 the readers were introduced to the definition of terms, research method, trustworthiness and ethical considerations of this study. The readers were also introduced to the issue of limitations.

Chapter 2 presented Appreciative Inquiry as the framework of this study. In chapter 3 the research design and methods for this study were outlined. The rationale for the use of these designs and methods was also given.

Chapter 4 outlined the rich narrative data brought about by this qualitative, contextual, exploratory and descriptive study. The findings were aligned to Appreciative Inquiry as the framework of this study. They were also contextually presented with direct quotes from the research participants. The literature control indicated that the findings of this study were found to be significant even in other studies.

The final chapter 5 summarised the findings of this study by identifying and describing the factors influencing the academic performance in biological science of students in a NEI in the EC province. It also presented recommendations for the NEI and recommendations for the ECDoH. Recommendations for further research were also presented. Therefore the implementation of these findings as presented in this study could bring about excellence in the academic performance of the subject biological science at the NEI in the EC province. These findings could also be applied with positive results in other NEIs. Some limitations that occurred during the process of the study were also presented.

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ANNEXURES

A: Ethical approval

A.1 Faculty of health science, ethical committee



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee

23/08/2011

Number:	S116/2011
Title:	Factors influencing the academic outcomes in Biological Science of students in a Nursing Education Institution in the Eastern Cape Province.
Investigator:	Fundiswa Beatrice Tom, Department of Nursing Science; University of Pretoria (Supervisor: Dr. I.M. Coetzee)
Sponsor	None
Study Degree	M. Cur

This Student Protocol was reviewed by the Faculty of Health Sciences, Student Research Ethics Committee, University of Pretoria on 23/08/2011 and found to be acceptable. The approval is valid for a period of 3 years.

Prof M J Bester	BSc (Chemistry and Biochemistry); BSc (Hons)(Biochemistry); MSc (Biochemistry); PhD (Medical Biochemistry) (female)BA et Scien, B Curationis (Hons) (Intensive care Nursing), M Sc (Physiology), PhD (Medicine), M Ed Computer Assisted Education
Prof R Delpoit	MBChB; MMed(Int); MD – Vice-Dean (ex officio)
Prof J A Ker	MD – Vice-Dean (ex officio)
Dr NK Likibi	MBB HM – (Representing Gauteng Department of Health) MPH
Dr MP Mathebula	Deputy CEO: Steve Biko Academic Hospital
Prof A Nienaber	(Female) BA (Hons) (Wits); LLB (Pretoria); LLM (Pretoria); LLD (Pretoria); PhD; Diploma in Datametrics (UNISA)
Prof L M Ntsho	MBChB(Natal); FCS(SA)
Mrs M C Nzeku	(Female) BSc(NUL); MSc Biochem(UCL,UK)
Snr Sr J. Phatoli	(Female) BCur (EtAl); BTech Oncology
Dr R Reynders	MBChB (Pret), FCPaed (CMSA) MRCPCH (Lon) Cert Med. Onc (CMSA)
Dr T Rossouw	(Female) MBChB (cum laude); M.Phil (Applied Ethics) (cum laude), MPH (Biostatistics and Epidemiology (cum laude), D.Phil
Mr Y Sikweyiya	MPH (Umea University Umea, Sweden); Master Level Fellowship (Research Ethics) (Pretoria and UKZN); Post Grad. Diploma in Health Promotion (Unitra); BSc in Health Promotion (Unitra)
Dr L Schoeman	(Female) BPharm (NWU); BAHons (Psychology)(UP); PhD (UKZN); International Diploma in Research Ethics (UCT)
Dr R Sommers	Vice-Chair (Female) - MBChB; MMed (Int); MPharMed.
Prof T J P Swart	BChD, MSc (Odont), MChD (Oral Path), PGCHE
Prof C W van Staden	Chairperson - MBChB, MMed (Psych); MD, FCPsych; FTCL; UPLM; Dept of Psychiatry

Student Ethics Sub-Committee

Prof R S K Apatu	MBChB (Legon,UG); PhD (Cantab); PGDip International Research Ethics (UCT)
Mrs N Briers	(female) BSc (Stell); BSc Hons (Pretoria); MSc (Pretoria); DHETP (Pretoria)
Prof M M Ehlers	(female) BSc (Agric) Microbiology (Pret); BSc (Agric) Hons Microbiology (Pret); MSc (Agric) Microbiology (Pret); PhD Microbiology (Pret); Post Doctoral Fellow (Pret)
Dr R Leech	(female) B.Art et Scien; BA Cur; BA (Hons); M (ECI); PhD Nursing Science
Dr S A S Olorunju	BSc (Hons). Stats (Ahmadu Bello University –Nigeria); MSc (Applied Statistics (UKC United Kingdom); PhD (Ahmadu Bello University – Nigeria)
Dr L Schoeman	CHAIRPERSON: (female) BPharm (North West); BAHons (Psychology)(Pretoria); PhD (KwaZulu-Natal); International Diploma in Research Ethics (UCT)
Dr R Sommers	Vice-Chair (Female) MBChB; M.Med (Int); MPhar.Med
Prof L Sykes	(female) BSc, BDS, M Dent (Pros)



DR L SCHOEMAN; BPharm, BA Hons (Psy), PhD;
Dip. International Research Ethics
CHAIRPERSON of the Faculty of Health Sciences
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DR R SOMMERS; MBChB; M.Med (Int); MPhar.Med.
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Faculty of Health Sciences Research Ethics Committee

7/12/2011

Amendment :	Change in: Title
Number:	S116 /2011
TITLE :	Factors influencing the academic performance in biological science of students in a nursing education institution in the Eastern Cape Province
Investigator :	Fundiswa Beatrice Tom, Department of Nursing Science; University of Pretoria (Supervisor : Dr. I.M. Coetzee)
Sponsor :	None
Study Degree:	MCur

This Amendment "Change in: Title" was reviewed by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria on 7/12/2011 and found to be acceptable.

Prof M J Bester	BSc (Chemistry and Biochemistry); BSc (Hons)(Biochemistry); MSc (Biochemistry); PhD (Medical Biochemistry)
Prof R Delport	(female)BA et Scien, B Curatonis (Hons) (Intensive care Nursing), M Sc (Physiology), PhD (Medicine), M Ed Computer Assisted Education
Prof J A Ker	MBChB; MMed(Int); MD – Vice-Dean (ex officio)
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Prof L Sykes	(female) BSc, BDS, MDent (Pros)

L. Schoeman

R. Sommers

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Student Research Ethics Committee, University of Pretoria

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A.2 Eastern Cape: Department of Health



Province of the
EASTERN CAPE
HEALTH

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Website: www.ecdoh.gov.za

TO: MRS FB TOM

STUDY TOPIC: FACTORS INFLUENCING THE ACADEMIC OUTCOMES IN BIOLOGICAL SCIENCE OF STUDENTS IN A NURSING EDUCATION INSTITUTION IN THE EASTERN CAPE PROVINCE

The Eastern Cape Department of Health acknowledges receipt of your research proposal for the intended research study towards the fulfillment of the M. Cur degree in Nursing Education. The department would like to inform you that your application has been provisionally approved. The final departmental approval will only be granted when you submitted your final ethics committee approval to Epidemiological Research and Surveillance Management unit of the department of health.

Kind Regards,

Zonwabele Merile

Manager: Epidemiological Research and Surveillance Management

Date: 04/07/2011



Eastern Cape Department of Health

Enquiries: Zonwabele Merile
Date: 24th August 2011
e-mail address: zonwabele.merile@impilo.ecprov.gov.za
Tel No: 040 608 0830
Fax No: 043 642 1409

Dear Mrs F. Tom

Re: Factors influencing the academic outcomes in Biological Science students in a nursing education institution in the Eastern Cape Province

The Department of Health would like to inform you that your application for conducting a research on the abovementioned topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health.
2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.
3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.
4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Epidemiological Research & Surveillance Management. You may be invited to the department to come and present your research findings with your implementable recommendations.
5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

DEPUTY DIRECTOR: EPIDEMIOLOGICAL RESEARCH & SURVEILLANCE MANAGEMENT



'Ikamva eliquambileyo'

A.3: Nursing Education Institution



HUMAN RESOURCE DEVELOPMENT: LILITHA COLLEGE OF NURSING IN ASSOCIATION WITH THE CONSORTIUM OF UNIVERSITIES (WSU, UFH and NMMU)

Independence Avenue Global Life Building BHISHO 5608
Private Bag X0028 BHISHO Eastern Cape 5608
TEL: 040 608 9688 FAX: 040 6089689/0866816407 CELL: 0833780098
EMAIL: nomvuyiseko.links@impilo.ecprov.gov.za

TO	MRS F TOM
FROM	MRS N LINKS: PRINCIPAL: LILITHA COLLEGE OF NURSING
DATE	04 JULY 2011
SUBJECT	PERMISSION TO CONDUCT RESEARCH: LILITHA COLLEGE OF NURSING CAMPUSES

1. The subject matter above refers.
2. This correspondence serves to confirm that permission is hereby granted for you to conduct research at the five main campuses of Lilitha College of Nursing.
3. The college will be waiting to be forwarded the results/recommendations from your study for implementation purposes by the college campuses.
4. The organisation takes this opportunity to wish you success in your studies.

.....
Mrs N Links: Principal: Lilitha College of Nursing

United in achieving quality health care for all
24 hour call centre: 0800 0323 64
Website: www.ecdoh.gov.za



Ikamva eliqazambileyo!

B: Participant information leaflet and informed content

Participation leaflet and informed consent Students

Dear student

You are invited to participate in the Appreciative Inquiry (AI) research project for nursing students that will take place at your nursing education institution. This information leaflet contains information that will help you understand your role in the study. If there is any need for further clarification, please feel free to contact the researcher at any time.

TITLE OF STUDY

Factors influencing the academic performance in Biological Sciences of students in a Nursing education Institution in the Eastern Cape Province.

2) The purpose and objectives of the study

You are invited to take part in a research study. Your participation will be as a nursing student registered for the comprehensive four year nursing programme.

The overall aim of this research is to, by means of AI, explore and describe the factors influencing the academic outcomes of students in the subject Biological science at a specific NEI.

In order to achieve this aim, the specific objectives of the research are:

Objective 1: Discover "*what is*" in collaboration with the second year students studying Biological Sciences in the comprehensive four-year nursing programme, explore and describe the factors influencing academic outcomes of students in the subject Biological Science.

Objective 2: Describe "*what should be*" within the four-year comprehensive programme, make recommendations to NEI and the Department of health, based on the findings of the study.

3) 2) Explanation of procedures to be followed

You as a nursing student are invited to participate in an AI based study to explore and describe the factors influencing academic outcomes of students in the subject Biological Science. Based on the findings of the study recommendations will be made to the NEI and the Department of Health.

3) Risk and discomfort involved

As a participating nursing student, you will experience no discomfort. There is also no risk involved in this study. However, your input into this study will require some of your time and effort.

4) Benefits of the study

Appreciative Inquiry looks at organisational issues, challenges, and concerns in a significantly different way. Thus, instead of focusing on problems, organisational members first discover what is working particular well in their organisation. Then, instead of analysing possible causes and solutions, they envision what might be like if "*the best of what is*" occurred more frequently.

The power of AI is the way in which participants become engaged and inspired by focusing on their own positive experiences. AI does address issues and problems, but from a different and often more constructive perspective: it reframes problem statements into a focus on strengths and successes (Coghlan, Preskill, & Catsambas 2003:5).

This has a positive influence on members of an organisation, once the members feel motivated, valued and appreciated, their internal motivation, attitude's and co-operation with colleagues improve and together they can move the organisation forward towards co-constructed goals/outcomes.

5) Voluntary participation in and withdrawal from the study

Participation occurs on a voluntary basis, and you can withdraw from the study without stating any reason should you no longer wish to take part.

6) Ethical approval

The Faculty of Health Sciences' Research Ethics Committee at the University of Pretoria, as well as Eastern Cape Department of Health, has given written approval for this study.

7) Additional information

If you have any questions about your participation in this Appreciative Inquiry based study, you should contact the researcher, Ms F.B. Tom –

Work telephone: (040) 608-9687

Cell phone: 083 378 0444

Email address: fundiswa.tom@impilo.ecprov.gov.za

8) Confidentiality

Your input into this research will be kept confidential. Results will be published and presented in such a manner that you as a participant will remain anonymous.

9) Consent to participate in this study

Your participation in this research is subject to reading and accepting the above information and signing the informed consent document below.

INFORMED CONSENT

I, student number.....have read the above information leaflet and fully understand what is expected of me. Its content and meaning have been explained to me. I have been given the opportunity to ask questions and received satisfactory answers. I hereby volunteer to take part in this research.

4)

Participant's signature

Date

.....
Fundiswa Tom
Researcher

C: Example of data analysis

A collaborative effort to enhance the academic outcomes for biological science in a nursing education institution in the Eastern Cape Province.

Appreciative interview schedule Students

- 1) Reflecting back on your biological science studies in first and second year, what was your most satisfying/peak experience? (Please write me the story)

In my first year, the most satisfying experience was that I have an understanding of Biological science as I did the basics at High school so it was some sort of continuation. The bones were challenging but I did overcome these challenging. Another satisfying experience was to pass my first year but just pass because I enquired all the information that I needed as a basic for my second year.

It is the continuation of what I have done at school

Passing my 1st yr. of my tests in 2nd yr

In my second year due to the understanding and foundation from my first year I have manage to pass all the tests. An now the information that I have I see my self doing well in my final exams.

too pass!

A collaborative effort to enhance the academic outcomes for biological science in a nursing education institution in the Eastern Cape Province.

2) What are your wishes for the subject Biological science?

My wishes for Biological Science is to see all the student doing well in this subject, and getting all the necessary equipment, expertise to help the student pass this subject with flying colours.

Get the necessary equipment to assist students to pass.

3) What do you see as challenges for the subject Biological science?

The first challenge is us students because we tend to see BNS as a difficult subject before even touching it or reading it, meaning that its all in the mind and we are not physical and mentally strong to challenge the task that comes with this subject.

It's hard to see it as difficult even before studying it.

A collaborative effort to enhance the academic outcomes for biological science in a nursing education institution in the Eastern Cape Province.

4) What is your vision for the subject biological?

My vision is to see BNS being loved by the students and being a major subject

Loved by students.
Major subject.

5) If you could make any recommendations or suggestions from a students point of view to improve the outcome in the subject Biological sciences what will it be?

Is to work hard towards passing BNS.
The students to love BNS.
Students to buy books for BNS.

Work hard towards passing it
Love it
Buy books

Thank you for your participation. Your inputs are appreciated.

D: Co-coder letter

Annatjie van der Wath (M Cur Psychiatric Nursing) annavdw@mweb.co.za

Qualitative Data Analysis

M Cur Nursing Science

Fundiswa Tom

This serves to confirm that Annatjie van der Wath has co-coded the following qualitative data: 80 appreciative inquiry interview schedules for the study:

**FACTORS INFLUENCING THE ACADEMIC OUTCOMES IN BIOLOGICAL
SCIENCE OF STUDENTS IN A NURSING EDUCATION INSTITUTION IN
THE EASTERN CAPE PROVINCE**

I declare that the candidate and I have reached consensus on the major themes and categories as reflected in the findings during a consensus discussion.

Annatjie van der Wath (M Cur Psychiatric Nursing) annavdw@mweb.co.za

The data recorded in the notebook was read again for each campus. Then the data from all the campuses was grouped into major themes per each subsection of the interview schedule. Then various sub themes were grouped under each major theme. Themes and sub themes that were unique to a particular campus were noted. The themes and sub themes were constantly compared to the study topic and objectives so as to promote alignment.

Step 6

A detailed discussion of the themes and subthemes was presented. This discussion was further clarified by means of visuals like figures and tables. During the discussion the themes and sub themes were linked to the 4D cycle of Appreciative Inquiry as the framework of this study.

Saturation of data was achieved related to the major themes – The researcher received all the completed interview schedules. Twenty schedules from each campus was analysed after which data saturation was achieved,

E: Letter from editor: