

**STUDENT NURSES PERSPECTIVES OF THE HIGH FAILURE RATE  
IN BIOLOGICAL SCIENCES**

by

**MOTSHEDISI MAVIS MOSEBI**

submitted in accordance with the requirements  
for the degree of

**MASTER OF ARTS**

in the subject  
Nursing Science  
at the

**UNIVERSITY OF SOUTH AFRICA**

**SUPERVISOR: DR. M. E. CHAUKE**

**NOVEMBER 2019**

## **DEDICATION**

I dedicate this work to my late parents, Mosoeu Lebesane and Masetjhaba Lebesane, who gave me the greatest gift of believing in myself even in tough times. I also dedicate this work to my husband Dr S. J. Mosebi for his continued support and encouragement, my two boys Kamohelo and Itumeleng Mosebi, my pillars of strength and to my lovely daughter Refilwe for her unwavering love, support and understanding during crunch times.

## DECLARATION

Name: MOTSHEDISI MAVIS MOSEBI

Student number: 30154677

Degree: MASTER OF ARTS NURSING SCIENCE

I declare that **STUDENT NURSES PERSPECTIVE OF THE HIGH FAILURE RATE IN BIOLOGICAL SCIENCES** is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references and this work has not been submitted for any other degree at any other institution.

Signature:



Date November 2019

**M.M. Mosebi**

## ACKNOWLEDGEMENTS

My sincerest gratitude to:

- The Almighty God, the Creator and Preserver who blessed me with strength, endurance, patience and guidance throughout this formidable project. I was reminded that I can do all this through him who gives me strength (Philippians 4:13)
- Dr. Motshedisi E. Chauke for her encouragement, supervision and unconditional support throughout this project. You drove me to maximize my full potential, and for that, I will forever be grateful.
- The Free State Department of Health and the Nursing Education institution for giving me permission to conduct the study. The Free State Department of Health without the bursary funding, this work would have not been realized.
- Mrs R Tlometsane for the excellent technical editing done to improve the quality of this dissertation
- All the participants who contributed selflessly to provide useful information, without which this study would not have been possible. From the bottom of my heart, I thank you.
- My heartfelt appreciation to my family, my husband Dr. S J Mosebi, and children Kamohelo, Itumeleng and Refilwe for their continued support and unwavering love, I am indebted to you.
- Mrs. G.N. Adonis-Magobolo, my friend and colleague for your encouragement throughout the journey. Thank you.
- To my late parents for instilling in me the tenacity to persevere. I am deeply grateful.

# **STUDENT NURSES PERSPECTIVES OF THE HIGH FAILURE RATE IN BIOLOGICAL SCIENCES**

**STUDENT NUMBER: 30154677**

**STUDENT: MOTSHEDISI MAVIS MOSEBI**

**DEGREE: MASTER OF ARTS NURSING SCIENCE**

**DEPARTMENT: HEALTH STUDIES, UNIVERSITY OF SOUTH AFRICA**

**SUPERVISOR: DR M. E CHAUKE**

## **ABSTRACT**

This study, using qualitative exploratory, descriptive and contextual research design, explored and described student nurses' perspectives of the high failure rate in biological sciences. The study was conducted at one of the campuses of the school of nursing in the Free State province of South Africa. A purposively selected sample of 1<sup>st</sup> and 2<sup>nd</sup> year student nurses registered for the programme of education and training leading to registration as a nurse (general, psychiatric and community) and Midwife (R425, 1985; paragraph (iii) as amended) at the selected campus of the School of Nursing in the Free State was used. World café was utilized for data collection. Thematic analysis of data done using Braun and Clarke (2006) and for world café participants' created documents, Blakeman, Samuelson and McEvoy (2012) method of document analysis was applied.

The findings identified the internal and external causes of high failure rate in biological. Internal causes included students-related factors, which included difficulty in understanding the content and lack of motivation. The external causes involved content overload, inadequate utilisation of available limited resources, ineffective teaching methods and unfair assessment practices. Suggestions that were made by the students to improve the success rate in biological sciences were based on the perceived causes. Recommendations made included in-service education on interactive, evidence-based teaching learning methods in anatomy and physiology, provision of support for students with no background knowledge of biological sciences.

Key words; failure rate, biological sciences, anatomy, physiology, world café

# TABLE OF CONTENT

DEDICATION.....	ii
DECLARATION .....	iii
ACKNOWLEDGEMENTS .....	iv
ABSTRACT.....	v
<b>CHAPTER 1 .....</b>	<b>1</b>
<b>ORIENTATION TO THE STUDY .....</b>	<b>1</b>
1.1 INTRODUCTION.....	1
1.2 BACKGROUND INFORMATION TO THE RESEARCH PROBLEM.....	2
1.3 STATEMENT OF THE RESEARCH PROBLEM.....	3
1.4 RESEARCH PURPOSE AND OBJECTIVES.....	4
1.5 SIGNIFICANCE OF THE STUDY .....	4
1.6 DEFINITIONS OF KEY CONCEPTS.....	5
1.7 PARADIGMATIC APPROACH TO THE STUDY .....	6
1.8 RESEARCH DESIGN AND METHODS .....	8
1.9 SCOPE OF THE STUDY .....	8
1.10 STRUCTURE OF THE DISSERTATION.....	8
1.11 CONCLUSION.....	9
<b>CHAPTER 2 .....</b>	<b>10</b>
<b>LITERATURE REVIEW .....</b>	<b>10</b>
2.1 INTRODUCTION.....	10
2.2 PURPOSE OF THE LITERATURE REVIEW .....	10
2.3 SCOPE OF THE LITERATURE REVIEW .....	10
2.4 WORLD CAFÉ.....	11
2.4.1 Background of the World Café.....	11
2.4.2 World café defined .....	12
2.4.3 Characteristics of world café.....	12
2.4.4 Advantages and disadvantages of world café.....	15
2.4.5 Assumptions of world café.....	17
2.4.6 The World Café principles for hosting conversations.....	17

2.4.8	Application of world café to the study .....	23
2.4.9	Phases of world café .....	24
2.4.10	World café and constructivism .....	26
2.5	CONCLUSION.....	27
<b>CHAPTER 3</b>	<b>.....</b>	<b>27</b>
<b>RESEARCH DESIGN AND METHODS</b>	<b>.....</b>	<b>28</b>
3.1	INTRODUCTION.....	28
3.2	RESEARCH PURPOSE AND OBJECTIVES.....	28
3.3	RESEARCH DESIGN .....	28
3.3.1	Qualitative research .....	29
3.3.2	Exploratory research.....	29
3.3.3	Descriptive research .....	30
3.3.4	Contextual research .....	30
3.4	RESEARCH METHODS .....	30
3.4.1	Population.....	31
3.4.2	Sample and sampling procedure.....	32
3.4.3	Sample size .....	32
3.4.4	Data collection method and instrument.....	33
3.4.5	Data collection process.....	33
3.4.7	Data analysis.....	36
3.5	MEASURES TO ENSURE TRUSTWORTHINESS.....	41
3.5.1	Credibility.....	42
3.5.2	Transferability.....	42
3.5.3	Dependability.....	43
3.5.4	Confirmability.....	43
3.6	ETHICAL CONSIDERATIONS .....	43
3.6.1	The respondents: respect for persons.....	44
3.6.2	Institutions .....	46
3.6.3	Scientific integrity .....	46
3.7	CONCLUSION.....	47

<b>CHAPTER 4 .....</b>	<b>47</b>
<b>ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS.....</b>	<b>48</b>
4.1 INTRODUCTION.....	48
4.2 DATA MANAGEMENT AND PRESENTATION .....	48
4.3 DATA ANALYSIS .....	48
4.4 STUDY FINDINGS .....	48
4.4.1 Sample description.....	49
4.4.2 Themes.....	49
4.5 OVERVIEW OF RESEARCH FINDINGS .....	62
4.6 CONCLUSION.....	63
<b>CHAPTER 5 .....</b>	<b>64</b>
<b>RESEARCH FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY.....</b>	<b>64</b>
5.1 INTRODUCTION.....	64
5.2 RESEARCH DESIGN AND METHODS .....	64
5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS ..	65
5.3.1 Internal factors.....	67
5.3.2 External factors .....	70
5.4 RECOMMENDATIONS.....	76
5.4.1 For practice.....	76
5.4.2 Future research .....	77
5.5 LIMITATIONS .....	77
5.6 SIGNIFICANCE OF THE STUDY .....	77
5.7 CONCLUSION.....	77



## LIST OF TABLES

Table 1.1:	Failure rate in anatomy and physiology .....	3
Table 1.2:	Organization of the dissertation according to five chapters .....	9
Table 3.1:	Braun and Clarke's six phase framework for analysis.....	49
Table 4.1:	Preliminary summary of themes, categories and subcategories .....	49
Table 4.2:	Final summary of themes, categories and subcategories.....	57

## LIST OF FIGURES

Figure 2.1:	The principles for hosting Cafés, reproduced from Word Café Toolkit .	18
Figure 3.1:	The venue for the World Café .....	35
Figure 3.2:	Participants' notes .....	37
Figure 3.3:	The venue for the World Café .....	40
Figure 5.1:	Schematic presentation of the causes of high failure rate in biological sciences from the student nurses perspective .....	66

## LIST ANNEXES

Annexure A:	Ethical Clearance to conduct the study.....	92
Annexure B:	Application for permission to conduct the study, Free State Department of Health.....	94
Annexure C:	Approval letter from Free State Department of Health .....	97
Annexure D:	Application for permission to conduct the study Free State School of Nursing.....	98
Annexure E:	Approval letter from Free State School of Nursing (Principal of the School).....	101
Annexure F:	Data collection instrument .....	102
Annexure G:	Participant information leaflet and consent form .....	103
Annexure H:	World café focus group interview guide.....	105
Annexure I:	Confidentiality binding agreement.....	107

# CHAPTER 1

## ORIENTATION TO THE STUDY

### 1.1 INTRODUCTION

In nursing education, like many other health sciences programs, biological sciences form a crucial part of the undergraduate nursing curriculum. A good understanding of biological sciences, in particular anatomy and physiology is important for all health care professionals as it underpins clinical decision-making (Mayner, Gillham & Sansoni 2013:182). For nurses, anatomy and physiology provide a foundation and scientific basis for nursing practice. A detailed knowledge of where and how to palpate, percuss or auscultate is essential for adequate assessment, planning and provision of treatment and care (Johnston 2010:1) while the knowledge of physiology enhances student nurses' understanding of the pathophysiology, clinical assessment and many nursing procedures (Reid 1997 cited in Johnston 2010:2). Mayner et al (2013: 182) attribute theory-practice gap to poor recall, understanding and application of anatomy and physiology theory to practice.

Research has shown that success in anatomy and physiology correlates with success later in the program and with passing state licensure examinations. According to Montayre and Sparks (2017: 217), nurses who have mastered biological sciences, including anatomy and physiology are confident and competent practitioners who are capable of providing clinically effective patient care. Bergman, de Bruin, Herrler, Verheijen, Scherpbier and Vleutin (2013:2) corroborate this view by stating that, for many clinical specialties, a good knowledge of biological sciences is important for ensuring safe and efficient clinical practice.

A plethora of studies conducted globally shows high failure rates in biological sciences among student nurses, in particular anatomy and physiology. High failure rates in anatomy and physiology are also common at nursing education institutions across South Africa (Brown et al 2016; Crane & Cox, 2013; Gultice, Witham & Kallmeyer 2015; Higgins-Opitz & Tufts 2013; White, Madigan & Drinkwater 2011; Mohudi 2013).

High failure rates in anatomy and physiology often presents many challenges including;

- Delays in student nurses' progress through the programmes, delays in career paths of students, and many student nurses may be discouraged to persist when experiencing challenges (Sturges & Maurier 2013 cited in Thalluri 2016).
- Low morale among student nurses and nurse educators. Students become overwhelmed by failure, as they may have to carry anatomy and physiology over to the next level of training with resultant increased academic workload. The increased academic workload places a huge stress on the students and can affect performance in other subjects.
- Shortage of nurses on the already overburdened health workforce, affecting negatively the health system's objective of delivering effective health care services (Manson 2014:1; Langtree 2014:1; Doggrel & Schaffer 2016).
- Student nurses' attrition and unemployment. Attrition of student nurses is a big concern globally and considered a waste of both human and material resources (Manson 2014: 1).
- Financial loss for the government because once the students drop out, chances of repaying the bursary diminish due to unemployment on leaving student position through failure.

## **1.2 BACKGROUND INFORMATION TO THE RESEARCH PROBLEM**

At the school of nursing where the study was done, anatomy and physiology are taught as biological sciences subjects within the basic nursing curriculum. Other biological sciences subjects offered at the college include biochemistry, microbiology, parasitology, pharmacology and biophysics (Free State [FS] School of Nursing curriculum 2002: 32, 41).

Anatomy and physiology are offered at first and second year of training in the basic program of education and training leading to registration as a nurse (general, psychiatric and community) and a midwife (R425, 1985; paragraph (iii) as amended) (South African Nursing Council: 2008).

At first year, human anatomy and physiology are introduced, while in second year, the anatomy and physiology taught are related to specific body systems. Biological science content require 100 notional hours (10 credits) for mastery, spread over two blocks within one academic year, that is four weeks per block (four weeks first semester and four weeks second semester), as stipulated in the Free State School of Nursing curriculum (Curriculum 2002: 32, 41).

The teaching strategies used at the school are aimed at enhancing critical thinking and problem solving. The strategies include modules, group work, assignments, demonstrations and lectures (FS School of Nursing Curriculum 2002:39). Formative assessment involves two tests per semester and summative assessment is done in May/June and October/November respectively. The pass mark is 50%. The student nurse who fails the summative assessment is allowed to carry it over to the next level should his or her total credits allow her to be promoted to the next level. The lecturers offer remedial classes to student nurses who struggle to pass anatomy and physiology.

### 1.3 STATEMENT OF THE RESEARCH PROBLEM

Over the past five years, the researcher has observed a continuing trend of failure rate in the two of the biological sciences, namely the anatomy and physiology among student nurses as evidenced by the statistics shown in Table 1.1.

**Table 1.1 Failure rate in anatomy and physiology (2012-2016)**

Year	2012	2013	2014	2015	2016
<b>Anatomy: 1<sup>st</sup> year</b>	28%	26%	40%	42%	35%
<b>Physiology: 2<sup>nd</sup> year</b>	33%	26%	32%	27%	36%

High failure rate in anatomy and physiology frustrates all stakeholders, namely the student nurses, the academic staff and management.

This is because it often delays student nurses' progress through the programme, extends the period of training, increases the dropout rate due to increased workload, and lowers the morale of students. In addition, the high failure rate increases costs for students and the institution.

The causes of continued high failure rate in anatomy and physiology despite the available support for student nurses are not understood, hence the decision to conduct the study.

#### **1.4 RESEARCH PURPOSE AND OBJECTIVES**

The purpose of this study was to explore and describe the student nurses' perspective of the causes of high failure rate in biological sciences and the appropriate measures to improve the success rate in biological sciences

In order to accomplish the purpose of the study, the following objectives were formulated, namely to:

- Explore and describe the student nurses' views, feelings and beliefs regarding the causes of high failure rate in anatomy and physiology
- Explore and describe the student nurses' views, thoughts and beliefs regarding appropriate measures to improve the success rate in anatomy and physiology.

#### **1.5 SIGNIFICANCE OF THE STUDY**

Numerous studies that have been conducted globally and locally on academic performance of student nurses in biological sciences show a poor performance in anatomy and physiology (Dator, Damayathi & Dharmaratne 2016, Gultice, Witham & Kallmeyer 2014; Jafta 2013; Makhoba 2016; Mohudi 2013). However, research information on the student nurses' perspective of the causes of high failure rate in anatomy and physiology is inadequate. The findings of this study have the potential to fill this gap in literature and to contribute to the body of knowledge regarding cause of high failure rate in anatomy and physiology from the student nurses' perspective.

In addition, the findings of the study have the potential to provide deeper insights into the student nurses' perspective of the causes of high failure rate in anatomy and

physiology as well as appropriate measures for improving the pass rate in the two subjects. This will assist nurse educators to develop and implement appropriate intervention strategies based on the student nurses' suggested measures to improve the pass rate in anatomy and physiology.

## **1.6 DEFINITIONS OF KEY CONCEPTS**

The following concepts were identified as key to this study;

### **Anatomy and physiology**

Anatomy is the study of the structure of the body and the physical relationship between those structures while physiology refers to the study of how the body systems work and the way in which their integrated activities maintain life and health of the individual (Waugh & Grant 2014:4).

### **Biological sciences**

Biological sciences are subjects in the curriculum for the four-year Diploma programme of Nursing, leading to registration as a Nurse (General, Psychiatric and Community) and Midwife. The content of the biological science comprise anatomy, physiology, parasitology, biophysics, pharmacology and microbiology. In the context of this study, biological sciences refer to anatomy and physiology, which are offered at first and second level of training in the four-year diploma nursing programme.

### **Causes**

Causes refer to that which gives rise to any action, phenomenon or condition (Oxford English Dictionary 2018). For the purposes of this study, causes are events or persons that the student nurses perceive as responsible for the high failure in anatomy and physiology

### **Failure**

According to Longman Exams Coach (2007) failure is the state or condition of not meeting the intended or desirable outcome.

In the context of the current study, failure means obtaining less than a pass mark of 50% in anatomy and physiology tests and examinations as stipulated in the FS Nursing School Assessment Policy (2002) of the selected school of nursing.

### **Failure rate**

Failure rate is the number of times that something fails or lack success in achieving the intended outcomes or desirable outcome in a given period and in some given unit of measure.

### **Perspective**

A particular way of thinking about something or a point of view (Oxford Advanced Learner's Dictionary 2010:1132). In the context of the study, perspective refers to student nurses' views, opinions, beliefs, thoughts and feelings about the causes of high failure rate in anatomy and physiology and appropriate measures to implement to improve the success rate in anatomy and physiology.

### **School of nursing**

An accredited post-secondary nursing education institution that has complied with the prescribed standards and conditions for education and training of nurses (South Africa 2008:5).

### **Student nurses**

Student nurses are 1<sup>st</sup> and 2<sup>nd</sup> year student nurses undergoing education and training at one school of nursing in the Free State province of South Africa

## **1.7 PARADIGMATIC APPROACH TO THE STUDY**

Polit and Beck (2012:11) define a paradigm as a world view with various philosophical assumptions associated with a particular point of view or a general perspective on the complexities of the world. Brink, Van Rensburg and Van der Walt (2012:25) further explain a paradigm as a way of looking at natural phenomena that encompasses a set of philosophical assumptions. In addition, a paradigm guides one's approach to enquiry. According to Babbie (2007) in De Vos (2011:513), a paradigm is a framework

and perspective based on human philosophies and assumptions about the world around them, as well as the researcher's interpretation of reality.

A constructivist metatheoretical paradigm informs the study. According to Halloway and Wheeler (2010:25), the constructivist paradigm has its roots in philosophy and the human sciences and it acknowledges the existence of many socially constructed, subjectively based realities that consist of stories or meanings grounded in natural settings (Polit & Beck 2012:13). The same authors further explain that the constructivist paradigm is centred on the way in which human beings make sense of their subjective reality and attach meaning to it. Constructivists do not subscribe to the existence of a social and physical reality 'out there' separate from the individual but they emphasise the relationship between socially engendered concept formation and language, as well as the belief that understanding human experience is as important as focusing on explanation, prediction and control. Researchers following this approach are interested in finding meaning and in depth knowledge (Botma, Greeff, Mulaudzi & Wright 2010; Brink et al 2012:121; Scotland 2012:12). The constructivist paradigm contains qualitative research methods.

The use of constructivist paradigm in this study was intended to gain in depth understanding of the student nurses' perspective of the causes of high failure rate in anatomy and physiology and appropriate measures required to improve the success rate in biological sciences.

- Assumptions on which the research was founded

Assumptions refer to basic principles that are accepted as being true based on logic or reason without proof (Polit & Beck 2012:748), self-evident truths, statements or axioms, the truth of which are self-evident to those who hold them regardless of their objective status, meaning or truth value (Leedy & Ormrod 2005:5 in Chauke 2014: 18). Because all research is inevitably based on assumptions, the researcher found it necessary to clarify assumptions to enable the readers to understand the basis on which the research was being conducted. The following assumptions formed the basis of the study:



- Negative perceptions and attitudes toward biological sciences serve as significant barriers to learning and are associated with poor performance in anatomy and physiology among student nurses
- People have the capacity to work together, irrespective of who they are
- Qualitative research (using world café) yields information that meets the requirement of rigorous science and scientific knowledge if abstracted sufficiently
- The participants are autonomous people who will share information willingly and will give honest responses to the questions during interviews.

## **1.8 RESEARCH DESIGN AND METHODS**

An overview of the research design and methods used in this study is given in the paragraphs that follow, but a detailed description of the research methodology is presented in Chapter 3

A qualitative research design was used, with World café as the method of data collection and analysis. The design was contextual in nature. The research methods included the description of the study setting, population, sampling as well as data collection and analysis methods. The discussion of related ethical issues and measures taken to enhance the validity and reliability formed part of the research methods. Details regarding the research design and methods used in this study are discussed in chapter 3.

## **1.9 SCOPE OF THE STUDY**

This study focuses on the exploration and description of student nurses' perspectives of the high failure rate in biological sciences and the description of the recommendations to improve performance in the subject. World Café method is utilized to collect data to gain deeper insights in the perspectives of student nurses.

## **1.10 STRUCTURE OF THE DISSERTATION**

The research report is organized into five chapters as shown in Table 1.2

<b>TABLE 1.2: ORGANIZATION OF THE DISSERTATION ACCORDING TO CHAPTERS</b>	
Chapter 1	Orientation to the study highlighting the problem statement, research questions, and research objectives, significance of the study, a brief introduction to the methodology, and the scope of the study.
Chapter 2	Literature review
Chapter 3	Research design and methods
Chapter 4	Analysis, presentation and description of research findings
Chapter 5	Conclusions and recommendations

### **1.11 CONCLUSION**

The chapter focused on the background and motivation for the study. The research problem, research purpose, objectives and the significance of the study were stated. Operational definitions of concepts related to the study were given and the research design and methods used in the study were introduced. The scope and the structure of the dissertation of the study were outlined. In chapter 2, the literature review is presented.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter discusses the literature review pertinent to the study. A literature review is a written and well-organized presentation of what has been published about a research topic by scholars (Grove et al 2013:97). The review of literature involves systematic identification, location and analysis of documents with information related to the research problem (Gay, Mills & Airasian 2006 cited in Chauke 2014).

#### **2.2 PURPOSE OF THE LITERATURE REVIEW**

It was important to conduct the literature review early in this qualitative research with the aim of broadening the researcher's knowledge base on developments and emerging trends in world café research. In addition, the literature review conducted assisted the researcher to refine and sharpen the focus of the research question, identify appropriate methods for the study and point to an appropriate conceptual framework that would help the researcher interpret the findings of the study (Schmidt & Brown 2015:95). It was also conducted to identify, summarise, synthesize what has been studied earlier, identify gaps in the current body of literature and to provide the rationale for how the study may contribute to the existing body of knowledge (Polit & Beck 2012:116). Schmidt and Brown (2015:95) agree that learning from previous research provides an indispensable contribution to increasing knowledge and understanding in research topic.

#### **2.3 SCOPE OF THE LITERATURE REVIEW**

A computer-assisted search was conducted in the National Library of Medicine PubMed service (PubMed), Ovid Medline, Science Direct, Elsevier databases and Google Scholar, using the key words anatomy, biological sciences, failure rate, physiology and world café. The literature reviewed consisted of abstracts, articles,

dissertations, reports, guides and the research pertaining to the research phenomenon. The search included the work done globally (South Africa included) on the world café and high failure rate in anatomy and physiology from 2009 to 2019. The reference lists from retrieved studies were manually searched.

## **2.4 WORLD CAFÉ**

World Café was used in this study as a qualitative research method, utilising data collection methods such as interviewing, discussion, drawings and narratives, and allowing time for reflection (Du Plessis et al 2012 cited in van Graan, Williams & Koen 2016:282). It was appropriate for the study purpose and objectives because of its emphasis on participants' dialogue for sharing views, stimulating innovative thinking, exploring and discussing issues of concern to them (high failure rate in biological sciences in this study), confronting real life challenges and for making suggestions (Backes & Prochnow 2018:1; Fallon & Connaughton 2016:1). In the following paragraphs, the background information to the world café, its characteristics, assumptions, principles and its uses in research are presented

### **2.4.1 Background of the World Café**

Several years ago, on a rainy day in 1995 the World Café was developed by chance by Juanita Brown and David Isaacs (Bradbury 2015:212; Fallon & Connaughton 2016:1; Lenzo 2014:2). They were waiting for twenty-four business and academic leaders for the second day of a strategic dialogue on Intellectual Capital, and they became worried when the rain could not stop. As the participants arrived, they offered them coffee, and created a comfortable space while waiting for the meeting to begin. They set up small tables in their living room, covered them with paper tablecloths, and created a "café" ambiance like many in their neighborhood cafés (Bradbury 2015:212, Fallon & Connaughton 2016:1, Lenzo 2014:2).

The participants spontaneously formed into small, intimate table conversations about the questions that had drawn them together, jot down ideas and insights on the tablecloths. After a while, someone showed interest about what others were discussing.

One person agreed to stay at each table as a host while others travelled to other tables to figure out what interesting ideas were breeding there, connecting ideas, testing assumptions, and adding to each other's diagrams and pictures on the tablecloths. Through the Café conversations, a shared knowledge base, larger than any individual or group in the room, had become accessible (Bradbury 2015: 212; Fallon & Connaughton 2016:1; Van Wyngaarden, Leech & Coetzee 2018: 522).

The café setting enriched the conversation, stimulated creative ideas and participants learned together in a more engaging and participative way than in traditional meetings (Bradbury 2015: 212; Fallon & Connaughton 2016:1; Van Wyngaarden et al 2018: 522). From gathering the notes from the paper tablecloths, they realized emerging patterns in their conversations and ingenious thoughts that had not been obvious at the beginning (Fallon & Connaughton 2016:1).

#### **2.4.2 World café defined**

World Cafe, sometimes referred to as a knowledge cafe, obtain its name from its setting that mimics a café where small groups (4 or 5 people) are all conversing together around tables. It is a structured conversational process of knowledge sharing in which people discuss a topic at several tables, with individuals switching tables periodically and being introduced to the previous discussion at their new table by a table host (Aldred 2011: 58; Fallon & Connaughton 2016:1; Filies, Yassin & Frantz 2016:1; Torres & Costa Neto 2018:1; Van Wyngaarden, et al 2018: 520). Tan and Brown (2005) cited in Bradbury (2015: 211) add that the World Café is a simple yet powerful conversational process that helps groups small or large to engage in constructive dialogue, to build personal relationships, and to foster collaborative learning. Bradbury (2015:212) further explain that World Cafés aims to create networks of conversations in settings that are inviting, welcoming, non-judgmental, safe and comfortable whilst providing a restaurant ambience. It is progressively becoming a popular method of facilitating productive dialogue between groups or groups of people around an issue that matters to the group as a whole.

#### **2.4.3 Characteristics of world café**

From the many definitions of world café by various authors, the following were identified as many of its characteristics.

- **Active participation**

The World Café method is different from traditional approaches in that its fundamental characteristic involves active participation and has the ability to draw collective wisdom that exist among participants when they listen and pay attention to each other (Lenzo 2014:3). According to Estacio and Karic (2011:13), the World Café's adaptability widens the reach of community engagement in that it encourages the contributions of all the participants Brown and Isaacs (2018:3) hypothesize that the World Café as a methodology and as a metaphor offers a practical yet innovative way to cultivate both the knowledge required to thrive today and the wisdom needed to create the futures we want, rather than being forced to live with the futures we get'. Another distinctive feature of the World Café process is its capacity for both the attachment and scale of participants.

- **Interactive**

The World Café's encourage dialogue between a diverse group of participants by creating an environment where people could feel free to interact, share ideas and socialize with people they may never have met before. According to Estacio and Karic (2011:13) the World Café is regarded as a more realistic 'real world' approach because it considers participants as part of the broader society to which they belong, unlike surveys, albeit considered to be the traditional 'real world' approach, lack the social context present in World Café (Estacio & Karic 2011:13). MacFarlane, Galvin, O'Sullivan, McInerney, Meagher, Burke and LeMaster 2016:279) believe that innovative thinking is more likely to emerge when diverse viewpoints and perspectives contribute to the exploration of subject. In this study diverse viewpoints and perspectives of student nurses were important in establishing factors associated with high failure rate in biological sciences than focusing only on academic planning and management.

Estacio and Karic (2011:13) state that contrary to the traditional focus groups, where group discussion is the primary tool of collecting data, the World Café utilizes a variety of ways, such as writing on table clothes, using drawings, dialogue and writing on the wall.

Booth and Booth (2003) cited in Estacio and Karic (2011:13) consider this as one of the strengths of the World Café's creativity in community engagement. This method of collecting data is advantageous for research as it expands participant engagement thereby gathering insights far richer than if group dialogue was the sole method of data collection (Estacio & Karic 2011:13).

- **Equality**

The World Café method is different from traditional approaches in that its fundamental characteristic involve participation, where everybody's opinion is valued equally (Lenzo 2014:5; MacFarlane et al 2016:279; Löhr, Weinhardt, and Sieber 2013:1).

- **Use of very large numbers of people**

World Cafes have the ability to engage very large numbers of people without losing its ability to bring together people from diverse background, to engage in deep conversations that matter (Lenzo 2014: 5; MacFarlane et al 2016:279). World café method has been utilized globally, in small groups or large groups engaging in conversations that are of mutual interest, in a wide range of settings (Bradbury 2015:211; Fallon & Connaughton 2016:3). What is at the heart of these conversations, are the invisible connections that occur among them and the actions that emerge from them help to build the organization's collective knowledge and shape its future (Brown & Isaacs 2018:3).

- **Collaborative learning and personal relationship building**

According to Tan and Brown (2005: 83) cited in van Wyngaarden et al (2018: 522) the World Café method contributes to personal relationship building and promotes collaborative learning. In addition, world café is best utilized when dealing with topics that require combined wisdom and discussion (Chang & Chen 2015:1284) cited in Van Wyngaarden et al 2018: 522). The World Café is generally known to create a relaxed atmosphere, which offers warmth and friendliness to stimulate collaborative conversations (Estacio & Karic 2015:5; Torres and Costa Neto 2018:3).

As noted by Brown and Isaacs (2018: 5), the World Café employs the principles of dynamic networks and living systems to obtain a source of deeper creativity and shared knowledge that might not be readily available through more traditional approaches to collaborative work. Backes and Prochnow (2018:1) point out that significant learning occurs when there are real meanings for the individuals, related to the context and their knowledge.

- **Constructive possibilities for action**

Fillies et al (2016: 229) presume that creating a hospitable space encourages trust. It is believed that trust can influence the extent to which goals can be achieved (Gill, Ramsey, Leberman & Atkins 2016:101). The creation of a hospitable environment enables participants to feel free to address issues that are challenging to them. Generally it is believed that organizational leaders are more concerned with production than engaging in fruitless conversations. According to Hurley and Brown (2009:3) human beings think together and coordinate action in and through language. The assumption is that through conversation people come to a new level of shared understanding around real-life issues and they want to make a difference. It is believed that participants from World Café conversations, often obtain fresh ideas that they did not know they had within them (Hurly & Brown 2009:3; Gill et al 2016:101).

#### **2.4.4 Advantages and disadvantages of world café**

Traditionally qualitative research utilizes interviews or focus group discussions to answer the research questions. According to Koen (2018:1) these methods often lead to participants feeling inferior to the interviewer, discouraging them to convey their feelings freely. Gibson and Riley (2010) cited in Koen (2018:1) assume that, despite interviews and focus-group discussions creating possibilities to explore the experiences of participants than surveys, these methods still produce a sense of disjuncture between the researcher and the participants. As mentioned by Estacio and Karic (2015), participants who are actively involved generate richer data and an equal relationship between researchers and participants is promoted.

One of the advantages of using World Café is that the participants (student nurses in this study), rather than the researcher are responsible for the conversations and



recommendations for improving the success rate in biological science (Filies et al 2016: 229; MacFarlane et al 2016:279). Carson (2011:1) explains that the World Café provides a constructive alternative to combative and unproductive public meetings, and facilitates a shift from self-interest to the common good. World café creates a welcoming and relaxed atmosphere, which allows free discussion of issues, ideas, sharing of opinions and the participants simply listen to others (Jorgensen & Steier (2013: 6) cited in Van Wyngaarden et al (2018:522).

Bradbury (2015:215) indicates that what is regarded as hospitable to participants may vary across settings and across cultures. The key features of hospitable environment should offer participants free movement between the seats, and it should resemble a café style (Bradbury 2015:215; World Café 2015:8). A welcoming environment also facilitates connecting people, creates conversations and deeper engagements. The conversations created at World Cafés have the ability to draw on the wisdom, widen knowledge base and stimulate creativity of the participants to explore issues of concern to them and to confront real life challenges (Brown & Isaacs 2018:2).

The World Café is based on the premise that people already have within them the wisdom and creativity to confront even the most difficult challenges; that the answers they need are available to them; and that they are wiser as a collective than when they are alone (World Café 2015:2).

World café can be modified to meet a variety of needs with specific focus on context purpose, number of participants and the location. Wiley, Seibel and Bush (2018:3) corroborate this view by stating that World Cafe conversations can be used at all spheres of government and ensure that knowledge can be used by all stakeholders facilitate change and address specific issues.

The disadvantages of world café include that it requires a lot of time and content preparation, as well as practical and organisational elements. Loyens and van Der Walle (2011) note that discussions may be interrupted and stopped abruptly because of the predetermined time allocation even if a debate was very active. It may be advisable to add a few between every group to make a short summary

## 2.4.5 Assumptions of world café

According to Brown and Isaacs (2018:4), world café works from the following assumptions:

- The future is born in networks of human conversation
- Networks are the underlying pattern of living systems
- Conversation is the fundamental process that promotes personal and organizational business.
- Powerful questions encourage collective learning
- Human systems such as organizations, families, communities are living systems (Teza, Miguez, Fernandes, de Souza, Dandolini and de Abreu 2013:1: Torres & Costa Neto 2018:2).

## 2.4.6 The World Café principles for hosting conversations

The core design principles that underpin world café are shown in Figure 2.1. The description of each of the core design principles is presented in the paragraphs that follow.



## **Figure 2.1. Principles for hosting Cafes (World Cafe Toolkit 2015).**

- **Core design principle 1: Set the context and clear purpose**

It is the responsibility of the convener of the meeting to facilitate all the work, from the marketing perspective, invitation of participants to the implementation of the whole process. It is imperative for the convener to have a clear purpose to bring the people together in a World Café and to choose appropriate participants. Clear knowledge of the purpose and the parameters of the meeting enable one to consider and choose the most important elements to realize research objectives (Drais 2017:1; World Café 2015:9). Carson (2011:4) suggests that for most World Cafés participants are believed to be already in possession of the knowledge and lived experience of the topic to be discussed, to stimulate and sustain conversations that stay on topic. As Bradbury (2015:212) point out, the idea is to make clear the collaborative purpose of a World Café to those invited. Context-setting allows the participants to take ownership of the discussions. Bradbury (2015:212) states that the purpose of Café conversations can involve both exploring content and building and maintaining collaborative relationships. It is during this stage that table hosts are identified within the group of participants.

- **Core design principle 2: Host in a hospitable space**

World Café emphasizes creation of hospitable, welcoming and safe space. It is believed that when people feel comfortable to be themselves, they do their most creative thinking, speaking, and listening (World Café: 2015:3). Bradbury (2015:216) highlights that what may seem hospitable to participants may vary across settings and across cultures. The physical spaces created should offer comfortable seating, allow free movement and also imitate a café setting with tables covered with paper table clothes, have snacks and drinks and pens to write and doodle emerging ideas. Unnecessary distractions should be avoided. The surrounding should generate warmth, friendliness and genuineness (Bradbury 2015:212; World Café 2015:8).

- **Core design principle 3: Explore questions that matter**

According to World Café (2015:7), knowledge emanates in response to captivating questions that are well received as they stimulate collaborative engagement and

exploration throughout a system. It is envisaged that powerful questions provide the anchor for the discussion, and consistency to the web of conversations that might spiral off in different directions (Brown & Isaacs 2018: 5). It is however important to ask questions that are relevant to the real-life concerns of the group. Bradbury (2015:216) maintains that a well formulated question is one that probes deeply, allows for rich discussion, and seeks wisdom and knowledge. Questions that begin with “how,” “why,” and “what if” are the most likely to achieve these goals. Brown and Isaacs (2018:5) believe powerful questions have the ability to clarify the intention, focus energy, and direct attention toward what really matters. In this study, the participants were asked the following questions:

1. From your perspective, what are the causes of the high failure rate in biological science?
2. What recommendations do you make to improve the pass rate in biological science?

The questions are simple and clear; yet thought provoking; they aim to generate energy and are focused on inquiry. Enough time should be allocated to ensure extensive deliberation on questions, as it is essential to the success of the world café conversation (World Café 2015: 4).

- **Core design principle 4: Everybody’s contribution matters**

Much as it is important to encourage everyone to contribute their ideas and perspectives in a meeting, allowing anyone who wants to participate by simply listening to do so is also as important (World Café 2015:4). Active participation contributes to making a difference. During a World Cafe the chosen table hosts move from table to table, contributing to a number of conversations around the same question, with different people. By providing opportunities for people to move in several rounds of conversation, ideas, questions, and themes begin to link and connect. At the end of the second or third round, all of the tables or conversation clusters in the room will be cross pollinated with insights from prior conversations. It is suggested a group of four to five people seat at small Café-style tables or in conversation clusters and each group will go through three rounds of conversation for approximately 20 minutes each (Bradbury 2015:216; Fallon & Connaughton 2016:7).

- **Core design principle 5: Connect diverse viewpoints**

One of the defining characteristics of the world café is to link the essence of the participants' discoveries to ever-widening circles of thought. This is achieved by moving between tables and meeting new people with diverse viewpoints and insights (World Café 2015:4). The interactive nature of the world café will create an opportunity for the participants of this study to realize new emerging factors related to the high failure rate in biological science. It will also afford them to have a bigger picture of the relationship between the failure rate or success rate in biological sciences and the external factors. What is crucial is that it will strengthen the bond between them and collectively come up with potential solutions that will benefit all and not individual interests (Fallon & Connaughton 2016:8).

- **Core design principle 6: Listen together for insights and discoveries.**

World Café (2015:4) highlights the quality of listening as the most important factor determining the success of world café. The notion is that through shared listening and paying attention to themes, patterns and insights, an essence of the matter under discussion is understood.

Silence and reflection allow to participants to gain a deeper understanding and insight that would not be readily accessible (World Café 2015:4). In this study, it was imperative that the table hosts encourage the participants explore high failure rate in biological science from multiple diverse perspectives and also to ensure that there was consensus among participants' viewpoints such that they stay relevant. Participants should welcome everybody's inputs and should not be judgmental of others' contributions and experiences (Bradbury 2015: 218; Brown & Issacs 2018:7; Fallon & Connaughton 2016:8; World Café 2015:4).

- **Core design principle 7: Participants share collective discoveries.**

By providing paper and markers to participants, Carson (2011: 9) hypothesizes that it is a way of encouraging the use of "shared space" where people can expand on each other's perspectives, link their thoughts, and engage in deeper collaborative listening whereby new knowledge can develop. The table hosts are able to identify recurrent pieces of information that intrigue participants and establish the flow of the conversation as well as hindrances (Fallon & Connaughton 2016:8; Koen et al 2018:18).

When the seven core design principles are used together, they create collaborative dialogue, active participation, and constructive possibilities for action. However, the format is not rigid and may adapt to various situations (Van Wyngaarden et al (2018:523; World Café: 2015).

#### **2.4.7 The use of world café in research**

The World Café is considered to be an invaluable and yet simple and easy to use method to engage communities, health, education and business sectors (Bradbury 2015: 211; Chang and Chen 2014:1, World Café 2015:2). It been used extensively in these sectors globally to encourage discussions around issues that matter and subsequently obtaining a deeper understanding and insight in the matters of concern (Fallon and Connaughton 2016:3; Lagrosen 2017:1). Koen, du Plessis and Koen (2018: 28) report that after being introduced to the World Café symposium in South Africa in 2011, initially meant to facilitate social change, noticed that the method could be used as a qualitative data collection method in their structured methodology.

Lagrosen (2017) cited in Torres and Costa Neto (2018:4) postulates that it is a useful qualitative research method to explore the views of many people in order to create value that is truly meaningful.

Botha-Verhage and Jacobs (2017:218) used World Cafe to gain a deeper understanding and insight into how mothers in a South African low socio economic environment, envisage what their future relationship with their children might be. The World Café was also used in Cape Town, South Africa to explore Ubuntu, and what it meant to the participants' lives and work (Lenzo 2014). Through developing a "culture of health" aimed to reduce diabetes-related inequalities for older adults in rural counties of Kentucky, all key stakeholders were invited to the World Cafe. A diverse group of community members, government and business leaders were invited to discuss topics that matter to their community (Yankeelov, Faul, & D'Ambrosio 2018:1). Hurly and Brown (2009:4) state that critical questions highlight the necessity to have diverse voices to represent key parts of a system or give multiple perspectives on an issue presented. The café lead to the development of a strategic plan and a scorecard and, ultimately, community empowerment with regard to healthy living particularly of Senior Citizens (Yankeelov et al 2018:1). MacFarlane (2016:278) analyzed the use of World Cafés as a participatory method by engaging diverse group of community members and health care stakeholders and found it to be useful in facilitating purposeful, collaborative engagement regarding research prioritization for primary care health service improvement. The involvement of multiple stakeholders contribute to a network of ideas and insights to fully comprehend the issues that matter, thereby generating creative solutions to support for organizational or community change (Hurley & Brown 2009:5).

In the educational context, Teza et al (2013:1) acknowledge the prevalent claims that the students dislike the traditional way of teaching, and their complaint about the boredom of having to listen to the teachers talk for hours. The same authors initiated a platform for students and teachers with the purpose of generating deeper insights and ideas for an event proposed by the institution, and found it to be useful and recommended it for future use.

Balata (2018:1) used World Café to understand what students feel they need from innovative teaching practices in order to foster intercultural skill development, and to share the results with educators in order to amend their current methods and improve the development of intercultural skills with their students. Van Wyngaarden et al (2018) used the World Café data collection method to explore nurse educators' professional journey through action research. World Café allowed nurse educators to reflect on own practices and develop critical thinking and clinical reasoning skills. Van Wyngaarden et al (2018:529-530) concluded that World Cafe can also be used in nursing education as a teaching method, so that students can explore various topics of interest while generating skills in communication, building relationships and collaborative learning.

The highlight of utilizing World Café as method of engaging multiple stakeholders for issues that matters, was when it was used by Broom, Brady, Kecskes and Kildea (2013) during the design process for a Neonatal Intensive Care Unit project. It facilitated stakeholders' discovery to multiple ideas and new insights regarding the design of a new Neonatal Intensive Unit (Broom et al 2013:253). Van Graan, Williams and Koen (2016) did not only use the method to establish an understanding of the professional nurses perception of clinical judgment within the South African clinical nursing environment but utilized the findings to contribute to the body of knowledge relating to clinical judgment as an essential skill for improving autonomous and accountable nursing care.

#### **2.4.8 Application of world café to the study**

A proper assessment of whether the method will be appropriate for the desired purpose or not should be conducted, and that the earmarked participants should be conversant with the topic or question under discussion and be trustworthy, dependable and reliable to provide relevant information. The convener should also consider the number of the invites such that it will allow stimulation of different perspectives, taking into consideration the availability of a hospitable space (World Café 2015:2).

In this study, the participants were given the opportunity to discuss their views and opinions regarding the causes of high failure rate, as well as measures they thought would improve the pass rate in biological sciences. The length of sessions that participants take before they rotate to other tables, allows them to gain insight,



innovation and can bring about different opinions on the subject under discussion (Fallon & Connaughton 2016:3; World Café 2015:2).

#### **2.4.9 Phases of world café**

The world café process comprises three phases, namely the preparatory, implementation and the closing phases

- **Preparatory Phase**

The convener or facilitator of the world cafe should be conversant with the processes and must have experience in conducting workshops and to have a clear purpose for organizing World café (Drais 2017:1). Hurly and Brown (2009: 4) state that clarifying the purpose or strategic intent is the first step in designing ways to engage people, indicating that the purpose determines which issues or opportunities are important and which questions matter. Drais (2017:1) further explain that it is crucial to select topics or powerful questions that matter to the invited participants. It is hypothesized that issues that matter focus attention, evoke passion and generate energy. The World Café conversations are both about discovering and exploring powerful topics (Hurly and Brown 2009:4; Drais 2017:1) Having a clear purpose informs the convener to consider carefully which target group is suitable to accomplish the desired result of the event (Drais 2017:1).

The second principle of the World Café is about creating a hospitable environment (World Café 2015:3). It is therefore necessary that preparation of the event should include securing a room with enough light, and creating a welcoming atmosphere that display a café ambiance. The room should be large enough to allow arrangement of tables that seat 4-6 people and also allow free movement. Tables should be covered with writable tablecloths. Refreshments and pot plants are put on the tables including markers for scribbling ideas. Music should be soft to avoid distractions. (Stöckigt, Teut and Witt 2013: 2) cited in van Wyngaarden (2018: 524) report that non-threatening environment enable participants to share ideas and stimulate creativity.

Van Wyngaarden (2018:524) further state that participants who feel comfortable and relaxed may become more creative in their thinking, speaking and listening abilities.

- **Implementation Phase**

The convener of the World Café opens the event with a warm welcome and provides a brief introduction to the World Café method and the purpose of the event. Participants are put at ease by sharing the World Cafe Etiquette and explaining the World Café process (Drais 2017:1). The World Café etiquette includes communicating to the participants that the focal point of discussion should rest on issues that matter, that is, the chosen topic. Active participation is encouraged by allowing the participants to speak freely from the mind and heart, listen attentively and scribble and link ideas as they emerge. Participants are also encouraged to listen for what is not being spoken along with what is being shared (World Café 2015:5).

The process requires rotations around tables at the end of the discussions per table, which normally lasts for about 15 to 20 minutes. The opportunity to move between tables facilitates active contribution of thoughts. The process contributes in disseminating participants' key ideas or themes to new tables, enable exchange of perspectives, and link the essence of revelations thereby enriching knowledge (World Cafe 2015:3). Powerful questions that matter allow the participants to drive their own discussions, emphasizing the notion that all are equal in the group and their contributions are valued equally (MacFarlane et al 2019: 281; World Cafe 2015:7).

It is important to inform the participants of the time allocated for conversation per table. The responsibilities of the table hosts is to remain at the tables and welcome the newcomers and highlight the main ideas and key findings of the previous round and most significantly ensuring that an open, clear and friendly atmosphere prevails. As the conversations progress the table host ensure that significant thoughts, ideas and connections of all the participants are written and drawn on the tablecloths or charts provided. This promotes cross-pollination of ideas and knowledge (Drais 2017:2; World Cafe 2015:7).

At the end of the process, after each group has rotated and responded to the questions, summary of key findings is provided by the table hosts of respective tables

(Drais 2017: 2). Harvesting refers to gathering of the wisdom that has been shared at a meeting or event occurs (World Café 2015:4). The participants reflect on the discussions and are able to connect ideas, themes and insights and they are able to see a bigger picture of the topic discussed. It is important to note that as Word Café event is flexible there are no firm rules on giving out reports on what has transpired during the discussions. Drais (2017:4) states that it depends on several factors, such as the number of questions asked, the significance of the discussion, and the time available for the session.

- **Closing phase**

During this phase the convener expresses appreciation to participants. The convener may consider sharing with the participants how perceptions and views discovered from the session will be used within the organization or initiative. It is paramount to categorize the comments from the session into themes of insights, observations, and questions for consideration to obtain a deeper understanding.

#### **2.4.10 World café and constructivism**

The constructivist approach used in World Café data collection method compels the participants to digest new information gained during robust conversations and to be more cognizant of the factors contributing to high failure rate in biological science (Shapira-Lischinsky 2014:2). According to Phillips, (1997) in Shapira-Lischinsky (2014:2), cognitive constructivism concede that individual learners construct ideas based on their personal experiences, and social constructivism amplify the construction process to include interaction with others as another means of making sense of new information. World Café conversations allow the participants' different perspectives based on their experiences on the matter under discussion, to somewhat change their viewpoints or develop a shared understanding on the matter (Fillies et al 2016:229; Van Wyngaarden 2018:524).

Thus, in World Café method, the contributions of both social and cognitive constructivism promote the acquisition of deeper meaning and understanding of the topic at hand (Powell & Kalina (2009) cited in Shapira-Lischinsky 2014:2). World Café was purposefully chosen for the study, to elicit collaborative engagement, sharing insights, deep reflections and action planning from different perspectives of student nurses (Broom et al 2013:255; Tener 2014:2). The constructivist perspective underpin the assumption that knowledge is gained through interaction with others (Adom, Yeboa & Ankra 2016:2; Kalpana 2014:2). In World Café, the meanings and themes that evolve during the dialogue provide the participants with clearer understanding of events and a unified wisdom to solve challenges (World Café 2015:4).

## **2.5 CONCLUSION**

The current chapter focused on literature on World Café as qualitative data collection method. The information on World Café was presented, from its inception to the guiding principles and its relevance to this study as a conversation tool to collect data. The next chapter focuses on the research design and research methods used in the study.

## **CHAPTER 3**

## **RESEARCH DESIGN AND METHODS**

### **3.1 INTRODUCTION**

This chapter discusses the research design and methods used in the study. The chapter begins with the presentation of the research design, which was a plan the researcher followed in order to obtain answers to the research questions and to identify strategies that would minimize bias during the research process (Polit & Beck 2012:58). The second section of the chapter presents a discussion of the research methods, namely the techniques used to structure the study, to gather and analyse relevant information to the research question in a systematic manner (Polit & Beck 2012:12).

### **3.2 RESEARCH PURPOSE AND OBJECTIVES**

As indicated in chapter 1, the purpose of this study was to explore and describe the student nurses' perspective of the causes of high failure rate in biological sciences and the appropriate measures to improve the success rate in biological sciences.

In order to accomplish the purpose of the study, the following objectives were formulated, namely to:

- Explore and describe the student nurses' views, feelings and beliefs regarding the causes of high failure rate in anatomy and physiology
- Explore and describe the student nurses' views, thoughts and beliefs regarding appropriate measures to improve the success rate in anatomy and physiology.

### **3.3 RESEARCH DESIGN**

The research design determines the methods to be used to identify sources of information such as participants, elements and units of analysis as well as data collection and analysis methods including the interpretation of results (Brink et al 2012:

96). A qualitative exploratory, descriptive and contextual research design was used to address the study objectives and to provide answers to the research questions.

### **3.3.1 Qualitative research**

Qualitative research is a systematic, subjective form of inquiry used by researchers to obtain information on human experience, perceptions, motivations, intentions and behavior. The goal of qualitative research is to develop a rich understanding of a phenomenon as it exists in the real world and as it is constructed by individuals in the context of that world (Grove, Gray & Burns 2015:20; Polit & Beck 2012:120). Qualitative research studies human behavior in everyday or natural setting, generate data that are primarily analyzed inductively to generate categories and explanations of experience. Qualitative research involves sustained interaction with the people being studied in their own language, and on their own understanding. It relies on methods that allow the researcher into the personal world of participants using varied strategies and methods such as interviews and observations (Brink 2009:123). The aim of using the qualitative approach to the study was to develop a rich understanding of the causes of high failure rate in biological sciences from the student nurses' perspective.

### **3.3.2 Exploratory research**

Researchers use exploratory research when little is known about the topic of interest or when the subject of the study is relatively new (Polit & Beck 2012:18). The researcher identified high failure rate in biological sciences among first and second year student nurses in spite of the available support given by the nursing school as a problem, but lacked information about the student nurses' perspective of the causes of high failure rate. The researcher conducted an extensive literature review pertaining to the study phenomenon and the world café to enhance exploration of the concepts related to the research topic.

### **3.3.3 Descriptive research**

Descriptive research is done mainly to describe a set of observations or the data collected in order for the researcher to gain a better understanding of a phenomenon as it exists in the real world and as it is constructed by individuals in the context of that world (Burns & Grove 2015:31; Polit & Beck 2012:226). It is also conducted to obtain an understanding of how people think of their behaviour as individuals or as part of a group. It does not draw conclusions from that data or determine cause and effect. In this study, the researcher organised the data obtained during the exploratory process to describe the causes of high failure in biological sciences from the student nurses' perspective.

### **3.3.4 Contextual research**

Botma, Greef, Mulaudzi and Wright (2010:88) refer to research contexts as settings. Brink et al (2012:59) define a research setting as a specific place or places where data are collected while Polit and Beck (2012:743) refer to the setting as physical location and conditions in which data collection takes place. According to Polit and Beck (2012:489), qualitative researchers collect their data in real-world, naturalistic settings. The setting for the study was a nursing education setting, at one of the three campuses of the Free State school of nursing, which trains nurses under R425 (General, Psychiatric and Community) and Midwife.

Contextual research was used to capture detailed information about how participants behaved and interacted during the world café conversations. Observational notes were taken, and audio recordings were done during the plenary sessions of the world café conversations. Using a lecture room, a conducive and hospitable atmosphere was created to ensure that participants are free to express and share their experiences and feelings, aligning with the first principle of World Cafe.

## **3.4 RESEARCH METHODS**

The research methods used in this study are described in terms of population, sample and sampling procedures, sample size, data collection method and instrument, data

collection process and data analysis methods. The components of the research methods are discussed in the paragraphs that follow.

### **3.4.1 Population**

According to Brink et al (2012:131) and Polit and Beck (2012:738), a population is the entire group of persons or objects that are of interest to the researcher and that are accessible. The same authors further explain that the target population is the total group of people who meet the pre-set criteria, while the accessible population comprise people who meet the designated criteria and are available for the study.

The target population in this study comprised of student nurses registered for the programme of education and training leading to registration as a Nurse (general, psychiatric and community) and Midwife (R425, 1985; paragraph (iii) as amended) at the selected campus of the School of Nursing in the Free State. In selecting the study participants, the researcher used an inclusion criteria, namely the specific characteristics or qualities that research participants should have in order to take part in the study. Polit and Beck (2012:274) explain that the inclusion criteria are a determinant of a person's suitability to membership of a particular sample population.

In order to be included in the study, the participants had to be:

- 1<sup>st</sup> and 2<sup>nd</sup> year male and female student nurses
- Studying at the selected campus of the school of nursing in the Free State Province, for a Diploma in Nursing (General, Psychiatry, Community) and Midwifery

Exclusion criteria refer to the specific characteristics that participants or population lack in order to be included in the study, as outlined in the study protocol (Polit & Beck 2012:274). The following students were excluded from participating in the study:

- 3<sup>rd</sup> and 4<sup>th</sup> year male and female student nurses, at the selected school of nursing school, registered for the same nursing programme (Diploma in Nursing (General, Psychiatry, Community) and Midwifery)



- 1<sup>st</sup> and 2<sup>nd</sup> year male and female student nurses studying at the selected school of nursing, but registered for other nursing programmes such as the Bridging course.

### **3.4.2 Sample and sampling procedure**

A sample is a subset of the population that is selected to represent the population (Brink et al 2012:217; Polit & Beck 2012:742). First and second year student nurses were recruited for the study because they had knowledge and information that the researcher wished to explore in order to answer the research question. Sampling is defined by Brink et al (2012:132) and Polit and Beck (2012:742) as the process of selecting a portion of the population from the researcher's group of interest to represent the target population.

Non-probability, purposive sampling was used to select a sample of information-rich participants (first and second year student nurses) for the study. In non-probability sampling, there is no guarantee that each participant has a chance of being included in the sample. According to Grove et al (2013:365) purposive sampling is also referred to as judgmental or selective sampling whereby researchers consciously select information-rich participants or cases that can assist them with the central focus or the purpose of the study. The same authors further explain that it is important that the researchers indicate the characteristics that they desire in participants and should provide reasons for the type of participants they select, to ensure that essential data is obtained for the study.

### **3.4.3 Sample size**

Polit and Beck (2012:742) define a sample size as the number of people who participate in a study. Polit and Beck (2012:275), are of the view that representative sample is needed to ensure that the collected data accurately reflects reality and can be generalized to the population. The sample size was not predetermined (Jafta 2013:10), the researcher followed the general recommendation for world café to utilize the largest sample possible. The notion is that the larger the sample, the more representation of the population is likely to occur (Polit & Beck 2012: 284).

#### **3.4.4 Data collection method and instrument**

Data collection refers to the methods used to gather pieces of information required to conduct the research. It entails precise and systemic gathering of information relevant to the research purpose or the specific objectives or questions (Motseu 2016:66; Polit & Beck 2012:725). The researcher's decision about the choice of the method to use for data collection is influenced by the research design (Botma et al 2010:204). Different methods that may be used for qualitative data collection include interviews (individual or group interviews), observations, textual or visual analysis (Botma et al 2010:204). World café for a focus group interviews were used were used to generate data. In the following paragraphs, the data collection process as it occurred is described.

- **World café**

The World Café brings all study participants together in one place, using a highly structured process of movement to a creative, flexible and coevolving networks of conversation (Jorgenson & Steier 2013: 393). According to Arivananthan (2015:1) World Café is an excellent tool that encourages participant interaction by facilitating productive dialogue between a group or groups of people around an issue that matters to the group as a whole. The relevance of world café to the study aims and objectives is its emphasis on participants' dialogue for sharing views, exploring and discussing issues of concern to them, confronting real life challenges and for making suggestions (Fallon & Cannaughton 2016). One of the advantages of using World Café was that the student nurses, rather than the researcher, were responsible for the conversations and recommendations for improving the success rate in biological science.

#### **3.4.5 Data collection process**

The researcher followed Drais's (2017:1) three (3) phases of conducting world cafes, namely the preparation phase, implementation phase and the closing phase. The phases as applied to the study are described in the paragraphs that follow.

- **The preparation Phase**

In keeping with the first principle of World Cafe of setting the context, the researcher organized a meeting with first and second year student nurses to invite them to the event. The purpose of the study, as well as the activities involved (world café in particular) were explained to the participants. The student nurses were made aware of the voluntary nature of their participation in the study, their right to refuse to participate in the study and their rights to confidentiality and anonymity. In addition, the participants were informed of their right to withdraw from the study at any point without explanation or consequences even after they had already signed a consent form (Polit & Beck 2012:158). The researcher made it clear that the Café was not to just a means of collecting information about causes of high failure rate in biological sciences rather it was aimed at providing them with the opportunity to contribute positively on how the performance in biological sciences can be improved (Bradbury 2015:215). Consent to participate in the study was sought from the student nurses, all of whom were 18 years and above (*Annexe G*). The researcher ensured that all the participants were given the necessary information regarding the dates, times and venues for the world café conversations.

The next step was to create a hospitable environment. Adequate lighting and ventilation were ensured, and the room was large enough to allow arrangement of tables that seat 4-6 people and also allow free movement of participants between the tables. On the day of the event, a welcoming atmosphere that displays a café ambiance was created (World Café 2015:3). The tables were covered with paper tablecloths, drinks, water, and snacks such as sweets, peanuts, and chips were put on the tables as shown in figure 3.1. The researcher provided marker pens and the table menu (focus group interview guide) (*Annexe H*).



Figure 3.1. The set-up of the venue for the World Café (Photograph taken by Mosebi 2018).

- **Implementation Phase**

After introducing herself to and welcoming the thirty (30) participants for the first session and twenty-eight (28) participants for the second session, the researcher explained the process of world café conversations as it is different from the conventional methods. The world café conversations were conducted in English, which is the official language of instruction at the school of nursing and the language that the student nurses preferred to use. Informed consent was obtained from each participant (*Annexe G*).

Participants were given the option of choosing the tables at which to seat. They identified a host at each table before the process began and the hosts were briefed on their responsibilities during the conversations. The responsibilities of the table host included managing the conversation at the table, sustaining the energy levels of the group, to remain at the table when the others move on, and to brief the arriving groups about the highlights from the earlier conversations. The table host was also required to provide an overview of key contributions from the table during the plenary sessions.

The participants were encouraged to write notes, put key ideas or draw everything emanating from their conversations on the paper tablecloths (flip charts), about their perspectives of the high failure rate in biological sciences and also the recommendations on how performance in biological science can be improved.

Each group went through 4 (four) rounds of conversations for approximately 25 minutes. After the initial round of conversation, group members switched tables and a table host remained at the table to briefly welcome people and fills them in on highlights of the previous discussion. Other members who moved to the next table served as travellers taking the ideas from one group and adding to them, developing insights through multiple conversations with a diverse number of people, and expanding the collective knowledge of the group. As group members moved in several rounds of conversations, ideas, questions and themes began to link and connect. After the fourth rounds of café conversations were completed, all groups joined in a plenary session for reflections on the topic and questions. All groups shared insights and discoveries, identified patterns and provided recommendations for improving the success rate in biological sciences among student nurses. Each session lasted for about 150 minutes.

The hosts of every table provided a brief summary of key points and insights from the conversations that had taken place. The host captured key findings on a separate flipchart. During plenary session, the researcher obtained an informed consent of the participants to the use of a tape recorder during reporting back after discussions. Polit and Beck (2012:317) mention that if the target behaviour is auditory, recordings can be used. A high quality audio- tape recorder with a built-in microphone was used. The tape recorder allowed the researcher to capture all the information without having to rely solely on writing. This ensured that a record of the interview was available and could later be transcribed for analysis. A gallery tour of all tablecloths from all the conversations was also taken for analysis.

- **Closing Phase**

The researcher thanked the participants for their inputs and recommendations made to improve the success rate in anatomy and physiology.

### **3.4.7 Data analysis**

Brink et al (2012:193) explain that data in qualitative research is non-numerical and it is usually in the form of written words, videotapes, audiotapes and photographs. The participants' responses during the plenary sessions were tape-recorded and the researcher took notes throughout the sessions.

The verbatim transcriptions of interview data from the audio-recordings, information on tablecloths (flipcharts) and notes made during the interviews provided a record of the raw data.

Thematic analysis of the world café data was guided by the principles as described by Braun and Clarke (2006; 2013) and the document analysis as discussed by Blakeman, Samuelson and McEvoy (2013) was applied. According to Braun and Clarke (2006), thematic analysis is a method used for identifying, analyzing, and reporting patterns or themes within the data and minimally organises and describes data set in rich and detailed manner. Braun and Clarke (2006; 2013) model of thematic analysis was used as a guiding framework for the analysis because it provided an approach that produced an insightful analysis that answered the research questions. In addition, this approach can be considered an essentialist or realist method, which reports on experiences, meanings and the reality of participants (Braun & Clarke 2006; 2013).

Clarke (2006) cited in Nowell, Norris, White, and Moules (2017:4) explain that, even though the thematic analysis is documented and presented as a linear, six-phased method, it is actually an iterative and reflective process that develops over time and involves a constant moving back and forward between phases as shown in figure 3.2.

### **Braun and Clarke's six-phase framework**

Phase 1: Become familiar with the data

Phase 2: Generate initial codes,

Phase 3: Search for themes,

Phase 4: Review themes,

Phase 5: Define themes

Phase 6: Write-up report

The process of thematic analysis followed the phases in Braun and Clarke (2006) as follows;

- Phase 1: Familiarizing yourself with your data

According to Brink et al (2012:193) it is essential that the researcher understand what is happening by becoming immersed in the data. The process of data analysis started with the sorting of paper sheets, listening to the audiotape and read all the data that had been transcribed. During the process of analysis the researcher carefully read and examined data to get a sense of the presented information until a clear picture of the data was formulated.

- Phase 2: Generating initial codes

Brink et al (2012:193) refer to coding as a symbol or abbreviation used to classify words or phrases to find patterns and produce explanations using inductive and deductive reasoning. This phase involves the initial production of codes from the data, a theorizing activity that requires the researchers to keep revisiting the data. Coding assists the researcher to break down and identify specific characteristics of the data. The researcher organized the data into codes by using words that the participants used.

- Phase 3: Searching for themes

According to Polit and Beck (2012:744) a theme is a recurring regularity emerging from an analysis of qualitative data. Nowell et al (2017: 8) describe a theme as an abstract entity that brings meaning and identity to a recurrent experience and its variant manifestations. The theme captures and unifies the nature or basis of the experience into a meaningful whole. The researcher developed themes by categorizing ideas and experiences, looked for deeper meanings in what the participants said and attach labels to index them as they relate to a theme.

- Phase 4: Reviewing themes

The researcher reviewed all the recorded information obtained during the data collection process. Themes and categories of ideas were assessed to verify whether they appear to form a coherent pattern. Clarke (2006) cited in Nowell et al (2017: 8) highlight that the validity of individual themes will be considered to determine whether the themes accurately reflect the meanings evident in the data set as a whole.

- Phase 5: Defining and naming themes

During this phase the researcher works with codes and categories to determine what aspect of the data each theme captures and identify what is of interest about them and why (Braun & Clarke, 2006 cited in Nowell et al(2017:8). The researcher analyzed each individual theme in detail, identified the story that each theme told while considering how each theme fit into the overall story about the entire data set in relation to the research questions.

- Phase 6: Producing the report

During this final phase the researcher consolidates data and presents a thick description of the process coding and analysis, the context, and the audit trail. The researcher reports on the rationale for theoretical, methodological, and analytical choices throughout the entire research.

The analysis of world café documents produced by participants (sheets of data collected from the tables; figure 3.3) followed the steps as suggested by Blakeman et al (2013), which included;

- A quick and rough sorting of the sheets of data to get a sense of the whole, while keeping the focus of the study in mind, i.e. high failure rate in biological sciences
- Second glance of sheets was done and broad categories were identified
- Each sheet was looked at separately, and through a process of grouping words and phrases together, themes and subthemes were established
- The results were compared to the raw data in order to ensure that the results were a true reflection of the raw data (De Chesnay 2015:185).



## Recommendations:

1. The college should appoint a lecturer who understands BNS and that is more about the subject.
2. The workload should be reduced / such a way that it will be possible in its prescribed period of time.
3. Since well BNS is a practical subject change overtime structures should teach learners.
4. Learners should be encouraged to make other people's experiences - be motivated to be positive towards.
5. Tutorial should be offered to who feel that they need them and willing to pay.
6. Lecturers should not depend on recommendations.
7. Learners should be encouraged to feel free to consult.
8. A guide should be provided in which learners can start preparing even practical term.

## POSSIBLE CAUSES OF HIGH FAILURE RATE IN BIOLOGICAL SCIENCE

1. Lack of understanding content
2. Too much content within limited time.
3. Some of the students is their first time doing biological studies in the Nursing Faculty. "Never did in High School"
4. Most of the terminology used are not familiar with.
5. CHOICE OF LECTURES THAT ARE facilitating the subject. they also lack of knowledge and understanding the subject itself.
6. Manner in which questions are asked in tests and exams.
7. Question ~~the~~ scope is misleading
8. Lack of participation by students during tutorials, making it difficult for the lecturers to identify if they are having a problem or NOT.

Figure 3.3. Sheets of data (paper table cloths).

The data was analysed by the researcher and co-coders, who followed the same steps independently.

### **3.5 MEASURES TO ENSURE TRUSTWORTHINESS**

Trustworthiness is a significant feature in qualitative research. According to Polit and Beck (2012:745) trustworthiness is defined as the degree of confidence qualitative a researcher has in their collected data. Trustworthiness is assessed using the criteria of credibility, transferability, dependability, confirmability and transferability (Polit and Beck 2008:539 cited in Brink et al (2012:172). The measures to ensure trustworthiness in this study are presented in the following paragraphs.

### **3.5.1 Credibility**

Credibility refers to the extent to which the research findings can be confidently linked to the perspectives of participants and the context of the study (Polit & Beck 2012: 585). In order to enhance credibility, the researcher performed member checking by reading back what was discussed with them to re-check that their words matched what they actually intended, and to ensure that the facts had not been misinterpreted since they were tape-recorded, sharing study findings with participants to verify accuracy, provide completeness and improve validity of findings during and after the interviews.

Bitsch (2005) cited in Anney (2014:276) explains that qualitative research data collection requires the researcher to engage herself or himself fully in the participants' world. The researcher is employed at the school under study therefore had an insight into the context of the study. The prolonged engagement enhances trust of the participants and provides a greater understanding of participants' culture and context (Onwuegbuzie & Leech (2007) cited in Anney 2014:276). In addition, the researcher made use of audit trail and during the world café plenary participants were asked questions that encouraged them to support their statements with examples.

### **3.5.2 Transferability**

Transferability is synonymous with generalizability of findings in quantitative studies. However, in qualitative studies, data can only be explained within the context in which it is derived (Polit & Beck 2012:595). The researcher provided thick description of the context in which the research was carried out, the setting, sample, sample size, sampling method, inclusion and exclusion criteria, data collection method and procedure, interview questions based on the research process. The information will enable the reader to assess whether the findings are transferable to their own setting.

### **3.5.3 Dependability**

Dependability is another criterion to establish the trustworthiness of a study (Brink et al 2012:119). Tobin and Begley (2004) cited in Nowell et al (2017:3) state that to achieve dependability, researchers need to ensure that the research process is logical, traceable, and clearly documented. It is concerned with repeatability of findings in spite of time and conditions while using the same methods (Polit & Beck 2012: 585). Dependability will be ascertained by the use of an audit trail.

### **3.5.4 Confirmability**

Confirmability is the extent to which findings can be linked to the initial data and eventually to the sources (Phillips et al 2012:9). Confirmability ensures that the findings, conclusions and recommendations are supported by the data and that there is consistency between the researcher's interpretation and the actual evidence. Thus the researcher provided thick description of all the research processes by explaining how the data was collected, context of the study to production of the final report. Koch (2006); Wallendorf and Belk (1989) cited in Anney (2014: 278) report that confirmability also can be established using a reflexive journal. The researcher kept a reflexive journal of all the information obtained during the beginning of the study, including personal reflections in relation to the study. The reflective journal helped the researcher to evaluate the impact of her own background, perceptions and interests on the research process (Krefting 1991 cited in Anney 2014:278) The researcher only used data from audio tapes, transcripts, field notes, flip charts documents from café meetings in the analysis and did not add any other information not provided by the participants. The tape recordings and field notes will be kept for at least 5 years after completion of the study.

## **3.6 ETHICAL CONSIDERATIONS**

Brink et al (2012: 32) state that the researcher has the responsibility of ensuring that research is conducted in an ethical manner from the conceptualization and planning phases, through implementation phase to the dissemination phase. In the paragraphs

that follow, ethics pertinent to the current study are presented under the headings respondents, institutions and the integrity of the researcher:

### **3.6.1 The respondents: respect for persons**

Beckmann (2017:7) states that the principle of respect for persons proposes and supports the view that people or study participants should be self-determined (self-governance) and should be given a choice to decide on issues that pertain to them. The principle seeks to defend and protect vulnerable persons as much as possible. The principle of respect for persons means that a person must choose voluntarily whether to participate in research based on the accurate (truth) flow of information given to participants regarding the risk and benefit of research. In the paragraphs that follow, the basic rights of participants in research as they relate to the principle of respect for persons are presented rights include right to full disclosure about the research, right to privacy, anonymity and confidentiality, the and the right to be protected from harm.

- **The right to full disclosure and informed consent**

Research participants need to be given information (full disclosure) before they give permission to participate in the study. They have to indicate their willingness and affirm their agreement to participate in the study (Welman et al 2005 in Chauke 2014:104). According to Holloway and Wheeler (2010:55), LoBiondo-Wood and Haber (2010:252) and Polit and Beck (2012:158), full disclosure is a gateway for research participants to make informed decisions of whether to participate or not in the study. Furthermore, the participants must have a clear understanding on what the study entails and the expected duration of their involvement in the study. To ensure that the participants were afforded the opportunity to make an informed choice, the researcher held a meeting with all the first and second year student nurses of the campus under study and explanation and request for them to participate in the study was discussed. Those that had interest were given the information leaflet to go through to ensure understanding before data collection dates and appointment were set. Attached to the information leaflet was the consent form, which was then signed by the participants willing to participate in the study.

The researcher explained the research purpose and process to each participant. The participants were made aware of their right to participate in the study without being coerced, and the right to withdraw from the study at any given point without explanation or consequences even after they had already signed a consent form (Polit & Beck 2012:158). They were also informed about the voluntary nature of their participation and the option to refuse to participate in the study (Polit & Beck 2012:158). Before participants signed the consent form, which was English (Annexure H), the researcher ensured that participants understood the information before making them sign the informed consent.

- **Anonymity and confidentiality**

Anonymity means that the researcher should ensure that no participant in the study is to be identified from any of the responses that they have given while confidentiality means that the information that the researcher obtains about and from the research participants should not be divulged to other people without their permission (Brink et al 2012:37; Polit & Beck 2012:162). The researcher took the following measures to ensure that the participants' rights to confidentiality and anonymity were upheld;

- i. The participants were assured that the information given by them would be treated in strict confidence and that it would be used for the research purpose only.
- ii. All the data collected was kept confidential, and protected from unauthorized access
- iii. The researcher made a commitment that she would protect the identities of the participants and that of the participating school of nursing.
- iv. Participants signed a confidential binding agreement (*Annexure I*), which stated that they agreed that no information would be shared outside the confines of the group for the sake of confidentiality.
- v. Names of the participants were not written in study records and data was by no means associated with participants in the report.

- **Beneficence and non-maleficence**

This principle refers to the fact that the researcher is obligated to capitalise on maximum benefits and lessen harm or exploitation of research participants. If there is any particular foreseeable harm it must be minimum and explained to the participants. More often harm can take any form, be it physical, psychological, emotional, social and legal (Polit & Beck 2012:171).

There was no predicted physical harm. However, the researcher anticipated that there may be psychological or emotional discomfort associated with feelings of embarrassment or pain for students who failed or were struggling with biological science. Participants were treated with respect and dignity and no discomfort or distress was observed during the study.

- **Justice**

Justice is a principle, which states that all participants should be treated alike, and equitably (Grove et al 2013:172). Fair treatment denotes that research participants are selected fairly without social, cultural or sexual biases and risks or benefits fairly distributed based on the parameters of the study. In order to uphold this principle, the researcher used the pre-determined eligibility criteria stated in 3.4.1 to select the study participants.

### **3.6.2 Institutions**

Before the commencement of the study, the higher degrees committee of the Department of Health Studies at the University of South Africa granted the researcher ethical clearance certificate number HSHDC/727/2017 (*Annexure A*). Written permission to conduct the study was granted by the Free State Department of Health and the management of the Free State School of Nursing (*Annexes C, E & F*).

### **3.6.3 Scientific integrity**

All the research procedures and processes were undertaken accordingly and documented. There was no manipulation of research methods to suit the researcher's

perspectives. Furthermore, acknowledgement of sources used was carried out appropriately.

### **3.7 CONCLUSION**

In this chapter, the researcher provided a detailed description of the research design and methods that were applied to the study. In chapter 4, the research findings, procedures applied during data analysis and interpretation are presented.

## **CHAPTER 4**



## **ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS**

### **4.1 INTRODUCTION**

In this chapter, the analysis, presentation and the description of the study findings are presented. The data collection and analyses presented in this chapter occurred according to the research methods described in Chapter 3. The chapter begins with the discussion of the research data management and presentation, followed by a brief summary of data analysis and the study findings.

### **4.2 DATA MANAGEMENT AND PRESENTATION**

Research data management refers to the care and maintenance of the data that is produced during the course of the research. It is an integral part of the research process that helps to ensure that the collected data is properly organized, stored, preserved and shared (Whyte & Tedds 2011). The verbatim transcriptions of interview data from the audio-recordings, participants' created documents (writings on the paper table cloths), notes made during the world café and the researcher's reflection on the data after the interviews provided a record of the raw data. The data collected were stored electronically in separate protected locations as MS word files and audio recordings to create backup. The MS word files were password protected.

### **4.3 DATA ANALYSIS**

Thematic analysis of world café data was done simultaneously with data collection by the participants and the researcher. As indicated in chapter 3, the researcher followed the model of thematic analysis of Braun and Clarke (2006, 2013) as a guiding framework for the analysis to produce an insightful data that answered the research questions. For the participants' created documents (data written on paper table cloths and other documents), the researcher applied the method of document analysis as described by Blakeman et al (2013).

### **4.4 STUDY FINDINGS**

The researcher conducted the world café conversations using the interview guide. The participants had to respond to the two questions, namely;

- From your perspective, what are the causes of the high failure rate in anatomy and physiology?
- What recommendations do you make to improve the pass rate in and physiology?

In the following paragraphs, the study findings are presented, starting with the description of the sample, followed by themes that emerged from the data analysis.

#### **4.4.1 Sample description**

In compliance with the inclusion criteria described in 3.4.1, the sample comprised fifty eight (58) first and second year student nurses registered at the selected campus of the school of nursing in the Free State Province, for a Diploma in Nursing (General, Psychiatry, Community) and Midwifery. There were ten (10) males and forty eight (48) females in the sample.

Two sessions of world café conversations were held, with (30) participants for the first session (5 tables, each with 6 participants) and twenty eight (28) participants (5 tables, two with 5 participants each, and 3 tables with 6 participants each) for the second session. Each group went through 4 (four) rounds of conversations for approximately 25 minutes. The duration of the sessions was 150 minutes for the first session and 120 minutes for the second session.

#### **4.4.2 Themes**

From the thematic and document analyses of data, two (2) themes emerged. These themes were identified as the rich and detailed account of student nurses' perspective of the causes of high failure rate in biological sciences as well as the measures needed to improve the pass rate.

The first theme that emerged was *ineffective teaching learning process*. Within the theme three categories *content overload, environment not conducive to teaching and learning and unfair assessment practices* emerged and the subcategories were as shown in Table 4.1.

**TABLE 4.1 THEME 1**

Theme 1	Categories	Sub-categories
Ineffective teaching learning process	Content overload	i. The content for the subject is too much for the allocated teaching time
	Environment not conducive to teaching and learning	ii. Inadequate educational resources iii. Inadequate utilisation of available resource iv. Utilisation of the same uninteresting and ineffective teaching methods v. Lecturers incompetent, lack interest and passion for the subject
	Unfair assessment practices	vi. Assessment not based on learning objectives vii. Assessment scope misleading

**i. The content for the subject is too much for the allocated teaching time**

The findings revealed that most student nurses mentioned that biological science content was packed with a lot of information which is given within a short space of time. The sample responses include;

“The workload is too much and the time is limited for us to study the whole semester content.”

“There is too much to consume in a short space of time”

The study finding is consistent with previous studies. Kaylor (2014:53) found that student nurses are challenged by content-laden curricula and that students are expected to learn large content in a short period of time. Monisi (2018) conducted a quantitative study on the causes of high failure rate in biological sciences among student nurses in the Limpopo province of South Africa. The same author found similar finding that the time allocated to teaching the subject is not enough for the large amount of content.

According to Bonsaksen, Ellingham and Carstensen (2018:2) the workload is measured as the number of contact hours plus the time spent on self-study. The same authors explain that contact hours refer to classroom teaching and attendance whilst time spent on self-study is related to assignments, group work or studying for assessment. The implication for student nurses is that it is their responsibility to attend classes and put aside time to study as well as participate in class assignments and group work.

With regard to content overload, the participants recommended that the workload of biological science be reduced by decreasing practical hours and increasing the time allocated for theory. The participants' perception was that these will facilitate covering the content and yielding positive outcomes. Sample responses include;

“We recommend that practical hours for 1<sup>st</sup> and 2<sup>nd</sup> year students should be decreased and increase class hours.”

“There should be extension of the time frame or reduction of content.”

“The workload should be reduced or divided in such a way that it will be possible to cover it in the prescribed period of time”

The same recommendation was made in previous studies. Tom, Coetzee and Heyns (2014:102) conducted an appreciative inquiry into the factors influencing academic performance among students in the Eastern province of South Africa. During the dream phase of the same appreciative inquiry, the vision of students involved re-arrangement of biological sciences content to make it manageable by reducing its workload.

Karabulut, Aktaş Alemdar (2014:9-10) express a different view from the student nurses' perspectives. The same authors emphasize that acquisition of theoretical knowledge is as important as clinical practice. The authors further explain that clinical practice is the most critical part of professional nursing education and that clinical exposure facilitates transfer of acquired knowledge into practice. In addition, clinical practice assists the student nurses to obtain professional skills, critical thinking and knowledge that will be necessary for them to learn throughout their lives, and helps them to be able to make independent nursing decisions (Karabulut et al 2014:10).

The participants further recommended remedial classes and support for poorly performing students or those that did not take biology or life science in high school. In their study on developing tools to identify students at risk of failure in anatomy and physiology, Gultice et al (2015:108) made a similar recommendation that support services should be integrated into the curriculum to address the specific needs of the student population, taking into consideration students at risk of failure. Gultice et al (2015:108) give the rationale for the recommendation of support that, because anatomy and physiology are content-driven, they require from the students the ability to read, write, and to possess mathematical skills for eventual success and independent learning in the subject. Different support programmes used for individual or a group of students to promote interest or facilitate student nurses' performance in anatomy and physiology were found in literature. Scott, Louw and Kahn (2017:48) explored the use of supplementary anatomy workshops for improving undergraduate student performance. In the same study, the authors assigned classes to control or treatment groups (received instruction designed to help students develop a deeper understanding of anatomy vocabulary related to brain structures by making connections to these words in everyday life as well as to their understanding of Spanish). Scott et al (2017:47) found that the statistically significant increases in learning for both groups suggested the activity, problem, and project-based curriculum had the potential to be an effective type of instruction, especially for bilingual learners.

In South Africa, Tshotsho, Mumbembe and Cekiso (2015:597) found that the establishment of teaching and learning centres where students for whom English was the second language were taught language skills, such as grammar, vocabulary and pronunciation was useful.

## **ii. Inadequate educational resources**

According to the participants, the environment was not conducive to learning because of inadequate appropriate learning resources for anatomy and physiology, non-utilisation of available resources, utilisation of the same ineffective teaching strategies

and incompetent lecturers. The participants indicated that there were no models on which to practice because the ones in use were broken. One of the sample responses from world café conversations was *“There is a lack of visual aids to help visualizing the content”*

This finding is consistent with previous studies on the causes of high failure rate among student nurses. Iwu and Xesha (2011:87) identified inadequate infrastructure, lack of relevant study material as reasons for high failure rate in biological sciences among university students in South Africa. The same authors state that for education to be effective, students need to have access to its basic tools to study such as textbooks and all instructional materials. However, Iwu and Xesha (2011) are mindful of the fact that various factors affecting poor performance may affect educational institutions differently as each are faced with their unique challenges and their respective operational environments. Merkle (2015:73) corroborate this view by stating that appropriate learning resources are important factors in student nurse success.

The study participants in this study recommended additional educational resources that could enhance their understanding of biological science, like the use of manikins. According to the participants’ perspectives, these educational resources could facilitate understanding of the concepts. The students who participated in the appreciative inquiry by Tom et al (2014) into the factors influencing academic performance in biological sciences wished for a variety of educational resources (visual aids, computer laboratory, and library facilities) to be available to promote the application of biological sciences.

### **iii. Inadequate utilisation of the available resources**

The participants mentioned that some of the available educational resources such as the computer laboratory are not utilized, and they have to resort using their own devices which require which them to buy data for themselves. According to the study participants, the library service though present, does not have enough books and sometimes the librarian is not available. Sample response

“Resources are not being used to make learning simpler, for example the computer lab”

The participants recommended that computer laboratory be opened and utilized. The participants also recommended additional visual aids and improved library services.

The participants expressed their belief, that because biological science is a practical subject, they would like to have models such as manikins on which to practice.

#### **iv. Utilisation of the same uninteresting and ineffective teaching methods**

The findings show that all students stated that the lecturers use the same teaching learning methods, namely group discussion and reading from the prescribed books. The sample responses included;

“The lecturer reads from the book, something a student can do at his or her own”

“There are no elaborations or explanations after reading the book and group discussions”

“Lecturers rely on group presentations”

“Students have to present the units, with no guidelines on how to from the lecturer so they just end up reading”

The student nurses who took part in the current study indicated that the lecturers read from the books and relied on group discussions without any guidelines or explanation after reading from the book. Mhlongo (2018) reported similar findings of nurse educators not involving students fully in the teaching learning process. In agreement with study on factors that hinder the academic performance of nursing students in biological sciences by Pinehas, Mulenga and Amadihila (2017), the student nurses in the current study indicated that the teaching strategies used by the lecturers for anatomy and physiology were ineffective. Jeffreys (2015:428) also identified teaching strategies as one of the academic factors that influence academic outcomes.

Teaching strategies are methods of instruction used by the teacher to help students achieve learning objectives (Gill & Kusum 2017:6695). Brown Bowmar, White and Power (2017:491) point out that there are many strategies to assist students and increase their engagement in learning because active participation is key to effective teaching and learning. The same authors maintain that active learning motivates students to engage in the learning process in a meaningful way. According to Miller and Metz (2014:246), an active learning instructional style encourages students to take responsibility for their own learning thereby increasing their desire to learn.

With regard to the use of ineffective teaching strategies, the participants recommended that lecturers should utilise a variety of teaching methods and to facilitate biological science in a more visual manner, by including more laboratory experiences and making use of visual aids like manikins. There is adequate literature that supports the use of different methods for teaching anatomy and physiology. Levey (2009:46) point out that educators of anatomy and physiology for nursing students need to use a wide variety of teaching strategies, especially kinaesthetic, in order to better engage the students in their learning. The same author suggests virtual learning environment using blackboard, study group peers, online module resources, lecture PowerPoint's, learning enrichment activities, discussion rooms, projects, multiple review sessions, homework, laboratory, optional help-sessions and assignments case studies. Çolak (2015:649) argue that in solving the problems encountered in anatomy education, the use of online media along with face-to-face learning enables the students to have access to the materials at will, to plan and steer their own learning, to evaluate themselves and to increase the student-student and student-teacher communication through forums. Sharma (2017: 4) is of the view that nurse educators have a responsibility to ensure relevance of selection of new approaches for using technology as a teaching tool, use strategies for reaching unmotivated learners and the ability to use Project-Based Learning Strategies in inclusive settings like laboratories, to have strategies to manage the classroom to increase instruction time and be able to empower students to think critically and be creative.

#### **v Lecturers incompetent, lack interest and passion for the subject**

Some nursing students indicated that there were characteristics of their nurse educators that were impacting negatively on their performance in biological science. They described their nurse educators as incompetent, with lack of interest and passion for the subject. Other student nurses indicated that some of the lecturers verbalized their lack of interest in the subject to the students. Sample responses include;

“The lecturer comes unprepared to the classroom, reads from the book, something a student can do at his or her own”



During presentations there is no elaboration, we read everything directly from the book with little to no understanding

“There are no elaborations or explanations after reading the book and group discussions”

“Students have to present the units, with no guidelines on how to from the lecturer so they just end up reading”

“The lecturers don’t show or present practical methods to impact knowledge”

Moynihan, Paakkari, Välimaa, Jourdan, and Mc Namara (2015:2) define competencies as a combination of attributes such as knowledge, skills and attitudes which enable an individual to perform a set of tasks to an appropriate standard. Competencies offer a barometer for defining what is required of the profession and contribute to consolidating the discipline (Moynihan et al 2015:2). It is imperative that nurse educators are equipped with professional competencies to be able to impart knowledge and skills required by student nurses. Competency forms an integral part of nursing education and competency development should therefore be enforced. According to SANC (2014:2) one of the core competencies of nurse educator is to facilitate learning. The specific competencies related to the role of nurse educators include showing enthusiasm for teaching, learning and nursing, inspiring and motivating students and also using personal attributes such as caring, confidence, patience, integrity and flexibility to facilitate learning.

Similar findings of incompetent lecturers who lack interest and passion for anatomy and physiology were reported in previous studies. In the study conducted by Iwu and Xesha (2011: 88) on factors affecting academic performance among university students, poorly trained teachers were found to be one of reasons for the poor students’ performance.

The recommendations made by the participants is that biological science should be allocated to nurse educators, who are passionate about teaching anatomy and physiology, who specialize in the subject or in-service training should be given to the current ones

#### **vi. Assessment not based on learning objectives**

According to the findings of the study, the participants mentioned that the assessment practices used in the teaching of anatomy and physiology were unfair in that

assessment was not based on learning objectives and that the given scope for tests was misleading. The finding was illustrated by the following sample responses

“The manner in which questions are asked in tests and exams are not according to the guidelines given”

“Tests are not based on learning objectives”

According to Brown et al (2015:7), an assessment that challenges the learning of the student in unfamiliar ways (not based on learning outcomes in this study) affects the students’ attitude negatively.

**vii. Assessment scope misleading**

The participants indicated that the guidelines or scope for the testes are misleading. The finding was apparent in the sample response;

“Scope must be on point and not misleading, either is given or not”

**THEME 2**

The second theme that emerged was *student related causes of high failure rate*. Within the theme two categories *difficulty in understanding the subject, and lack of commitment*. The subcategories were as shown in Table 4.2.

**TABLE 4.2 THEME 2**

THEME 2	CATEGORIES	SUB-CATEGORIES
Student related causes of high failure rate	Difficulty in understanding the subject	viii. Lack of background knowledge of the subject
	Lack of motivation	ix. Negative attitudes towards the subject x. Lack of commitment

**viii Lack of background knowledge of the subject**

The findings show that some of the students perceived biological science as a difficult subject to understand. The student nurses attributed the difficulty in understanding the subject to the lack of background knowledge of the subject (first time it is done in nursing). The students found it difficult to understand the subject because of difficult and unfamiliar terms used in anatomy and physiology. This finding was apparent in the sample following responses.

“Some of the students is their first time doing biological science studies in the nursing, they never did the subjects in high school”

“Some students come from commercial subjects at school so they are not familiar with even simple life science terms and they are expected to present something/content they are not familiar with”

According to Jeffreys (2015:425), background or prior knowledge is one of the student profile characteristics that has an influence on students' academic outcomes. Karabulut et al (2014:10) corroborate this view by stating that background knowledge facilitates students' comprehension of the subject and thus improves academic performance of students' critical thinking. In the context of the study, especially for first year student nurses, subjects done in matric serve as prior knowledge which becomes an anchor on which to build new knowledge of anatomy and physiology. Monisi (2018) conducted a quantitative study on the causes of high failure among nursing students and found the similar finding that learning anatomy and physiology is hard. The same author identified lack of background knowledge as a contributory factor to high failure in anatomy and physiology. McVicar, Andrew and Kemble (2015:508) found that many nursing students struggled with, and failed bioscience because of poor science backgrounds. Gultice et al (2015:109) found a connection between high school achievement in science and success in nursing courses. Students who failed or withdrew from Anatomy and Physiology I or Fundamentals of Biology I reported significantly lower averages in high school chemistry (Gultice et al 2015:109).

Friedel et al (2016:204) adds that one factor that creates difficulty in bioscience learning is that nursing students in the tertiary sector have a wide range of different educational backgrounds and life experiences. Craft, Hudson, Plenderieth, Wirihana and Gordon (2013:1402) conducted a study on the perceptions and anxiety of commencing nursing students and found that secondary school science was

significantly advantageous for bioscience and understanding what bioscience entails. In Ireland, McKee (2017:251) found that poor previous theoretical biological science significantly influenced bio-science examination results. The same author adds that if appropriate strategies for dealing with the problem were not introduced both within the course and prior to entry, the problem of high failure rate in anatomy and physiology would remain.

Because the student nurses who participated in the study believe that background knowledge in biology or life science has a positive effect on the performance in biological sciences, they recommended that one of the admission criteria for the R425 nursing program leading to registration as a nurse (general, psychiatry, community health) and midwife should include background in biology or life science subject. At the school of nursing where the study was conducted, life sciences is not a mandatory selection requirement. However, preference is given to candidates who have done life sciences, mathematics, and physical science (with academic point score of 24 and 27 for students who obtained matriculation certificate before 2008 and later respectively), hence the recommendation.

Mthimunye and Daniels (2016:2) propose that students with less satisfactory grades in grade 12 science subjects may be considered for the extended nursing program, or if admitted to the mainstream nursing program, they should be monitored closely and be provided with the needed academic support. The same authors suggest that the appropriate time to identify student at risk of failure or poor progression is before registration for the course or early in the term, in order to receive support before the first examination is taken. Gultice et al (2015:112) developed a multifaceted model that could lead to appropriate remedy before a student registers for anatomy and physiology courses. It is reported that the model had a 91% success rate in predicting successful completion of the course.

## **ix Negative attitudes towards the subject**

According to the findings, some students lack motivation which results in the development of negative attitudes towards biological science subject and lack of commitment.

“There are some students who have a negative attitude towards the subject”

Brown, White, Bowmar and Power (2015:7) state that attitude can be summarized as being positive or negative. It is therefore logical to assume that positive attitude toward a subject may contribute to both academic engagement and success whereas negative attitude may contribute to less engagement and thus poor academic performance. Negative attitudes appear to be brought about by ineffective teaching strategies, negative attitudes of nurse educators towards the teaching of anatomy and physiology, lack of resources and some individual factors. In addition, some of the students indicated that they become demotivated because they were being told that by the lecturers and senior students that it is difficult and hard to pass anatomy and physiology.

Levett-Jones, Andersen, Reid-Searl, Guinea, McAllister, Lapkin, Palmer and Niddrie (2015) cited in Brown et al (2015:7) indicate that teaching strategies that improve the attitudes of some learners, especially when their learning involves hands-on experiences, has led to recommendations that simulation be used to small groups of learners studying health sciences.

With regard to the negative attitudes towards anatomy and physiology, the participants recommended that the student nurses together with lecturers should change their attitude towards biological science. The participants felt that senior students and other lecturers must refrain from instilling the idea that biological science subject is difficult to pass. The student nurses have to be positive, study hard and dedicate more time into their studies

#### **x      Lack of commitment**

Participants felt that there are students who are less committed in their work. The possible reason is demotivation which results in student nurses becoming reluctant to put effort to study biological science. Sample responses include;

“Student must show more commitment to the subject”

“Students must study in advance and consult if encountering any problems regarding understanding the content”

“There are some students who are lazy to study.”

“Time and effort students put in biological sciences is minimal.”

“We are studying to pass, not to understand the subject or content”

Strydom, Mentz and Kuh (2010: 260) cited in Viljoen (2015: 31) describe academic commitment as students devoting their time to educationally purposeful activities. Vogel (2016: 11) is of the view that self-regulatory model of academic commitment pronounce having goals that are personally relevant and have an influence on achievement because they are perceived to be personally meaningful. Biological science is a requirement for the completion of the participants' studies, it should therefore carry personal meaning to them. Vogel (2016:11) further indicates that students who experience lower levels of self-efficacy and less personal meanings have a high likelihood to put less effort and time in their studies which will affect their academic commitment and eventually their achievement.

Brown et al (2015:7) point out that the students' commitment can be affected negatively if there is a disproportionate relation between the degree of perceived effort required to pass an assessment and the credit received for passing it. The same author mention that demotivation can also affect commitment.

Kusurkar, Ten Cate, Vos, Westers, and Croiset, (2013) cited in Bonsaksen et al (2018:2) mention that higher level of actual study efforts, that is, putting more time on studying, is reasonably linked with stronger motivation and with better academic performance. Higher education institutions are perceived to have a lot of work, and it is therefore imperative that students devote their time to both self-study outside the classroom and class attendance.

The participants acknowledged the fact that other reason for poor performance and high failure rate in biological science stem from themselves as students, by stating that;

“We do not give our books time”

“Time and effort students put in biological sciences is minimal”

Time management represents one of the most conventional subject in the realm of teaching and learning and has a positive impact on academic performance. Time management is generally described as activities that imply an effective use of time that is considered to facilitate productivity and reduce strain. The processes of

managing time effectively includes setting goals, making plans, organizing activities and continuously monitoring the progress made and making changes where it is necessary.

Nadinloyia, Hajloob, Garamaleki and Sadeghi (2013:135) highlight that the about 73% of students start learning or actually learn with less than one week before the examination period. Due to the short period available to study, the volume of academic content seem to be high and students become overwhelmed and fail to perform according to their associated intellectual abilities (Nadinloyia et al 2013:135). While education institutions have a responsibility to offer high quality education by ensuring that the educational resources, such as educators or facilitators are available and have the necessary skills and competencies required to perform their functions, accountability for student success involve collaboration between student and the teacher (Merkley, 2015:73). In agreement with Bonsaksen et al (2018:2) regarding the fact that in higher education the focus has shifted from the acquisition of knowledge to learning objectives and skills, some of the students stated *"We are studying to pass, not to understand the subject or content"*

According to Bonsaksen et al (2018:2) there are factors found to be influencing time to study and researchers have identified that curriculum characteristics affect the amount of time students devote to study. Such factors include difficulty of the scientific area, field of study, number of assessments and different supervised learning environments are thought to be related with the time devoted to self-study. It is the students' level of commitment and motivation to his or her studies that will determine the effort particularly time allocated for self-study in order for him or her to achieve the learning outcomes.

Recommendations brought up by participants suggested that student nurses should put time and effort in biological science, and consult on regular basis where they do not understand.

#### **4.5 OVERVIEW OF RESEARCH FINDINGS**

The findings on the perspectives of the student nurses with regard to high failure rate in biological science were taken into consideration and analysed according to the

themes that emerged during data analysis. The participants felt that the curriculum related matters, such as content overload, formative and summative assessment, educational resources; nurse educators including students have a huge impact on the performance of biological science. Emphasis was put on the lack of passion for the subject by the nurse educator, lack of sufficient knowledge on the content and lack of competency to teach biological science.

The participants suggested that the workload of biological science be reduced or reduce practical hours and extend theoretical hours to cover the content. They highlighted the need for remedial classes for struggling students. The participants are of the view that during selection of prospective students, preference should be given to those who have biology or life science background because according to them they perform better than those who do not have the background at all.

The findings suggest that provision of adequate educational resources that will enhance teaching and learning, modified teaching strategies that will facilitate acquisition and retention of knowledge, change of attitudes from both nurse educators and students could improve performance in biological science. The findings will give direction to management to allocate nurse educators that have zeal and an appeal for biological science. Mentoring and continuous professional development should be implemented as a matter of urgency.

#### **4.6 CONCLUSION**

This chapter presented the analysis, presentation and the description of the study findings. The findings were supported by researched studies for conclusions reached in this chapter to confirm the identified themes, categories and subcategories for this study with regard to the student nurses' perspectives of high failure rate in biological science at a nursing education institution in Free State Province.

Chapter 5 concludes the study, by summarizing the research findings, conclusions, recommendations and limitations of the study



## **CHAPTER 5**

### **RESEARCH FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY**

#### **5.1 INTRODUCTION**

This chapter summarises the findings, presents the conclusions and limitations of the study, and makes recommendations for nursing education and further research. The purpose of this study was to explore and describe the student nurses' perspective of the causes of high failure rate in biological sciences and the appropriate measures to improve the success rate in biological sciences. To achieve the purpose, the objectives of the study were to:

- Explore and describe the student nurses' views, feelings and beliefs regarding the causes of high failure rate in anatomy and physiology
- Explore and describe the student nurses' views, thoughts and beliefs regarding appropriate measures to improve the success rate in anatomy and physiology.

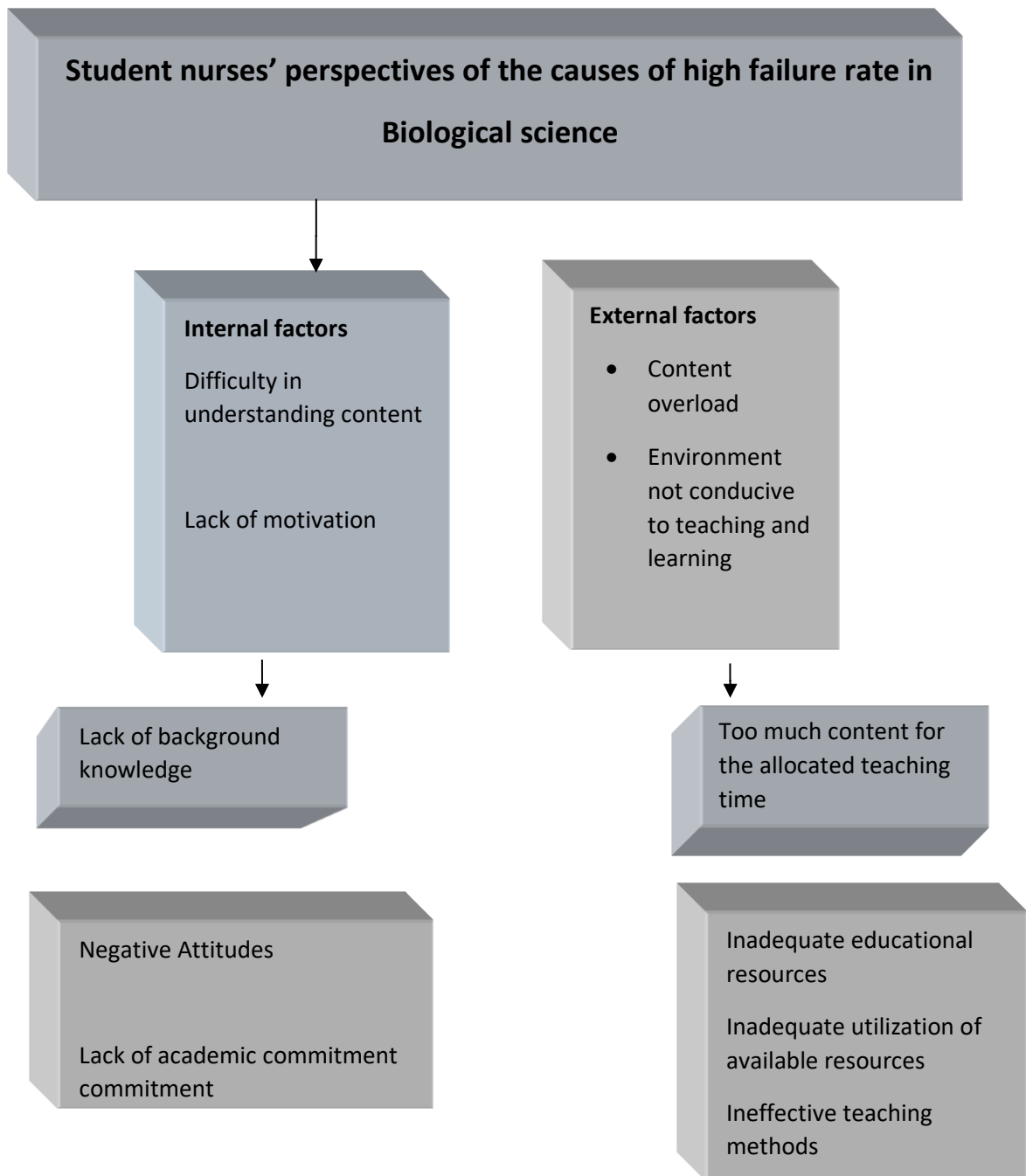
#### **5.2 RESEARCH DESIGN AND METHODS**

A qualitative exploratory, descriptive and contextual research design was used on a purposive sample of fifty-eight (58) student nurses. The sample comprised 1<sup>st</sup> and 2<sup>nd</sup> year student nurses registered for the programme of education and training leading to registration as a nurse (general, psychiatric and community) and Midwife (R425, 1985; paragraph (iii) as amended) at the selected campus of the School of Nursing in the Free State. In the sample, there were 10 males and 48 females between the ages 18 to 47 years. World café was used as a data collection method using an interview as a data collection instrument. The collected data was analysed following the methods described in chapter 4.

### **5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS**

The two themes that emerged from data analysis were ineffective teaching learning process and student related causes of high failure rate in anatomy and physiology. The themes were identified as the rich and detailed account of student nurses' perspective of the causes of high failure rate in biological sciences as well as the measures needed to improve the pass rate. The causes of high failure rate in anatomy and physiology can be regarded as external and internal factors.

External factors involved issues in the teaching learning process, namely the content of anatomy and physiology, inadequate educational resources, unfair assessment practices, nurse educators' competencies and attitudes. Internal factors included the negative student nurses' attitude towards the subject and lack of academic commitment. A summary of the student nurses' perspective of the causes of high failure in biological sciences is shown in figure 5.1



**Figure 5.1: Schematic presentation of the causes of high failure rate in biological sciences from the student nurses perspective.**

According to the findings of the study, many student nurses experience difficulties in learning and understanding biological sciences. In the paragraphs that follow, the causes of high failure rate in biological sciences (from the student nurses' perspective) and the recommendations made by students to improve the pass rate are presented.

### **5.3.1 Internal factors**

As indicated in 5.3, internal factors are students-related and they include difficulty in understanding the content and lack of motivation.

#### **Difficulty in understanding the content**

The student nurses perceived biological science as a difficult subject to understand and they attributed the difficulty in understanding the subject to the lack of background knowledge of the subject (first time it is done in nursing). The students found it difficult to understand the subject because of difficult and unfamiliar terms used in anatomy and physiology. Similar findings were reported in a variety of studies. McVicar et al (2015:508), Monisi (2018) and McKee (2017:251) found that many nursing students struggled with, and failed bioscience because of poor science backgrounds. Karabulut et al (2014:10) and Jeffreys (2015:425) agree that background or prior knowledge is one of the student profile characteristics that facilitates students' comprehension of the subject, improves academic performance of students' critical thinking. In the context of the study, especially for first year student nurses, subjects done in matric serve as prior knowledge which becomes an anchor on which to build new knowledge of anatomy and physiology. Gultice et al (2015:109) found a connection between high school achievement in science and success in nursing courses. The same authors observed that students who failed or withdrew from Anatomy and Physiology I or Fundamentals of Biology I reported significantly lower averages in high school chemistry.

Previous studies have consistently shown that success in the first year of undergraduate human biosciences is strongly correlated with prior experience in chemistry and biology as well as overall high school performance (Rathner & Byrne 2014:1; Mthimunye & Daniels 2016:2).

In view of the effect of background knowledge on students' performance in biological sciences, that secondary school science was found significantly advantageous for bioscience and understanding what bioscience entails (Craft et al 2013:1402), the study participants made the following recommendations;

- The admission requirements for the Diploma in nurse (general, psychiatry, community health) and midwife and biology or life science background in particular may need serious reconsideration and attention. This recommendation was made because at the school of nursing where the study was conducted, life sciences is not a mandatory selection requirement even though preference is given to candidates who have done life sciences, mathematics, and physical science (with academic point score of 24 and 27 for students who obtained matriculation certificate before 2008 and later respectively).
- Accompaniment of students by biological science teachers to ensure correlation of the subject to nursing practice
- 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.
- Remedial classes be arranged for those students who do not understand biological science.

### **Negative attitudes towards biological sciences**

According to the findings, some students lack motivation which results in the development of negative attitudes towards biological science subject and lack of commitment. Negative attitudes appear to be brought about by ineffective teaching strategies, negative attitudes of nurse educators towards the teaching of anatomy and physiology, lack of resources and some individual factors. In addition, some of the students indicated that they become demotivated because they were being told that by the lecturers and senior students that it is difficult and hard to pass anatomy and physiology.

With regard to the negative attitudes towards anatomy and physiology, the participants recommended that the student nurses together with lecturers should change their attitude towards biological science. The participants felt that senior students and other lecturers must refrain from instilling the idea that biological science subject is difficult

to pass. The student nurses have to be positive, study hard and dedicate more time into their studies.

In agreement with Levett-Jones et al (2015), the students recommended the use of teaching strategies that improve the attitudes of some learners, especially when their learning involves hands-on experiences.

### **Lack of academic commitment**

The participants acknowledged the fact that other reason for poor performance and high failure rate in biological science stem from themselves as students by stating that there are students who are less committed in their work. The possible reason is demotivation which results in student nurses becoming reluctant to put effort to study biological science. Viljoen (2015: 31) describe academic commitment as students devoting their time to educationally purposeful activities. Vogel (2016: 11) state that self-regulatory model of academic commitment means having goals that are personally relevant and have an influence on achievement because they are perceived to be personally meaningful.

Brown et al (2015:7) point out that the students' commitment can be affected negatively if there is a disproportionate relation between the degree of perceived effort required to pass an assessment and the credit received for passing it. The same author mention that demotivation can also affect commitment. Biological science is a requirement for the completion of the participants' studies, it should therefore carry personal meaning to them. Vogel (2016:11) further indicates that students who experience lower levels of self-efficacy and less personal meanings have a high likelihood to put less effort and time in their studies which will affect their academic commitment and eventually their achievement. According to Bonsaksen et al (2018:2), higher level of actual study efforts, that is, putting more time on studying, is reasonably linked with stronger motivation and with better academic performance.

Time management represents one of the most conventional subject in the realm of teaching and learning and has a positive impact on academic performance. Time management is generally described as activities that imply an effective use of time that is considered to facilitate productivity and reduce strain. The processes of managing time effectively includes setting goals, making plans, organizing activities

and continuously monitoring the progress made and making changes where it is necessary.

Studies show that about 73% of students start learning or actually learn with less than one week before the examination period (Nadinloyia et al 2013). Due to the short period available to study, the volume of academic content seem to be high and students become overwhelmed and fail to perform according to their associated intellectual abilities (Nadinloyia et al 2013:135).

According to Bonsaksen et al (2018:2) there are factors found to be influencing time to study and researchers have identified that curriculum characteristics affect the amount of time students devote to study. Such factors include difficulty of the scientific area, field of study, number of assessments and different supervised learning environments are thought to be related with the time devoted to self-study. It is the students' level of commitment and motivation to his or her studies that will determine the effort particularly time allocated for self-study in order for him or her to achieve the learning outcomes.

Recommendations brought up by participants suggested that student nurses should put time and effort in biological science, and consult on regular basis where they do not understand and to attend classes as well as to participate in class assignments and group work.

### **5.3.2 External factors**

These were factors beyond the students' control.

#### **Content overload**

The findings revealed that most student nurses mentioned that biological science content was packed with a lot of information which is given within a short space of time.

A variety of studies reported similar finding that student nurses are challenged by content-laden curricula and that students are expected to learn large content in a short period of time ( Bonsaken et al 2018; Kaylor 2014:53; Monisi 2018).

With regard to content overload, the participants recommended that the workload of biological science be reduced by decreasing practical hours and increasing the time allocated for theory. The participants' perception was that these will facilitate covering the content and yielding positive outcomes.

The same recommendation was made in the study by Tom, Coetzee and Heyns (2014:102) who conducted an appreciative inquiry into the factors influencing academic performance among students in the Eastern province of South Africa. During the dream phase of the same appreciative inquiry, the vision of students involved re-arrangement of biological sciences content to make it manageable by reducing its workload.

Karabulut, et al (2014:9-10) express a different view from the student nurses' perspectives. The same authors emphasize that acquisition of theoretical knowledge is as important as clinical practice. The authors further explain that clinical practice is the most critical part of professional nursing education and that clinical exposure facilitates transfer of acquired knowledge into practice. In addition, clinical practice assists the student nurses to obtain professional skills, critical thinking and knowledge that will be necessary for them to learn throughout their lives, and helps them to be able to make independent nursing decisions (Karabulut et al 2014:10).

The participants further recommended remedial classes and support for poorly performing students or those that did not take biology or life science in high school. In their study on developing tools to identify students at risk of failure in anatomy and physiology, related to brain structures by making connections to these words in everyday life as well as to their understanding of Spanish). Scott et al (2017:47) found that the statistically significant increases in learning for both groups suggested the activity, problem, and project-based curriculum had the potential to be an effective type of instruction, especially for bilingual learners.

### **Inadequate educational resources**



According to the participants, the environment was not conducive to learning because of inadequate appropriate learning resources for anatomy and physiology, non-utilisation of available resources, utilisation of the same ineffective teaching strategies and incompetent lecturers. The participants indicated that there were no models on which to practice because the ones in use were broken. Tanvi (2011) cited in Pinhas et al (2017:68) point out that a conducive environment facilitates learning, therefore it is imperative that educators should provide students with such an environment.

The study participants in this study recommended additional educational resources that could enhance their understanding of biological science, like the use of manikins. According to the participants' perspectives, these educational resources could facilitate understanding of the concepts. The participants mentioned that because biological science is a practical subject, they would like to have models to practice on them, because the ones in use are broken. They envisage that these could promote the application of biological science knowledge. The participants also indicated that there is a computer lab that is not being utilized, they have to use their own devices of which it becomes expensive as they have to buy data for themselves. The library service though present, does not have enough books and sometimes the librarian is not available.

#### **Inadequate utilisation of the available resources**

The participants mentioned that some of the available educational resources such as the computer laboratory are not utilized, and they have to resort using their own devices which require which them to buy data for themselves. According to the study participants, the library service though present, does not have enough books and sometimes the librarian is not available.

The participants recommended that computer laboratory be opened and utilized. The participants also recommended additional visual aids and improved library services. The participants expressed their belief, that because biological science is a practical subject, they would like to have models such as manikins on which to practice.

#### **iv Utilisation of the same uninteresting and ineffective teaching methods**

The student nurses who took part in the current study reported that the lecturers read from the books and relied on group discussions without any guidelines or explanation after reading from the book. Mhlongo (2018) reported similar findings of nurse educators not involving students fully in the teaching learning process. In agreement with study on factors that hinder the academic performance of nursing students in biological sciences by Pinehas, et al (2017), the student nurses in the current study indicated that the teaching strategies used by the lecturers for anatomy and physiology were ineffective. Jeffreys (2015:428) also identified teaching strategies as one of the academic factors that influence academic outcomes.

With regard to the use of ineffective teaching strategies, the participants recommended that lecturers should utilise a variety of teaching methods and to facilitate biological science in a more visual manner, by including more laboratory experiences and making use of visual aids like manikins. There is adequate literature that supports the use of different methods for teaching anatomy and physiology. Levey (2009:46) point out that educators of anatomy and physiology for nursing students need to use a wide variety of teaching strategies, especially kinaesthetic, in order to better engage the students in their learning. The same author suggests virtual learning environment using blackboard, study group peers, online module resources, lecture PowerPoint's, learning enrichment activities, discussion rooms, projects, multiple review sessions, homework, laboratory, optional help-sessions and assignments case studies.

With regard to the use of ineffective teaching strategies, the participants recommended that lecturers should utilise a variety of teaching methods and to facilitate biological science in a more visual manner, by including more laboratory experiences and making use of visual aids like manikins. There is adequate literature that supports the use of different methods for teaching anatomy and physiology. Levey (2009:46) point out that educators of anatomy and physiology for nursing students need to use a wide variety of teaching strategies, especially kinaesthetic, in order to better engage the students in their learning. The same author suggests virtual learning environment using blackboard, study group peers, online module resources, lecture PowerPoint's, learning enrichment activities, discussion rooms, projects, multiple review sessions, homework, laboratory, optional help-sessions and assignments case

studies. Çolak (2015:649) argue that in solving the problems encountered in anatomy education, the use of online media along with face-to-face learning enables the students to have access to the materials at will, to plan and steer their own learning, to evaluate themselves and to increase the student-student and student-teacher communication through forums.

Sharma (2017:4) highlight that nursing is a profession that is both theoretical and practical, hence the need to integrate in the curriculum the teaching methods that link theory and practice. The same author maintain that traditional teaching methods should be transformed to improve learning experiences and facilitate lifelong learning (Sharma 2017:4).

### **Lecturers incompetent, lack interest and passion for the subject**

Some nursing students indicated that there were characteristics of their nurse educators that were impacting negatively on their performance in biological science. They described their nurse educators as incompetent, with lack of interest and passion for the subject. Other student nurses indicated that some of the lecturers verbalized their lack of interest in the subject to the students.

Similar findings of incompetent lecturers who lack interest and passion for anatomy and physiology were reported in previous studies. In the study conducted by Iwu and Xesha (2011: 88) on factors affecting academic performance among university students, poorly trained teachers were found to be one of reasons for the poor students' performance. Lack of expertise in the content, lack of preparedness and ineffective lesson presentation leads to frustration to students and thus renders the subject susceptible to failure.

The recommendations made by the participants is that biological science should to be allocated to have nurse educators, who are passionate in the subject, who specializes in the subject or in-service training should be given to the current ones. In addition, continuous development of nurse educators was recommended to sharpen teaching skills and on to be on board on the new developments in facilitation process that would enhance performance from students. Academic heads should perform class visits and corrective measures should be given where incompetency is identified.

## **Unfair assessment practices**

According to the findings of the study, the participants mentioned that the assessment practices used in the teaching of anatomy and physiology were unfair in that assessment was not based on learning objectives and that the given scope for tests was misleading. According to Brown et al (2015:7), an assessment that challenges the learning of the student in unfamiliar ways (not based on learning outcomes in this study) affects the students' attitude negatively.

The findings suggest providing students with expected outcomes promote academic confidence and motivation to prepare adequately and timeously for tests and examinations. It gives students enough time to plan ahead for schedules tests and examinations and this is envisaged to improve performance in the subject.

The recommendation was that the responsible academic head should carefully monitor compliance to assessment policy across the nursing school. This exercise will ensure that there is consistency and fairness in assessment methods in all the campuses and that all assessments are according to the expected outcomes and prescribed books. Consistency, fairness and assessing according to expected outcomes may improve performance in biological science.

## **Summary of findings and reflections**

Biological science was perceived by student nurses as difficult and hard to learn. This was compounded by lecturers who showed no interest in the subject, to the extent that they verbalize lack of interest in the subject to the students. The perspectives of student nurses of high failure rate is two pronged, those that stem from internal factors, that is, those that are related to the students, such as attitudes, lack of commitment and demotivation as well as external factors, those that are beyond student control, involving the lecturers, support, resources and curriculum (too much content in a limited timeframe). Recommendations that were made were based on addressing the causes of high failure rate in biological sciences from the student nurses' perspective.

Biological science is a primary knowledge subject in the nursing education and it is included in an undergraduate nursing curriculum to empower its nurses with critical thinking and problem solving ability, to be able to make rational clinical decisions (Whyte et al 2011:1; SANC, R425, 1985, Paragraph 6(3) (f). Notwithstanding the considerable significance of biological science knowledge in nursing practice, it is well documented globally that it is a huge problem for student nurses (Whyte et al, 2011:1 & Brown et al, 2016: 56). High failure in biological science subject motivated the researcher to explore the student nurses' perspectives of the high failure rate in biological science.

The use of world café was found to be beneficial to the researcher and the students because it promoted dialogue, discussions among the students and mutual learning. It is complementary to qualitative research for specific purposes and it can be applied to any method used in qualitative research. The student nurses who took part in the world café conversations enjoyed it and were appreciative of the opportunity to make recommendations that will be implemented to improve the success rate in biological sciences.

## **5.4 RECOMMENDATIONS**

Based on the findings of the study, the following recommendations are made;

### **5.4.1 For practice**

For the nursing institutions to be effective and make a difference in student learning, particularly biological science performance, they need to revisit biological science content, ensure that assessment measures are strictly adhered to according to the policy, and provide necessary educational resources. Nurse educators have a major impact on student learning, therefore they should ensure that they create a positive environment for learning and that students are at the center of learning, should utilize teaching strategies that are relevant have the ability to offer a rich and meaningful curriculum for the full range of students. There should be measures in place to ensure that students are supported.

#### **5.4.2 Future research**

Future research should consider looking into the nurse educator competencies, effective teaching methods for biological science and student nurses' attitudes towards biological science

#### **5.5 LIMITATIONS**

The study was conducted on first and second year students at one campus of the school of nursing in the Free State, the findings will not be representative of all student nurses in the nursing school and first and second student nurses in the province.

#### **5.6 SIGNIFICANCE OF THE STUDY**

The study findings have provided deeper insights into the student nurses' perspective of the high failure rate in biological science as well as recommendations for improving the pass rate in the subject. An understanding of the student nurses' perspectives will help identify barriers and promoters of effective teaching learning in biological sciences and this will help the educators to plan the teaching better and managers to provide support to teachers of biological sciences in the form of in-service education. It is envisaged that the student nurses will collaborate with nurse educators to ensure that the recommendations are effected in order to achieve the desired pass rate in biological science. The findings of the study have the potential to contribute to the body of knowledge regarding the causes of high failure rate in biological science from the student nurses' perspective.

#### **5.7 CONCLUSION**

This chapter discussed the research design and methods used in this study, presented a summary and interpretation of the research findings and formulated conclusions. The recommendations arising from the findings to improve performance in biological science, descriptions of the limitations and significance of the study were also discussed.

In conclusion the researcher's finding suggest that the academic performance of students in biological science is influenced by external factors such as curriculum content, formative and summative assessment, shortage of educational resources and lack of practical application exposure related to biological science content and competency of nurse educators as well as internal factors such as students' attitude, lack of academic commitment. In order to minimize these factors, recommendations made by students such as ensuring that educational resources are adequate, allocating nurse educators that are have interest in the subject and use teaching methods that are appropriate for biological science will be thoroughly looked into. Student support will be enhanced to change students' attitudes in the subject and increase level of motivation and academic commitment. This will encourage time management and self- study and thus improve performance in biological science and reduce failure rate.

## LIST OF REFERENCES

- Adom, D, Yeboah, A, & Ankrah, AK. 2016. Constructivism philosophical paradigm: implication for research, teaching and learning. *Global Journal of Arts Humanities and Social Sciences* 4 (10) 1-9.
- Aldred, R. 2011. From community participation to organisational therapy? World Café and Appreciative inquiry as research methods. *Community development journal* 46(1), 57-71.
- Anney, V, N. 2014. Ensuring the Quality of the Findings of Qualitative Research: Looking at Trustworthiness Criteria. *Journal of Emerging Trends in Educational Research and Policy Studies* 5(2):272-281
- Arivananthan, M. 2015. *World café/ dynamic iteration on key discussion questions*. Unicef. From [http://www.unicef.org/knowledgeexchange/files/World\\_Cafe\\_production.pdf](http://www.unicef.org/knowledgeexchange/files/World_Cafe_production.pdf) (Accessed 17 February 2017).
- Ashelford, S, Fell, P & Goacher, PJ. 2014. Biosciences in nurse education: Is the curriculum fit for practice? Lecturers' views and recommendations from across the UK. *Journal for Clinical Nursing*, 24(19-20):797-806.
- Atemafac, J. 2014. *Consequences for nursing graduates of failing the national council licensure examination*. Walden University. From: <http://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1173&context=dissertation> (Accessed 17 May 2018)
- Araoye, M I. 2013. Redressing students' motivation and academic achievement in biology education at the federal college of education (special) Oyo. Nigeria. Oyo State. From: [https://conference.pixelonline.net/conferences/npse2013/common/download/Paper\\_pdf/071-ESM01-FP-Araoye-NPSE2013.pdf](https://conference.pixelonline.net/conferences/npse2013/common/download/Paper_pdf/071-ESM01-FP-Araoye-NPSE2013.pdf) (Accessed 8 March 2015)
- Beckmann, J. 2017. University research ethics clearances: safety nets, or a false sense of legal immunity? *South African Journal of Higher Education*, 31(3): 6–23. eISSN 1753-5913.



- Bergman, EM, de Bruin, ABH, Herrler, A, Verheijen IWH, Scherpbier, AJJA & van der Vleuten, CPM. 2013. *Students' perceptions of anatomy across the undergraduate problem-based learning medical curriculum: a phenomenographical study*. BMC medical education. From: <http://www.ncbi.nlm.nih.gov/pmc/articles/pmc422551> (Accessed 21 October 2015.)
- Blaauw, D, Ditlopo, P & Rispel L C. 2014. Nursing education reform South Africa- lessons from a policy analysis study. Global Health Action. From: <https://dx.doi.org/10.3402.gha.v7.26401> (Accessed 31 January 2018).
- Blakeman, J R, Samuelson, S J & McEvoy, K N. 2013. Analysis of a silent voice: A qualitative inquiry of embroidery created by a patient with schizophrenia. *Journal of Psychosocial Nursing* 51(6), 38-45
- Bonsaksen, T, Ellingham, B & Carstensen, T. 2018. Factors associated with academic performance among second-year undergraduate occupational therapy students. *The open journal of occupational therapy*. From <http://scholarworks.wmich.edu/ojot/vol6/iss1/14/> (Accessed 15 August 2018).
- Botha-Verhage, E, & Jacobs, S. 2017. Towards an understanding of mothers' dream, design and destiny processes in their relationship with their children in a low socio-economic environment: an appreciative inquiry. Potchefstroom, South Africa. NWU. From: <https://repository.nwu.ac.za/handle/10394/25331?show=full>. (Accessed 4 Jun 2019).
- Botma, Y, Greeff, M, Mulaudzi, M & Wright, S. 2010. *Research in health sciences*. 1<sup>st</sup> edition. South Africa: Pearson.
- Braun, V & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77–101. doi:10.1191/1478088706qp063oa.
- Braun, V & Clarke, V 2013. *Successful qualitative research: A practical guide for beginners*. London: Sage.
- Brink, H, van der Walt, C & van Rensburg, G. 2012. *Fundamentals of research methodology for healthcare professionals*. 3<sup>rd</sup> edition. Cape Town: Juta.

- Broom, M. 2016. Facilitating change and evaluating impact during a neonatal intensive care redevelopment: A participatory action research project. ACU Research Bank. From: <http://researchbank.acu.edu.au/cgi/viewcontent.cgi?article=1604&context=theses> (Accessed 8 June 2019).
- Broom, M, Brady, B, Kecskes, Z, & Kildea, S. (2013). World Café Methodology engages stakeholders in designing a Neonatal Intensive Care Unit. *Journal of Neonatal Nursing*, 19(5), 253-258.
- Brown, J & Isaacs, D. 2018. *The world cafe: living knowledge through conversations that matter*. From: <http://thesystemsthinker.com/the-world-cafe-living-knowledge-through-conversations-that-matter/2018> (Accessed 26 April 2019).
- Brown, S, White, S, Bowmar, A & Power, N. 2017. Evaluating an instrument to quantify attitude to the subject of physiology in undergraduate health science students. *Journal of University Teaching & Learning Practice* 14(1).
- Brown, S, J, White, S & Power, N. 2016. *Introductory anatomy and physiology in an undergraduate nursing curriculum*. School of Interprofessional Health Studies, Auckland University of Technology, Auckland, New Zealand. From: <http://advan.physiology.org>. (Accessed 6 May 2017)
- Burns, N. and Grove, S.K. 2011. *The practice of nursing research: appraisal, synthesis, and the generation of evidence*. 7<sup>th</sup> ed. ST Louis: Saunders Elsevier.
- Carson, L. 2011. Designing a public conversation using the World Café method. *Social Alternatives*. 30 (1)10-14
- Chang, WL & Chen, ST. 2015. The impact of World Café on entrepreneurial strategic planning capability. *Journal of Business Research*. 68(6).
- Chauke, ME. 2014. Transforming student nurses' image of nursing: An appreciative inquiry approach. Doctor of Literature and Philosophy (Dissertation). Unisa, Pretoria.

- Craft, J, Hudson, P, Plenderleith, M, Wirihana, L & Gordon, C. 2013. Commencing nursing students 'perceptions and anxiety of bioscience. *Nurse Education Today*, 33(11):1399-1405.
- Clarke, V & Braun, V. 2013. Teaching thematic analysis: over-coming challenges and developing strategies for effective learning. *The Psychologist*, 26 (2): 120-123.
- Clarke, V & Braun, V. 2013. *Successful qualitative research: a practical guide for beginners*. London. Sage.
- Cox, P, Willis, K & Coustasse, A. 2014. *The American epidemic: the U.S. nursing shortage and turnover problem*. Marshall University. From: [http://www.amnhealthcare.com/.../AMN%2018%20M002\\_CNO%Booklet\\_Final](http://www.amnhealthcare.com/.../AMN%2018%20M002_CNO%Booklet_Final) (Accessed 30 January 2018)
- Craft, J, Christensen, M, Bakon, S & Wirihana, L. 2016. *Advancing student nurse knowledge of the biomedical sciences: A mixed method study*. Pubmed. From <http://www.ncbi.nlm.nih.gov/pubmed/27771542> (Accessed 20 June 2018).
- Craig, S. 2014. *Attrition in undergraduate nursing students*. University of Victoria. Faculty of human and social development. From: [http://dspace.library.uvic.ca/bitstream/handle/1828/5699/Craig\\_Sara\\_MN\\_2014.pdf](http://dspace.library.uvic.ca/bitstream/handle/1828/5699/Craig_Sara_MN_2014.pdf) (Accessed 17 April 2018).
- Crane, J & Cox, J. 2013. More than Just a Lack of Knowledge: A discussion of the potential hidden-impact of poor pre-enrolment science background on nursing student success in bioscience subject. *International Journal of Innovation in Science and Mathematics Education*. 21(2).
- Damayanthi, H & Dharmaratne, S. 2016. *Factors affecting academic performance of nursing undergraduates in a university, sri lanka – a pilot study*. *International Journal of Evidence-Based Healthcare*. University of Adelaide. Joanna Briggs Institute. From: [http://journals.lww.com/...2016/Factors\\_Affecting\\_Academic\\_Performance\\_Nurs](http://journals.lww.com/...2016/Factors_Affecting_Academic_Performance_Nurs). (Accessed 17 April 2018).
- De Chesnay, M. 2015. *Nursing Research using data analysis: Qualitative designs and methods in nursing*. Springer Publishing Company. New York.

- De Vos AS, Strydom, H, Fouche, C.B and Delpont, CS. 2011. *Research at Grass Roots for the social sciences and human service professions*. 4th Edition. Cape Town. van Schaik Publishers
- Doggrel, SA & Schaffer, S. 2016. Attrition and success rates of accelerated students in nursing courses: a systematic review. *BMC nursing*. From <https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-016-01457> (Accessed 10 July 2017).
- Estacio, E V & Karic, T. 2015. The world café: An innovative method to facilitate reflections on internationalization in higher education. *Journal of Further and Higher education* 40(6), 731-745.
- Fallon, H & Connaughton, L. 2016. *Using a world café to explore new spaces and new models for front line services: A case study from the Irish university library sector*. New review of academic librarianship. 0(0)1-17. From: <http://dx.doi.org/10.1080/13614533.2015.1126291> (Accessed 04 August 2017)
- Filies, G, C, Yassin, Z & Frantz, J, M. 2016. Students' views of learning about an interprofessional world café method. *AJHPH* 8 (2).
- Free State School Of Nursing. 2002. *Curriculum for the Diploma in Nursing (General, Psychiatric and Community) and Midwifery*. Bloemfontein: Free State School of Nursing.
- Gill, L, Ramsey, P, Leberman, S, Atkins, S. 2016. World Café to Enhance Relationship-building for the Purpose of Developing Trust in Emotional Intelligence Training Environments. *ACPIL*. 14 (2)98-110.
- Grove, S K, Burns, N & Gray, JR. 2015. *The practice of nursing research: Appraisal, synthesis, and generation of evidence*. 8<sup>th</sup> edition. Missouri: Elsevier/Saunders.
- Gultice, A, Witham, A & Kallmeyer R. 2015. Are your students ready for anatomy and physiology? Developing tools to identify students at risk for failure, *Advance Physiological Education*. 39(2):108-115.
- Harris, RC, Rosenberg, L & O' Rourke, MEG. 2013. *Addressing the challenges of nursing student attrition*. *Journal of Nursing Education* 52(X):1-7

- Higgins-Opitz, SB & Tufts, M. 2014. Performance of first-year health sciences students in a large, diverse, multidisciplinary, first-semester, physiology service module. *Advanced Physiology Education*. From: <https://pdfs.semanticscholar.org/8533/3ee5c27b1c5cdb0fe5b4f9257e582cb1f558.pdf>? (Accessed 20 May 2016).
- Holloway, I & Wheeler, S. 2010. *Qualitative research in nursing and healthcare*. 3<sup>rd</sup> Edition, West Sussex, UK: Wiley-Blackwell.
- Hull, K, Wilson, S, & Hopp, R. 2016. Determinants of student success in Anatomy and Physiology: Do prerequisite Courses Matter. *Journal of the Human Anatomy and Physiology Society* 20(2):38-45.
- Hurley, T, J & Brown, J .2009. Conversational leadership: Thinking together for a change. *Systems Thinker* 20(09) From: <http://www.dialogue-ic.com/images/Conversational%20leadership.pdf> (Accessed 26 April 2019)
- Iliya, A. 2014. Formative and summative assessment in educational enterprise. *Journal of Education and Practice* 5(20). Iwu, CG, & Xesha D. 2011. Used bookstore as a vehicle for improved learning and development. *Education and vocational research*. From: [http://www.ifrnd.org/Resear%20Papers/v1\(3\)4.pdf](http://www.ifrnd.org/Resear%20Papers/v1(3)4.pdf). (Accessed 13 June 2015). Iwu and Xesha (2011: 87)
- Jafta, MG. 2013. *Perception of tutors and student nurses on factors that influence academic performance at nursing college*. Bloemfontein. University of Free State.
- Jayanthi,SV, Balakrishnan, S, Siok Ching, AL, Latiff, NAA & Nisirudeen, AMA. 2014. *Factors contributing to academic performance of students in a tertiary institution in Singapore*. *American Journal of Education Research* 2(9)752-758.
- Jeffreys, MR . 2015. Jeffreys' Nursing Universal Retention and Success model: Overview and action ideas for optimizing outcomes. *Nursing Education Today*, 35:425-431.
- Jeronen, E, Palmberg, I & Yli-Panula, E. 2016. Teaching methods in biology education and sustainability education including outdoor education for promoting sustainability -a literature review. *Education Sciences* 7 (1).

- Johnston, ANB. 2010. Anatomy for nurses: providing students with the best learning experience. *Nurse education in practice*.  
From: [http://www.researchgate.net/publication/40693071\\_Anatomy\\_for\\_nurses\\_Providing\\_students\\_with\\_the\\_best\\_learning\\_experience](http://www.researchgate.net/publication/40693071_Anatomy_for_nurses_Providing_students_with_the_best_learning_experience) . (10 April 2017).
- Kalpana, T. 2014. A constructivist perspective on teaching and learning: a conceptual framework. *International Research Journal of Social Sciences*.3 (1)27-29.
- Kaylor, SK. 2014. *Preventing information overload: cognitive load theory as an instructional framework for teaching pharmacology*. NCBI. From: <https://www.ncbi.nlm.nih.gov/pubmed/24444008> ( Accessed 10 September 2018).
- Kempnich, J, & Costanzo, C. 2014. World Café for Leadership Development. *Nurse Leader* 12(6).
- Koen, M, P. 2018. *The World Café as a data collection method in qualitative research in positive psychology*. NWU. From: [https://repository.nwu.ac.za/bitstream/handle/10394/31629/Koen\\_MP.pdf?sequence=1&isAllowed=y](https://repository.nwu.ac.za/bitstream/handle/10394/31629/Koen_MP.pdf?sequence=1&isAllowed=y) (Accessed 13 April 2019)
- Lagrosen, Y. 2017. The Quality Café: developing the World Café method for organisational learning by including quality management tools. *Total Quality Management & Business Excellence* In press From: <http://dx.doi.org/10.1080/14783363.2017.1377606>. (Accessed 7 June 2019)
- Langtree, EM. 2014. *Factors contributing to success in anatomy and physiology in first year students in KZNCN nursing programme*. Durban. Durban University of Technology. From: [Openscholar.dut.ac.za/handle/10321/1254](https://openscholar.dut.ac.za/handle/10321/1254). (Accessed 20 May 2017)
- Lawrence, ASA. 2014. Relationship between study habits and academic achievement of higher secondary school students. *Education*.4 (6).
- Lebata, MC.2014. *An investigation of performance in the biology 5090 at selected high schools in Lesotho*. University of South Africa. From: [uir.unisa.ac.za/handle/10500/14136](http://uir.unisa.ac.za/handle/10500/14136) ▼ (Accessed 30 January 2018).

- Lenzo, A .2014. The world café: We are wiser together. *Collaborative services* From: <http://www.theworldcafe.com/wp-content/uploads/2017/04/Interview-with-Amy-Lenzo.pdf> (Accessed 26 April 2019)
- Levett-Jones, T, Andersen P, Reid-Searl, K, Guinea S, McAllister M, Lapkin S, Palmer, L & Niddrie, M. 2015.Tag team simulation: An innovative approach for promoting active engagement of participants and observers during group simulations. *Nurse Education in Practice*. From: <https://daneshyari.com/article/preview/366868.pdf> (Accessed 16July 2018)
- Libao, NJP, Sagun, JJB, Tamangan, EA, Pattalitan, AP, Dupa, MED & Bautista, RG. 2016. Science learning motivation as correlate of students' academic performance. *Journal of technology and science education*. 6(3)209-218.
- Longman exams coach.2007. [CD-ROM] .Available: Pearson Education Limited.
- MacFarlane, A, Galvin, R, O'Sullivan, M, McInerney, C, Meagher, E, Burke, D & LeMaster, JW. 2016. Participatory methods for research prioritization in primary care: an analysis of the World Café approach in Ireland and the USA. *Family Practice*. 34(3) 278–284.
- McVicar, A, Andrew, S & Kemble, R. 2015. The bioscience problem for nursing students: an integrative review of published evaluations of year 1 bioscience, and proposed directions for curriculum development. *Nursing Education Today*, 35(3):500-509.
- Maguire, M, Delahunt, B. 2017. Doing a thematic analysis: a practical, step-by-step guide for learning and teaching scholars. *Dundalk Institute of Technology*. 1(3) From:<http://ojs.aishe.org/index.php/aishe-j/article/viewFile/335/553> (Accessed 28 September 2018)

- Makhoba, NA. 2016. Selection criteria: a factor associated with academic performance of student nurses at a public nursing college. University of South Africa. From: [uir.unisa.ac.za/handle/10500/20944](http://uir.unisa.ac.za/handle/10500/20944) ▼ (Accessed 31 January 2018)
- Manson, TA. 2014. *A relationship between matriculation English results and academic performance in nursing students at the Kwazulu-Natal College of nursing*. Durban University of Technology. From: [http://ir.dut.ac.za/bitstream/10321/1247/1/MANSON\\_2014pdf](http://ir.dut.ac.za/bitstream/10321/1247/1/MANSON_2014pdf) (Accessed 20 May 2017).
- Mathevula, F R & Khoza L B. 2012. *Nurse educators and student nurse neophytes perceptions of good interaction in the classroom*. Dept of advanced Nursing Science. University of Venda. South Africa.
- Mayner, L, Gillham, D, & Sansoni, J. 2013. Anatomy and Physiology for Nursing Students: is problem- based learning effective? *Professioni Infermieristiche* 66(3): 182-186.
- Merkly, B, R. 2016. Student nurse attrition: a half century of research. *Journal of Nursing Education and Practice*. 6(3).
- Mohudi, C.M. 2013. An analysis of college based nursing students' performance in Bio Natural Science. Master of Science in Nursing Dissertation. Witwatersrand University. From: <http://wiredspace.wits.ac.za/jspui/bitstream/10539/15262/1/Final%20Thesis.291013.pdf>. (Accessed on 10 September 2017).
- Monisi, F. 2018. Student nurses perceptions and attitudes towards anatomy and physiology in Limpopo, South Africa. Master of Arts in Nursing Science (Dissertation). Unisa, Pretoria.
- Miller, CJ & Metz, MJ. 2014. A comparison of professional-level faculty and student perceptions of active learning: its current use, effectiveness, and barriers. *Advances in Physiology Education*, 38(3): 246-252.



- Motseo, PI. 2017. Evaluating the emergency nursing programme: views of the students. University of South Africa. From: <http://uir.unisa.ac.za/handle/10500/20993> (Accessed 18 July 2018)
- Moynihan, S, Paakkari, L, Välimaa, R, Jourdan, D & Mannix-McNamara, P. 2015. *Teacher competencies in health education: results of a Delphi study*. University of Limerick Institutional Repository. From: <http://hdl.handle.net/10344/4736>. (Accessed 24 October 2018)
- Mthimunye, K D T & Daniels, FM. 2017. *Performance in grade 12 mathematics and science predicts student nurses' performance in first year science modules at a university in the Western Cape*. University of Western Cape. From: <https://curationis.org.za/index.php/curationis/article/view/1776/2202> (Accessed 31 January 2018).
- Murray, M. 2014. Factors affecting graduation and student dropout rate at the University of KwaZulu-Natal. *South African Journal of Science*. From: [http://www.sajs.co.za/sites/default/files/publications/pdf/Murray\\_Research%20Article.pdf](http://www.sajs.co.za/sites/default/files/publications/pdf/Murray_Research%20Article.pdf). (Accessed 13 June 2015)
- Nadinloyia, KB, Hajloob, N, Garamaleki, NS & Sadeghid, H. 2013. The study efficacy of time management training on increase academic time management of students. *Procedia - Social and behavioral sciences* 84(2013) 134-138.
- Ngema, MH. 2016. *Factors that cause poor performance in science subjects at Ingwavuma circuit*, Pretoria. University of South Africa. From: <http://uir.unisa.ac.za/handle/10500/23003> (Accessed.08 Jan 2018).
- Nowell, LS, Norris, JM, White, DE & Moules, NJ. 2017. Thematic analysis: striving to meet the trustworthiness criteria. *International Journal of Qualitative methods*.16:1-13.
- Pinehas, L, N, Mulenga, E & Amadhila, J. 2016. Factors that hinder the academic performance of the nursing students who registered as first years in 2010 at the University of Namibia (UNAM), Oshakati Campus in Oshana, Namibia. *Journal of nursing education and practice*. 7(8): 63-71.

- Polit, DF, & Beck, CT. 2012. *Nursing research: generating and assessing evidence for nursing practice*. 9<sup>th</sup> edition. Wolters Kluwer. Lippincott Williams & Wilkins.
- Rafferty, B & Kyriacos, U. 2016. Final year nursing students' self-reported understanding of the relevance of bioscience. *International Journal of Nursing and Midwifery* 8(5): 35-46.
- Rajesh, KS. 2017. Emerging innovative teaching strategies in nursing. *JOJ Nursing & Health Care* 1(2)-April 2017.
- Rathener, JA & Byrne G. 2014. The use of team-based, guided inquiry to overcome educational disadvantages in learning human physiology: a structural equation model. *Adv Physiol Education* 38(3) 221-8.
- Ross, K. 2016. *Factors influencing the academic success of first year students in chemistry at an agricultural training institution*. Stellenbosch University. From: <http://scholar.sun.ac.za> (Accessed 17 April 2018)
- Schmidt, N A & Brown, J M. 2015. *Evidence-based practice for nurses: appraisal and application of research*. Burlington: Jones & Bartlett Learning.
- Scott, AJ, Louw, G & Kahn, D. 2017. The value of supplementary anatomy workshops for improving undergraduate performance. *Surgical Education*, 55(4):46-49.
- Shapira-Lishchinsky, O. 2014. *Simulation-based constructivist approach for education leaders*. SAGE.
- Simelane, R, S. 2017. *Perceptions of nurse educators regarding selection criteria of first-year nursing students in the West Rand region nursing college*. University of South Africa.
- South Africa. 1985. *Regulation relating to the approval of and the minimum requirements for the education and training of a Nurse (General, Psychiatry Community) and Midwife leading to registration*. Pretoria: Government Printers.
- South Africa. 2005. *Nursing Act, no.33, 2005, as amended*. Pretoria: Government Printer

- South Africa (Republic). Department of Health. 2013. *The national strategic plan for nurse education, training and practice (2012/13-2016/17)*. Pretoria: Government Printers.
- Sutton, J & Austin, Z. 2015. Qualitative research: data collection, analysis, and management. *The Canadian Journal of Hospital Pharmacy* 68(3), 226-231.
- Teza, P, Miguez, V, B, Fernandes, R, F, de Souza, J, A, Dandolini, G, A & de Abreu, A, F. 2013. Geração de ideias: aplicação da técnica world café. *IJKEM* 2(3)
- Thalluri, J. 2016. Bridging the gap to first year health science: early engagement enhances student satisfaction and success. *Student Success* 7(1): 37-48.
- Tom, F, Coetzee, I & Heyns, T. 2014. Factors influencing academic performance in biological sciences among students in a nursing education institution in the Eastern Cape Province: An appreciative inquiry approach. *African Journal for Physical, Health Education, Recreation and Dance*. September (Supplement 3), 102-115.
- Torresa, J, G, & Costa Neto P, L, O. 2018. World Café method integrated with QFD for obtaining the Voice of the Customers. From: [https://www.researchgate.net/publication/328396461\\_World\\_Cafe\\_method\\_integrated\\_with\\_QFD\\_for\\_obtaining\\_the\\_Voice\\_of\\_the\\_Customerustomer](https://www.researchgate.net/publication/328396461_World_Cafe_method_integrated_with_QFD_for_obtaining_the_Voice_of_the_Customerustomer) (Accessed 26 April 2019).
- Tshotsho, B, Mumbembe, L & Cekiso, M. 2015. Language challenges facing students from the Democratic Republic of Congo in a university in South Africa. *International Journal of Education Science*, 8(3):597-604.
- Quality assessment framework for bioscience in nursing education. 2016. *Higher Education Academy*. From: [https://www.heacademy.ac.uk/.../bine\\_biosciences\\_qa\\_framework\\_b-qaf\\_july\\_16.pdf](https://www.heacademy.ac.uk/.../bine_biosciences_qa_framework_b-qaf_july_16.pdf)▼. (Accessed 31 January 2018).
- Vaismoradi, M, Jones, J, Turunen, H & Snelgrove, S. 2016. Theme development in qualitative content analysis and thematic analysis. *Journal of nursing education and practice* 6 (5).

- Van Graan, A, C, Williams, M, J, S & Koen, M, P .2016. Professional nurses' understanding of clinical judgement: A contextual inquiry. *Science Direct*.21.280-293.
- Van Wyngaarden, A, Leech R, & Coetzee I, M. 2018. Assessing the value of action research: using a world café to explore the professional journey of nurse educators. *SA Journal of Higher Education*. 32 (6).
- Viljoen, B.2015. *The relationship between academic commitment and resilience for education: students at the University of Pretoria*. University of Pretoria. From: [https://repository.up.ac.za/bitstream/handle/2263/50828/Viljoen\\_Relationship\\_2015.pdf;sequence](https://repository.up.ac.za/bitstream/handle/2263/50828/Viljoen_Relationship_2015.pdf;sequence) (Accessed 30 October 2018)
- Vogel, FR, & Huma-Vogel S. 2016. Academic commitment and self-efficacy as predictors of academic achievement in additional materials science. *Higher Education research and development* 35 (6).
- Whyte, A & Tedds, J. 2011. Making the Case for Research Data Management. DCC Briefing Papers. Edinburgh: Digital Curation Centre. Available online: <http://www.dcc.ac.uk/resources/briefing-papers>.
- Whyte, DG, Madigan, V, & Drinkwater, EJ. 2011. *Predictors of academic performance of nursing and paramedic students in first year Bioscience*. From: <http://www.ncbi.nlm.nih.gov/pubmed/21247669> . (Accessed 21 October 2015)
- World café 2008.The world café. From <http://www.theworldcafe.com/pdfs/Cafetogo.pdf>
- Yankeelov, PA, Faul, AC & PhD, D'Ambrosio, J, G. 2018. World Cafés Create Healthier Communities for Rural, Older Adults Living With Diabetes. *Sage Journals*. From: <http://journals.sagepub.com/doi/abs/10.1177/1524839918760558> (Accessed 10 June 2019)

## ANNEXURE: A

ble  
nd

**RESEARCH ETHICS COMMITTEE: DEPARTMENT OF HEALTH STUDIES**  
**REC-012714-039 (NHERC)**

11 October 2017

Dear Mrs Motshedisi Mavis Mosebi

**Decision: Ethics Approval**

**HS HDC/727/2017**

Mrs Motshedisi Mavis Mosebi  
Student 30154677

Supervisor: Dr ME Chauke  
Qualification: D Litt et Phil  
Joint Supervisor:  
Qualification:-

**Name:** Mrs Motshedisi Mavis Mosebi

**Proposal:** Student nurses perspectives of the high failure rate in biological sciences

**Qualification:** **MPCHS94**

Thank you for the application for research ethics approval from the Research Ethics Committee: Department of Health Studies, for the above mentioned research. Final approval is granted from 11 October 2017 to 11 October 2022.

*The application was reviewed in compliance with the Unisa Policy on Research Ethics by the Research Ethics Committee: Department of Health Studies on 6 September 2017.*

*The proposed research may now commence with the proviso that:*

- 1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*
- 2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Research Ethics Review Committee, Department of Health Studies. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.*

irly  
the  
ee:



**ANNEXURE: B**

5 Pomona Street

Riebeeckstad

Welkom

9459

15 March 2018

THE EXECUTIVE MANAGER

FREE STATE DEPARTMENT OF HEALTH

BLOEMFONTEIN

5100

**RE: Request for permission to conduct research at a nursing school.**

Dear Doctor / Professor

My name is Motshedisi Mavis Mosebi. I am currently registered with the University of South Africa (UNISA) for a Masters degree in Nursing Science. I request permission to conduct research at your nursing school. The title of the study is *Factors associated with high failure rate in Biological Science; student nurses' perspectives*. The study will be conducted under the supervision of Dr M E Chauke.

The purpose of study is to explore and describe factors associated with high failure rate in Biological Sciences at a nursing school.

The findings of this study have potential to contribute to the body of knowledge on factors associated with high failure rate in Biological sciences from the student nurses' perspectives. In addition, the findings will provide the school with the necessary student nurses' feedback as a performance measure of Biological Sciences teaching and learning in order to achieve the desired learning outcomes and for improvement of teaching Biological Sciences

The research is focused on the first and second year basic nursing students. Data will be collected by means of world café method. The study will be carried out in strict accordance with the following ethical protocols in order to protect the rights of the institution and those of the study participants, the student nurses;

**Informed consent:** before signing the consent form, the student nurses will be given information regarding the study purpose, procedures, and expected duration of participation in the covering letter that will accompany the consent form. Student nurses who have not been given informed consent will be excluded from the study.

**Confidentiality and anonymity:** the names of the student nurses will not be written on the data collection instrument. The identity of the nursing school will be protected and not disclosed in any way. All the data collected will be kept confidential, and protected from unauthorised access.

**Justice:** the researcher will make use of the predetermined inclusion criteria to select participants for the study. The researcher is aware of the potential vulnerability of all the participants because of their status as student nurses and the researcher as their lecturer. Adequate information about the study will be given including the participants right to refuse to participate or withdraw from the study at any time without explanation if they so wished.

**Beneficence and non-maleficence:** Beneficence requires a researcher to minimize harm and maximize benefit to participants. The researcher is obliged to avoid subjecting participants to unnecessary risks of harm or discomfort. In ensuring that participants are protected from harm and discomfort, including exploitation, the researcher will ensure that participants are treated with respect and sensitivity from commencement until completion of the research process. Participants will be provided with contact details of the researcher should they experience any psychological or emotional distress. They will also be assured that information given will not be used against them.

**Scientific integrity:** the research process will be followed and documented and the research findings will be disseminated by means of articles in relevant journals.



I have provided you with a copy of my proposal which includes copies of data collection instrument, consent form and other related documents to be used in the research process.

Sincerely

Motshedisi Mavis Mosebi (Researcher)

Master in Nursing Science, University of South Africa

Student Number: 30154677

**ANNEXURE: C**



health

Department of  
Health  
FREE STATE PROVINCE

11 July 2018

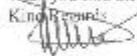
Mrs. MM Mosebi  
5 Pomona Str.  
Riebeeckstad  
Welkom, 9459

Dear Mrs. MM Mosebi

**Subject: Student nurses perspectives of the high failure rate in biological sciences**

- Please ensure that you read the whole document. Permission is hereby granted for the above-mentioned research on the following conditions:
- Participation in the study must be voluntary.
- A written consent by each participant must be obtained.
- Serious /Adverse events to be reported to the Free State department of health and/or termination of the study.
- Ascertain that your data collection exercise neither interferes with the day to day running of Bongaun Hospital nor the performance of duties by the respondents in health care workers.
- Confidentiality of information will be ensured and please do not obtain information regarding the identity of the participants.
- **Research results and a complete report should be made available to the Free State Department of Health on completion of the study (a hard copy plus a soft copy).**
- Progress report must be presented not later than one year after approval of the project to the Ethics Committee of The University of the South Africa and to Free State Department of Health.
- Any amendments, extension or other modifications to the protocol or investigators must be submitted to the Ethics Committee of The University of the South Africa and to Free State Department of Health.
- **Conditions stated in your Ethical Approval letter should be adhered to and a final copy of the Ethics Clearance Certificate should be submitted to [schegalar@fshealth.gov.za](mailto:schegalar@fshealth.gov.za) or [lilobekom@fshealth.gov.za](mailto:lilobekom@fshealth.gov.za) before you commence with the study.**
- No financial liability will be placed on the Free State Department of Health
- Please discuss your study with the institution manager/CEOs on commencement for logistical arrangements.
- Department of Health to be fully indemnified from any harm that participants and staff experiences in the study.
- Researchers will be required to enter in to a formal agreement with the Free State department of health regulating and formalizing the research relationship (document will follow)
- You are encouraged to present your study findings/results at the Free State Provincial health research day.
- Future research will only be granted permission if correct procedures are followed see <http://nhd.hsa.org.za>

Thank you and the above in order.

Kind Regards  


Dr D Mula

HEAD: HEALTH

Date: 19/07/18

Head - Health  
PO Box 227, Bloemfontein, 9500  
4<sup>th</sup> Floor, Executive Suite, Bechoa House, off Naidom, and Harvey Road, Bloemfontein  
Tel: (011) 401 1845 Fax: (051) 438 1562 e-mail: [users@fshealth.gov.za](mailto:users@fshealth.gov.za) / [info@fshealth.gov.za](mailto:info@fshealth.gov.za)

[www.fs.gov.za](http://www.fs.gov.za)

ANNEXURE: D

5 Pomona Street

Riebeeckstad

Welkom

9459

15 March 2018

THE PRINCIPAL

FREE STATE SCHOOL OF NURSING

BLOEMFONTEIN

5100

**RE: Request for permission to conduct research at a nursing school.**

Dear Doctor / Professor

My name is Motshedisi Mavis Mosebi. I am currently registered with the University of South Africa (UNISA) for a Masters degree in Nursing Science. I request permission to conduct research at your nursing school. The title of the study is Factors associated with high failure rate in Biological Science; student nurses' perspectives. The study will be conducted under the supervision of Dr M E Chauke.

The purpose of study is to explore and describe factors associated with high failure rate in Biological Sciences at a nursing school.

The findings of this study have potential to contribute to the body of knowledge on factors associated with high failure rate in Biological sciences from the student nurses' perspectives. In addition, the findings will provide the school with the necessary student nurses' feedback as a performance measure of Biological Sciences teaching and learning in order to achieve the desired learning outcomes and for improvement of teaching Biological Sciences

The research is focused on the first and second year basic nursing students. Data will be collected by means of world café method. The study will be carried out in strict

accordance with the following ethical protocols in order to protect the rights of the institution and those of the study participants, the student nurses;

**Informed consent:** before signing the consent form, the student nurses will be given information regarding the study purpose, procedures, and expected duration of participation in the covering letter that will accompany the consent form. Student nurses who have not been given informed consent will be excluded from the study.

**Confidentiality and anonymity:** the names of the student nurses will not be written on the data collection instrument. The identity of the nursing school will be protected and not disclosed in any way. All the data collected will be kept confidential, and protected from unauthorised access.

**Justice:** the researcher will make use of the predetermined inclusion criteria to select participants for the study. The researcher is aware of the potential vulnerability of all the participants because of their status as student nurses and the researcher as their lecturer. Adequate information about the study will be given including the participants right to refuse to participate or withdraw from the study at any time without explanation if they so wished.

**Beneficence and non-maleficence:** Beneficence requires a researcher to minimize harm and maximize benefit to participants. The researcher is obliged to avoid subjecting participants to unnecessary risks of harm or discomfort. In ensuring that participants are protected from harm and discomfort, including exploitation, the researcher will ensure that participants are treated with respect and sensitivity from commencement until completion of the research process. Participants will be provided with contact details of the researcher should they experience any psychological or emotional distress. They will also be assured that information given will not be used against them.

**Scientific integrity:** the research process will be followed and documented and the research findings will be disseminated by means of articles in relevant journals.

I have provided you with a copy of my proposal which includes copies of data collection instrument, consent form and other related documents to be used in the research process.

Sincerely

Motshedisi Mavis Mosebi (Researcher)

Master in Nursing Science, University of South Africa

Student Number: 30154677

**ANNEXURE: E**



health

Department of  
Health  
FREE STATE PROVINCE

<b>DATE</b>	22 March 2018		
<b>TO:</b>	<b>Ms. MOSEBI M.M.</b> 5 Pomona Street Riebeeckstad WELKOM	<b>FROM</b>	<b>Me N.M.M. RALIKONYANA</b> Acting Principal Free State School of Nursing BLOEMFONTEIN

**Re: PERMISSION TO CONDUCT RESEARCH**

Dear Ms. Mosebi M.M

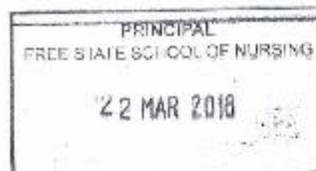
Permission is hereby granted for you to use students of the Free State School of Nursing to conduct research on "Factors associated with high failure rate in Biological Science: Student Nurses' Perspective"

This permission is subject to approval and conditions of Head of Free State Department of Health. You will also be expected to provide the College with ethical clearance from the University of South Africa.

Wishing you all the best with your studies.

Warm regards

  
N.M.M. Ralikonyana  
Acting Principal  
Free State School of Nursing  
051 403 9831



Me N.M.M. Ralikonyana: Acting Principal, Free State School of Nursing, Private Bag X20520, Bloemfontein, 9300. Tel 051 403 9831 Fax 051 430 6469, e-mail ralikonynm@fshealth.gov.za

**ANNEXURE: F**



FREE STATE SCHOOL OF NURSING  
NORTHERN CAMPUS



health

Department of  
Health  
FREE STATE PROVINCE

<b>DATE:</b>	18 April 2018	<b>FILE NO:</b>	
<b>TO:</b>	Ms Mosebi M.M 5 Pomona Str Riebeeckstad <b>WELKOM</b>	<b>FROM:</b>	MS M M J Mokhomu FSSON Northern Campus

**SUBJECT: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN THE  
FREE STATE SCHOOL OF NURSING: NORTHERN CAMPUS**

1. Your letter dated and receive 23.03.2018 regarding the matter above is hereby acknowledge and refers.
2. Approval is hereby granted for you to collect data at the Free State School of Nursing: Northern Campus
3. Please adhere to all conditions as stipulated in the letter from Head of Department of Health.
4. Wishing you the best and success in your studies

Kinds Regards

**PERSON IN CHARGE OF THE  
SCHOOL NORTHERN CAMPUS  
FSSON –Northern Campus**

FREE STATE SCHOOL OF  
NURSING, WELKOM

18 APR 2018

Ms M.M.J Mokhomu: DEAN – Free State School of Nursing-Northern Campus, Private Bag X290  
Mothusi Road, WELKOM, Tel: (057) 396 6240/1/2/3 Fax: (057) 396 3719, E-mail: [mokhomu@health.gov.za](mailto:mokhomu@health.gov.za)

www.fsgov.za

## **ANNEXURE: G**

### **PARTICIPANT INFORMATION AND INFORMED CONSENT FORM**

#### **Dear Respondent**

My name is Motshedisi Mavis Mosebi, a registered student at the University of South Africa doing a Master's degree in Nursing Science. I am conducting a research project entitled: Factors associated with high failure rate in biological science; the student nurses' perspectives. The purpose of study is to explore and describe the factors associated with high failure rate in Biological Science at a nursing school.

I would appreciate it very much if you could consider participating in my research. Your participation is important because it will provide the nursing school with valuable feedback regarding the performance measure of Biological Sciences teaching and learning in order to achieve the desired learning outcomes and for improvement of teaching Biological Sciences. In addition, the findings of this study will contribute to current literature on factors associated with high failure rate in Biological sciences from the student nurses' perspectives.

Your involvement in the study will be in the form of participation in small group discussion known as world café. Participation is voluntary; meaning that you can refuse to participate or withdraw from the study at any time if you feel uncomfortable even if you have already signed a consent form. Refusal to participate will not affect your studies in any way. Confidentiality will be ensured by not using your name on the data collection instrument and the final report of this study. There are no foreseeable physical discomforts involved in participating in this study.

Your participation in this research is highly appreciated. I welcome any questions you may have about the study and your participation. You can contact me at numbers given below.

Sincerely

Motshedisi Mavis Mosebi (Researcher)

Master in Nursing Science, University of South Africa

Telephone: 057 396 6242

Cell phone: 0824781273

Email: [mmosebi@gmail.com](mailto:mmosebi@gmail.com). , [mosebimm@fshealth.gov.za](mailto:mosebimm@fshealth.gov.za).



## CONSENT FORM

I, the undersigned agree to participate in the above mentioned research study. I confirm that the researcher has explained the following to me:

- My participation in the study is voluntary and may withdraw and discontinue participation at any time without penalty
- I will not be paid for my participation in the study.
- The researcher will not identify me by name in any reports and that my confidentiality as a participant in this study will be maintained

I have read and I understand the information provided to me and have had all my questions answered to my satisfaction and I voluntarily agree to participate in the study.

Name of participant \_\_\_\_\_ Age of the participant-----

Signature of the participant\_\_\_\_\_ Signature of the researcher

Date\_\_\_\_\_

## **ANNEXURE: H**

### **WORLD CAFÉ FOCUS GROUP INTERVIEW GUIDE**

#### **PART 1: Introduction**

Thank you for agreeing to take part in my study. My name is Motshedisi Mosebi and I will be conducting this interview. Please remember that you are under no obligation to participate in this interview; you can refuse to participate or to withdraw from the study at this point without explanation or consequences. I promise to treat all information collected from this interview as highly confidential and it shall not be reported in a manner that identifies or links you with the information. In addition, please, no information or discussion outside the group should take place in order to ensure confidentiality. This interview will take about 120 minutes

Do you have any questions?

Thank you for signing the consent form to take part in this interview.

#### **PART 2: Information to participants**

Before we start, I would like to explain how this interview is going to be conducted because it is different from what you may be used to. You will be participating in a small group interview discussion known as the World Café.

During the world café a group or groups of people discuss a topic at several tables, with individuals switching tables periodically and getting introduced to the previous discussion at their new table by a “table host” in a structured conversational process as follows;

- Groups of 5-6 people will be seated around small café type tables with paper table cloths and pens
- Each group will go through 4 (four) rounds of conversations for approximately 25 minutes
- At a table, you will discuss open-ended questions on high failure rate in anatomy and physiology, which is a matter of great concern to you.

- You will be expected to make notes, key ideas and drawings on the paper table cloths provided.
- After the initial round of conversation, group members switch tables and one person remains at the table as a “table host” who will briefly welcome people and fills them in on highlights of the previous discussion. Other members who moved to the next table serve as travellers taking the ideas from one group and adding to them, developing insights through multiple conversations with a diverse number of people, and expanding the collective knowledge of the group.
- As group members move in several rounds of conversations, ideas, questions and themes begin to link and connect
- After the third round, all tables in the room will be cross-pollinating ideas insights from previous conversations
- A gallery tour of all tablecloths from all the conversations on the wall will be taken
- All groups will come together to share insights and discoveries, patterns can be identified and possibilities for action can emerge, for example recommendations for improving the success rate in anatomy and physiology among student nurses
- A café is not complete without snacks and beverages, so refreshments will be served.

### **PART 3: Interview schedule (World café questions)**

- From your perspective, what are the causes of the high failure rate in anatomy and physiology?
- What recommendations do you make to improve the pass rate in and physiology?

***THANK YOU FOR TAKING PART IN MY STUDY***

**ANNEXURE: I**

**Confidentiality binding agreement**

Research project: Factors associated to high failure rate in Biological Sciences at a nursing school: The perspective of student nurses.

I..... (participant) to the World Café for the study entitled.....(title), conducted by .....(student name), Doctoral/Master student at University of South agree freely to participate to the Focus Group Discussion and to abide to the following:

- I will keep confidential all the information shared during the world café conversation
- I will respect the opinion expressed by my group members
- I will not disclose any information outside the group
- I will not link any information to any group member
- The researcher/facilitator agrees to take all reasonable steps to protect personal identity of the participants
- The researcher/facilitator agrees to take all reasonable steps to protect the privacy of the participants.

I fully understand the content of this entire agreement and undertake to freely participate to the group discussion.

The researcher            The participant

Name: ..... Name: .....

Sign..... Sign: .....

Date..... Date.....