

**COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND  
LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B.  
PROGRAMME**

**by**

**CAROL OLIVIA LARSON**

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**31 JANUARY 2014**

**STUDY LEADER: DR J BEZUIDENHOUT**

**CO-STUDY LEADER: DR LJ VAN DER MERWE**

## DECLARATION

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I hereby declare that the compilation of this mini-dissertation is the result of my own independent investigation. I have endeavoured to use the research sources cited in the text in a responsible way and to give credit to the authors and compilers of the references for the information provided, as necessary. I have also acknowledged those persons who have assisted me in this endeavour. I further declare that this work is submitted for the first time at this university and faculty for the purpose of obtaining a Master's Degree in Health Professions Education and that it has not previously been submitted to any other university or faculty for the purpose of obtaining a degree. I also declare that all information provided by study participants will be treated with the necessary confidentiality.

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## DEDICATION

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*I dedicate this mini-dissertation to my parents, who provided support and encouragement to me during the initial phase of the study. In particular, I wish to commend my mother who remained positive and was a continual source of much needed inspiration during the latter phase of the study.*

*I also dedicate this endeavour and extend my sincere thanks to the staff of the School of Medicine at the University of the Free State, without whom this project would not have been completed.*

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## LIST OF ABBREVIATIONS AND ACRONYMS

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CHE:	Council on Higher Education
CBL:	Community-based learning
CBME:	Community-based medical education
CVS:	Cardiovascular system
DoE:	Department of Education
DoH:	Department of Health
ECG:	Electrocardiography
<i>EKG:</i>	<i>Elektrokardiografie</i>
FHS:	Faculty of Health Sciences
<i>GBRSA:</i>	<i>Gesondheids Beroepe Raad van Suid-Afrika</i>
HE:	Higher Education
HEI:	Higher Education Institution
HEQC:	Higher Education Quality Committee
HPCSA:	Health Professions Council of South Africa
HPE:	Health Professions Education
IIME:	Institute for International Medical Education
M.B.,Ch.B:	Bachelor of Medicine and Bachelor of Surgery
NQF:	National Qualifications Framework
OBE:	Outcomes-based Education
RSA:	Republic of South Africa
SAQA:	South African Qualifications Authority
SoM:	School of Medicine
SWOT:	Strengths, weaknesses, opportunities and threats
TBL:	Task-based learning
TB CB:	Task-based community-based
TBME:	Task-based medical education
UFS:	University of the Free State
UK:	United Kingdom
USA:	United States of America
<i>UV:</i>	<i>Universiteit van die Vrystaat</i>
WHO:	World Health Organisation

## SUMMARY

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**Key terms:** community-based teaching and learning, task-based teaching and learning, competency-based learning, electrocardiography teaching and learning, authentic learning, mixed-methods research design

The current global emphasis on appropriate standards for medical education and greater civic engagement by higher educational institutions, and the value of electrocardiography as diagnostic aid stimulated the researcher to perform this study.

Globally electrocardiography is an essential exit-level core competency of undergraduate medical programmes. Although an outcome-based curriculum was introduced by the UFS School of Medicine in 2000, certain aspects of competency-based education (such as the registration and interpretation of an electrocardiogram) can be adapted and included in outcome-based curricula.

Prior to the commencement of this study, a preliminary literature review revealed that little research had been performed with regard to the use of electrocardiography as a learning task in community settings in the preclinical phase of medical curricula.

The overall goal of the study was to facilitate the transition between electrocardiography teaching and learning in the preclinical and clinical phases of the UFS medical curriculum.

The problem that initiated the research was that more information was required regarding the practicability of implementing electrocardiography teaching and learning in community settings during semesters four and five of the UFS undergraduate M.B.,Ch.B. curriculum.

To address the problem, two research questions were formulated concerning the generic, context-specific and task-specific issues that inform decisions regarding community-based electrocardiography learning during semesters four and/or five of

the UFS undergraduate medical curriculum and the attitudes and opinions of a purposive sample of Faculty members regarding community-based electrocardiography learning in semesters four and/or five.

To answer the research questions, two research objectives were pursued regarding the identification of the principal issues and challenges that inform decisions regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum and the collection of quantitative and qualitative information from a purposive sample of personnel employed at the UFS Faculty of Health Sciences.

The first part of the study consisted of a comprehensive literature review, which assisted the researcher to identify applicable key aspects for inclusion in the interview schedule used for the empirical study.

The survey was performed with a view to later formulating an effective strategy to facilitate the transition between the electrocardiography learning provided in the preclinical and clinical phases of the UFS M.B.,Ch.B. curriculum and possibly incorporate four additional hours of community-based learning in phase II of the curriculum.

Ninety-two (92) per cent of the persons in the sample consented to participate in the study and a pilot study was conducted, to improve the reliability, validity and trustworthiness of the study.

The data collected from the interviews was analysed and a description and discussion of the research findings were documented.

Based on the literature review and the responses of the interviewees, several prominent conclusions were reached. Important faculty-related and community-related key issues and challenges were identified, and interviewees' favourable responses regarding CBL, task-based CBL and CB ECG learning in the UFS undergraduate medical curriculum indicated that further related research is justified.

Interviewees' responses with regard to the practicability of implementing CB ECG learning in the preclinical phase were moderately favourable and useful recommendations were made. Of significance to the planning of future research studies was that twenty-six per cent more respondents supported the implementation of CB electrocardiography learning during the clinical phase of the curriculum than was the case for the preclinical phase.

These research findings can assist with decisions as to whether future (more comprehensive and potentially more costly) research projects are justified.

The appropriate implementation of electrocardiography, as community-based learning task during the preclinical and/or clinical phases, can contribute to a greater degree of community engagement and an improvement in the quality of electrocardiography learning in the UFS undergraduate curriculum. This should therefore benefit all the stakeholders involved.

## OPSOMMING

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**Sleuteltermes:** gemeenskapsgebaseerde onderrig en leer, taakgebaseerde onderrig en leer, bevoegdheid-gebaseerde leer, elektrokardiografie onderrig en leer, outentieke leer, gemengde metodes navorsingsontwerp

Die huidige globale klem op toepaslike standaarde vir mediese onderrig en groter publieke betrokkenheid deur hoër onderrig-instansies en die waarde van elektrokardiografie as diagnostiese hulpmiddel het die navorser gestimuleer om hierdie studie te doen.

Elektrokardiografie is wêreldwyd 'n essensiële kern uittree-vlak bevoegdheid van voorgraadse mediese programme. Alhoewel 'n uitkomsgebaseerde kurrikulum by die UV Mediese Skool in 2000 ingestel is, kan sekere aspekte van bevoegdheid-gebaseerde onderrig (soos die registrasie en interpretasie van 'n elektrokardiogram) aangepas word en ingesluit word by uitkoms-gebaseerde kurrikulums.

Voor die aanvang van hierdie studie het 'n voorlopige literatuur-oorsig aangetoon dat min navorsing uitgevoer was ten opsigte van die gebruik van elektrokardiografie, as onderrigtaak in gemeenskapsomgewings, in die prekliniese fase van mediese kurrikulums.

Die breë eindoel van die studie was om die oorgang tussen elektrokardiografie onderrig en leer in die prekliniese en kliniese fases van die UV mediese kurrikulum te fasiliteer.

Die probleem, wat die navorsing se aanvang gestimuleer het, was dat meer inligting benodig is ten opsigte van die praktiese uitvoerbaarheid van die implementering van elektrokardiografie onderrig en leer in gemeenskapsomgewings gedurende semesters vier en vyf van die UV voorgraadse M.B.,Ch.B. kurrikulum.

Om die probleem aan te spreek, is twee navorsingsvrae geformuleer ten opsigte van die generiese, konteks-spesifieke en taakspesifieke aspekte wat besluite ten opsigte van die uitvoerbaarheid van die implementering van gemeenskapsgebaseerde take in die prekliniese fase van 'n Suid-Afrikaanse voorgraadse M.B.,Ch.B. kurrikulum beïnvloed, asook die houdings en opinies van 'n doelmatige steekproef van Fakulteitslede ten opsigte van gemeenskapsgebaseerde elektrokardiografie leer in semesters vier en/of vyf.

Om die navorsingsvrae te beantwoord, is twee navorsingsdoelwitte nagestreef ten opsigte van die identifikasie van die hoof aspekte en -uitdagings wat besluite ten opsigte van die uitvoerbaarheid van die implementering van gemeenskapsgebaseerde take in die prekliniese fase van 'n Suid-Afrikaanse voorgraadse M.B.,Ch.B. kurrikulum beïnvloed, en die versameling van toepaslike kwantitatiewe en kwalitatiewe inligting vanaf 'n doelmatige steekproef van personeel by die UV Fakulteit van Gesondheidswetenskappe.

Die eerste deel van die studie het bestaan uit 'n omvattende literatuuroorsig, wat die navorser gehelp het om tersaaklike sleutelaspekte te identifiseer vir gebruik in die onderhoudskedule wat aangewend is vir die empiriese studie.

Die opname is gedoen met die oog op die formulering van 'n effektiewe strategie om die oorgang tussen die elektrokardiografie leer in die prekliniese en kliniese fases van die UV M.B.,Ch.B. kurrikulum te fasiliteer en moontlik vier addisionele ure van gemeenskapsgebaseerde leer in fase II van die kurrikulum in te sluit.

Twee-en-negentig (92) persent van die persone in die doelgerigte steekproef het ingestem om deel te neem aan die studie en 'n loodsstudie is uitgevoer om die betroubaarheid, geldigheid en geloofwaardigheid van die studie te verbeter.

Die data wat deur die onderhoude versamel is, is ge-analiseer en 'n beskrywing en bespreking van die navorsingsbevindinge is gedokumenteer.

Gebaseer op die literatuuroorsig en die response van die persone met wie die onderhoude gevoer is, is verskeie prominente gevolgtrekkings gemaak. Belangrike fakulteits- en gemeenskapsverwante aspekte en uitdagings is geïdentifiseer en die

deelnemers se gunstige response ten opsigte van gemeenskapsgebaseerde leer, taakgebaseerde gemeenskapsgebaseerde leer en gemeenskapsgebaseerde EKG leer in die UV voorgraadse mediese kurrikulum regverdig toekomstige verwante navorsing.

Die deelnemers se response ten opsigte van die praktiese uitvoerbaarheid van die implementering van gemeenskapsgebaseerde EKG leer in die prekliniese fase was matig gunstig en nuttige aanbevelings is gemaak. Van belang ten opsigte van die beplanning van toekomstige navorsingstudies was dat ses-en-twintig persent meer respondente die implementering van gemeenskapsgebaseerde elektrokardiografie-leer gedurende die kliniese fase van die kurrikulum ondersteun het as wat die geval was vir die prekliniese fase.

Hierdie navorsingsbevindings kan van waarde wees by besluite of toekomstige (meer omvattende en potensieel duurder) navorsingsprojekte geregverdig is.

Die toepaslike implementering van elektrokardiografie as gemeenskapsgebaseerde onderrigtaak gedurende die prekliniese en/of kliniese fases kan bydra tot 'n groter mate van gemeenskapsbetrokkenheid en 'n verbetering in die kwaliteit van elektrokardiografie leer in die UV voorgraadse kurrikulum. Dit behoort dus tot voordeel van al die betrokke belanghebbende partye te wees.

# **COMMUNITY-BASED ELECTROCARDIOGRAPY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME**

## **CHAPTER 1**

### **ORIENTATION TO THE STUDY**

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#### **1.1 INTRODUCTION**

The researcher investigated the feasibility of introducing community-based electrocardiography teaching and learning during the preclinical phase of the University of the Free State (UFS) undergraduate medical curriculum. Widespread concern regarding appropriate standards for medical education and the global emphasis on greater civic engagement by higher educational institutions prompted the researcher to perform an in-depth study in this regard. Community-based electrocardiography learning in the preclinical phase of the UFS undergraduate medical curriculum may potentially hold multiple advantages. These advantages include the value of electrocardiography as a diagnostic tool for the early diagnosis of the cardiac complications of common conditions (such as systemic hypertension, diabetes mellitus and obesity) treated at community facilities. However, the feasibility thereof from the point of view of Faculty members, who were in a position to express informed opinions in this regard, had not been explored. In addition, this study could potentially assist with decisions regarding future undergraduate M.B.,Ch.B. curriculum amendments within the UFS Faculty of Health Sciences.

Community-based learning is learning that occurs outside formal higher education institutions (Kaye, Muhwezi, Kazozi, Kijjambu, Mbalinda, Okullo, Nabirye, Oria, Atuyambe, Groves, Burnham, & Mwanika 2011:2) and task-based learning makes use of a specific work-related educational task (Virgo, Holmberg-Marttila & Mattila 2001:55). Electrocardiography learning is a form of task-based learning, but it is also a competency that belongs to one of the eleven main exit level core competencies of South African undergraduate medical education (HPCSA 2010:30-31).



The aim of this chapter is to orientate the reader to the background of the research problem. The following components of the study will be discussed briefly: the problem statement, the research questions, the overall goal of the research, the aim and associated research objectives, the demarcation and scope of the study, and the research design and methodology. A layout of the subsequent chapters and a short summary conclude this chapter.

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

Two national aims stated in The South African Government Gazette (RSA 1997:Online) included the promotion of human resource development through socially responsive programmes (which meet the best standards of academic scholarship) and the demonstration of social responsibility by higher education institutions. This was in accordance with the Education White Paper 3 of South Africa referred to in a Department of Education document (RSA DoE 1997:Online) and in the Council on Higher Education (CHE) Framework for evaluating South African Higher Education, which stated the relevance of community-based higher education in a culturally diverse and modern society (CHE 2004:Online).

The Health Professions Council of South Africa's (HPCSA) Accreditation Report in April 2010 for the UFS's School of Medicine at the Faculty of Health Sciences emphasized the need to increase and enhance community-based education in the undergraduate curriculum (HPCSA 2010:57) and a report of the HPCSA workshop on 22 June 2011 (compiled by the subcommittee for undergraduate education and training) emphasised the need for social accountability of universities. In this report Professor Burch from the University of Cape Town stated that universities need to align curricula content with community needs (HPCSA 2011:14).

In the 1990s, due to technological, pedagogical and knowledge-associated advances and changes in practice environments, most United States medical schools revised their curricula. Especially the first two years were adapted to include more active learning and improve integration of the Basic Medical Sciences and clinical experiences (Lawley, Saxton & Johns 2005:311). In the year 2000, the UFS adapted its undergraduate medical curriculum from a more traditional curriculum (where the Basic Medical Sciences were taught prior to the introduction of more clinical subjects) to a

five-year outcome-based curriculum, with a vertically and horizontally integrated two-and-a-half year preclinical phase.

Although an outcome-based curriculum had been adopted in 2000, the researcher was of the opinion that it would be appropriate to pay attention to certain aspects of competency-based education, for example the performance and interpretation of electrocardiography (an essential exit-level core competency of the undergraduate medical programme). Since 2000, UFS electrocardiography teaching and learning has commenced during semester four (i.e. the second year of undergraduate study), which is part of the preclinical phase of the curriculum (UFS 2013-2014:75). Regarding electrocardiography, a total of 230 minutes of formal didactic teaching and 100 minutes of practical teaching (in the Clinical Skills Unit) are included in semester four. One hour of practical teaching (by the Department of Anaesthesiology) is provided in the Clinical Skills Unit during semester five.

At the University of Dundee in Scotland, Harden and his colleagues formulated a useful framework (the "SPICES model"). SPICES is an acronym for six interrelated educational approaches or strategies, i.e. **S**tudent-centred, **P**roblem-based, **I**ntegrated, **C**ommunity-based, **E**lective and **S**ystematic learning. Decisions pertaining to one strategy may influence those concerning another strategy. This model is appropriate for implementation in developing and developed countries, with the principal aim to produce doctors that are optimally equipped to solve problems related to the particular healthcare needs of the communities they serve. These six "more innovative" educational strategies are regarded to be at the extreme left and opposite end of a continuum, with the more traditional strategies at the extreme right end of the continuum (Harden, Sowden & Dunn 1984:284-285).

The SPICES model can be utilized when planning, developing, evaluating and reforming undergraduate and postgraduate medical curricula, including assessment of students (Karim, Abdulghani & Irfan 2011:27). The researcher was of the opinion that community-based electrocardiography learning (as a foundation for more advanced electrocardiography interpretation at a later stage) could be considered for inclusion in the preclinical phase of undergraduate medical curricula, since it could potentially enhance most of the other educational approaches (with the exception of electives) which constitute the SPICES model, regarding electrocardiography knowledge and skills.

There are multiple problems associated with teaching and learning in community settings. These will be discussed in Chapter 2 (cf. 2.2.4) and include curricular time constraints, placement logistics (such as organizing diverse activities), and contextualisation of didactic material at community sites (Mudarikwa *et al.* 2010:994-995). In the African context adequate physical infrastructure (including piped water and a stable electricity supply) may also impact teaching and learning (Burdick 2007:883).

In order to identify and explore appropriate aspects of teaching and learning that are relevant to the study, the researcher conducted a preliminary literature survey of previous research associated with community-based learning, task-based learning, and electrocardiography-based learning. From the literature that the researcher accessed, it appeared that globally very few research studies had been conducted with regard to electrocardiography as community-based task in the preclinical phase of medical curricula.

### **1.3 PROBLEM STATEMENT AND RESEARCH QUESTIONS**

The problem that was addressed by the research study was that more information was required regarding the practicability of introducing electrocardiography teaching and learning in community-based settings during semesters four and five of the UFS undergraduate M.B.,Ch.B. curriculum. An apparent paucity of recent specific research in this regard (at the commencement of the study) exacerbated this problem. At the commencement of the study, no formal research had been conducted with regard to the perspectives of Faculty personnel who had knowledge and prior experience of community-based learning and/or electrocardiography learning for undergraduate medical students.

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

1. What are the generic, context-specific and task-specific (i.e. electrocardiography) issues that will inform decisions regarding community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum?

2. What are the attitudes and opinions of a purposeful sample of Faculty members who are in a favourable position to provide information with regard to the feasibility of the implementation of community-based electrocardiography during semesters four and five of the UFS undergraduate medical curriculum?

#### **1.4 OVERALL GOAL, AIM AND OBJECTIVES OF THE STUDY**

##### **1.4.1 Overall goal of the study**

The overall goal of the study was to facilitate the transition between electrocardiography teaching and learning in the preclinical and clinical phases of the UFS medical curriculum, in alignment with current HPCSA accreditation standards and benchmarks for undergraduate medical education. This could stimulate further research locally, nationally and internationally and thereby hopefully assist in improving the standard of electrocardiography teaching and learning in medical curricula.

##### **1.4.2 Aim of the study**

The aim of the study was to investigate community-based electrocardiography teaching and learning in semesters four and/or five of the M.B.,Ch.B. programme, as reflected by the views of Faculty members who have the necessary knowledge and experience in this regard.

##### **1.4.3 Objectives of the study**

To achieve the aim, the following objectives were pursued:

- 1 To identify the principal key issues and challenges that would inform decisions regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum (by performing a literature survey). This objective addressed research question 1.
2. To obtain (by conducting structured interviews) quantitative (i.e. numerical) and qualitative (i.e. text) information from:

- a. Personnel in the Faculty of Health Sciences who were directly involved in the administration and implementation of the UFS undergraduate medical curriculum (at the time of the study) in a senior capacity.
- b. Lecturers who (at the time of the study) were module leaders and/or session presenters for semesters four and five modules **or** were involved in community-based learning for the undergraduate programme **or** were at that stage teaching learning content in the preclinical or clinical phases of the undergraduate medical curriculum, that was directly related to the cardiovascular system. This objective addressed research question 2.

By pursuing objectives 1 and 2, the researcher collected data that could assist in establishing the feasibility of introducing community-based electrocardiography teaching and learning in semesters four and five of the UFS undergraduate medical curriculum.

### **1.5 DEMARCATION OF THE FIELD AND SCOPE OF THE STUDY**

This study was conducted in the field of Health Professions Education in the South African context. It lies in the domain of medical academic programme improvement (and specifically undergraduate medical teaching and learning). The focus was on identifying key issues and challenges that could impact the decision to introduce community-based electrocardiography to semesters four and/or five of the UFS undergraduate medical curriculum. The scope of the study was limited to electrocardiography as a particular community-based educational task. The study can be classified as interdisciplinary, since it is applicable to the Basic Medical Sciences, and two disciplines (i.e. Family Medicine and Internal Medicine), which are taught in the clinical phase of the undergraduate medical curriculum.

The results of this study may be used to direct similar studies with regard to undergraduate medical training in the clinical phase and undergraduate training in the Allied Health professions. The study participants in the structured interviews were Faculty members who had specific knowledge and experience with regard to community-based teaching, undergraduate teaching and learning in the preclinical phase of the medical curriculum, and possibly also in undergraduate electrocardiography teaching and learning.

In a personal context and of relevance to this study, the researcher is a qualified medical doctor, with a Master's degree in Family Medicine, who worked at the Critical Care unit of the Universitas Hospital Complex for one year and subsequently taught undergraduate students for a period of fifteen years. The researcher spent twelve years teaching basic electrocardiography skills during semester four of the revised medical curriculum (Curriculum 2000 at the UFS), which is part of the preclinical phase of this curriculum. Consequently the researcher developed a special interest in electrocardiography-related teaching and learning in this phase.

With regard to the time frame, the preliminary (preparatory) phase of the study was conducted from 15 January 2012 until 30 November 2012 and the empirical (practical) component of the research was performed from 1 March until 30 June 2013.

## **1.6 THE VALUE AND SIGNIFICANCE OF THE STUDY**

The study has value at both local and national levels, with regard to undergraduate medical curricula, although the findings may be of interest to educators outside the South African context and also to the Allied Health professions (and in particular the School of Nursing, where the basic elements of electrocardiography are also taught at an undergraduate level).

The research results will provide valuable information with regard to:

1. The identification of important issues that impact decisions regarding the introduction of community-based learning tasks in the preclinical phase of undergraduate M.B.,Ch.B. curricula in South Africa.
2. The opinions and recommendations of selected Faculty members at the UFS's School of Medicine within the Faculty of Health Sciences, with regard to the feasibility of introducing community-based electrocardiography during semesters four and/or five of the UFS undergraduate medical curriculum.
3. The rationale for the allocation of the financial resources that will be required for the implementation of community-based electrocardiography in semesters four and/or five, if it is practicable.
4. Recommendations to the Faculty of Health Sciences regarding decisions pertaining to other community-based tasks in phase II (i.e. semesters two to five) of the undergraduate medical curriculum.

The significance of the study is that it can influence future decisions with regard to introducing electrocardiography teaching and learning in the community in undergraduate medical curricula. The results may also influence decisions regarding electrocardiography teaching and learning in the clinical phase of the medical curriculum and be of special interest to the undergraduate curriculum of the School of Nursing.

## **1.7 THE RESEARCH DESIGN AND METHODS OF INVESTIGATION**

### **1.7.1 The research design**

The principal aspects that were taken into consideration when designing this study were the research objectives, the amount of time available to perform the research, the limited number of potential participants and factors that could influence the reliability, validity and trustworthiness of the research.

According to Delpont and Fouché in De Vos, Strydom, Fouché and Delpont (2011:433), quantitative and qualitative research approaches are not mutually exclusive. Although qualitative research utilises non-statistical methods and small samples (which are often selected with a purpose) and quantitative research is concerned with testing theories (that include variables that are measured numerically and analysed statistically), these approaches can be used in a complementary way.

A cross-sectional survey (i.e. during a specified period), consisting of mainly quantitative and supplementary qualitative elements, (to clarify, corroborate and complement the respondents' answers) was utilised. The survey was mainly descriptive and explanatory in nature (with some analytical and exploratory aspects). Data was collected from a purposeful sample of Faculty members who differed in their occupational designations and occupational experience (cf. Chapter 3 and Appendix I).

The design instrument that was used was a structured interview, which was facilitated by the use of a structured questionnaire that was provided to the participants in advance, to improve the completeness and quality of the data collected and increase the time-effectiveness of the research study. The structured interviews contained mainly quantitative elements (i.e. closed questions) and a limited number of qualitative elements (i.e. open questions). Quantitative and qualitative elements were included to

enhance the quality of the research findings, which may assist in directing subsequent research studies in this regard. The design of the study will be described in more detail in Chapter 3 (cf. 3.3.2 in Chapter 3).

### **1.7.2 The methods of investigation**

The first research method that was utilised and which formed the basis of the study comprised a literature review, which focused on community-based undergraduate teaching and learning in medical curricula, electrocardiography teaching and learning in undergraduate medical curricula and task-based learning in the preclinical phase of medical undergraduate curricula.

According to Boote and Beile (2005:3-4), a literature review provides a contextual and conceptual framework for the envisaged research, reflects research performed by accredited researchers, and describes and evaluates the content thereof, including the relationships between the available literature and the envisaged study.

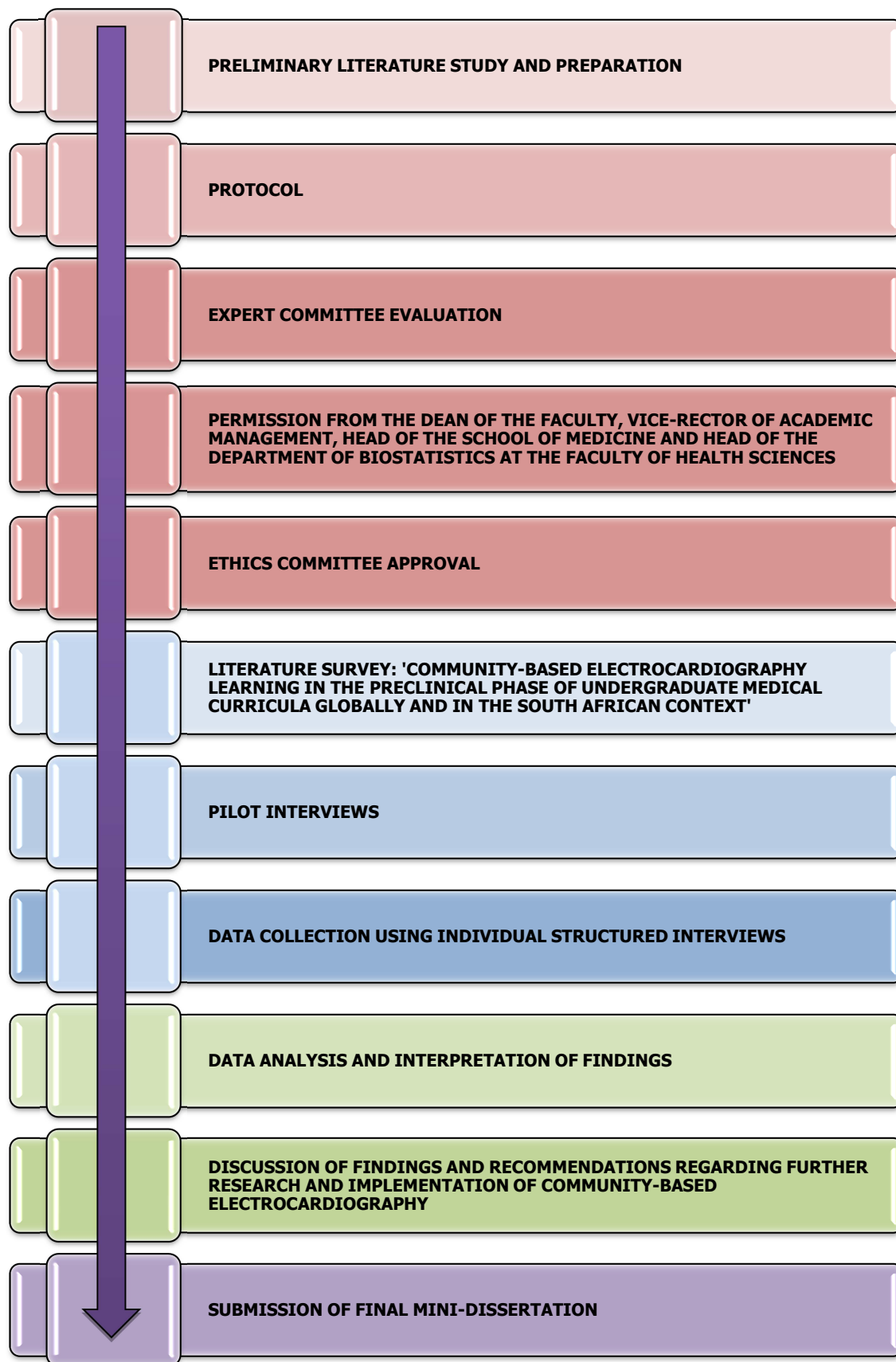
The second method of investigation took the form of individual structured interviews. Structured interview questions are detailed and developed in advance, to ensure consistency (Maree, Creswell, Ebersöhn, Eloff, Ferreira, Ivankova, Jansen, Nieuwenhuis, Pietersen, Plano Clark & Van der Westhuizen 2012:87). Individual structured interviews (utilising closed questions with a limited number of open questions in a predetermined order) were conducted to obtain mainly quantitative (and some qualitative) data from Faculty members who fulfil certain inclusion criteria. An adapted Likert-type scale was used for some of the questions.

According to De Vos, Strydom, Fouché, and Delpont (2011:186), structured interviews are used to obtain information from people who are informed on a particular issue. Purposive sampling was used, as described by Neuman (2012:149), to identify appropriate potential participants for the structured interviews. Purposive sampling is performed (by using prior knowledge to select participants) when in-depth investigation is required regarding a certain issue. According to Creswell and Plano Clark (2011:173-174), purposive sampling in qualitative research means that the researcher intentionally selects participants who have experience regarding the central phenomenon or concept under investigation.



In this study, participants (who differed in their respective occupational designations and levels of seniority) were identified, who would potentially have the necessary knowledge and/or experience with regard to one or more of the principal aspects of the study. A matrix (based on certain selection criteria) was compiled to identify these persons, so that appropriate and useful data could be collected to achieve the aim of the study (cf. Appendix I). A schematic overview of the study is given in Figure 1.1.

A detailed description of the target population, research tools, data collection techniques, data analysis, documentation of the findings, and ethical considerations is provided in Chapter 3.



**FIGURE 1.1: A SCHEMATIC OVERVIEW OF THE STUDY**  
(Compiled by the researcher, Larson 2013)

## 1.8 IMPLEMENTATION OF THE FINDINGS

A comprehensive report containing the research results will be submitted to the Head of the School of Medicine at the UFS Faculty of Health Sciences and the programme director of the undergraduate medical curriculum.

The overall goal of the study was to facilitate a smooth transition between teaching and learning in the preclinical and clinical phases of the UFS undergraduate medical curriculum, with an emphasis on electrocardiography learning. The researcher will therefore endeavour to identify challenges directly related to the feasibility of introducing task-based community-based activities during semesters four and five of the UFS undergraduate medical curriculum.

Since the research findings may stimulate comments and further research locally, nationally and internationally in this regard, the research findings will be submitted to appropriate South African and relevant international academic journals, with a view to publication.

## 1.9 ARRANGEMENT OF THE REPORT

To provide more insight into the topic, the methods used to find solutions and the final outcome of the study will be reported as follows:

In this introductory chapter, **Orientation to the study**, the background of the research problem was provided, with a brief discussion of the main components of the study, the layout of the subsequent chapters and a short concluding summary.

In Chapter 2, **Community-based electrocardiography teaching and learning in undergraduate medical curricula**, the conceptualisation and contextualisation thereof are discussed. Particular attention will be given to task-based teaching and learning, community-based teaching and learning and electrocardiography teaching and learning, with an emphasis on the South African context.

In Chapter 3, **Research design and methodology**, the research design and the methods that were applied will be described in detail. The data collection methods and data analysis will be discussed. The performance, format and content of the structured interview (which was used to obtain the perspectives, opinions and

recommendations of Faculty members with knowledge and experience pertinent to the study) will be described in depth.

In Chapter 4, **Results, analysis and discussion of the quantitative findings of the survey**, the quantitative results of the structured interviews that were used as data collection instrument, will be reported and discussed in a systematic way.

In Chapter 5, **Results, analysis and discussion of the qualitative findings of the survey**, the qualitative results of the structured interviews, will be reported and discussed. These findings include the perspectives of the target population regarding community-based electrocardiography learning.

In Chapter 6, **Conclusions, limitations of the study and recommendations**, an overview of the study, conclusions, limitations of the study and recommendations arising from the research will be provided.

## **1.10 CONCLUSION**

Chapter 1 provided an introduction and background to the research that was undertaken to obtain the views of selected UFS Faculty members regarding the possible implementation of community-based electrocardiography teaching and learning in semesters four and five of the UFS undergraduate medical curriculum.

The next chapter, Chapter 2, titled **Community-based electrocardiography in undergraduate medical curricula**, will provide an evaluation and exposition on literature that is pertinent to the study, to conceptualise and contextualise key aspects pertinent to the study.

## **CHAPTER 2**

### **COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN UNDERGRADUATE MEDICAL CURRICULA**

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#### **2.1 INTRODUCTION**

The value of experiential learning has been recognised since the era of Sophocles almost two and a half millennia ago and, coupled with appropriate feedback, facilitates successful learning in a variety of disciplines (Race 2000:335).

In this chapter community-based electrocardiography teaching and learning will be conceptualised and contextualised, as it applies to undergraduate medical education. The theoretical and conceptual frameworks will clarify (and place into context) key aspects of the study that are pertinent to teaching and learning at the School of Medicine at the University of the Free State's (UFS) Faculty of Health Sciences. For the purposes of this discussion and study the term "teaching" will refer to all learning content related to activities performed by Faculty members who are involved in the training of medical students. The term "learning" will refer to all activities on the part of these students that are related to the acquisition of attitudes, knowledge and skills (or competencies) pertaining to the learning content under discussion.

In traditional medical curricula, a distinction between the preclinical phase (basic sciences) and clinical phase often results in late exposure (e.g. in the third or fourth year) of students to patients (McLean 2004:43). The significance of work-integrated learning (WIL) for students' professional development and employability is widely recognised by the higher education sector and employers (CHE 2011:6) (cf. Chapter 1) Various spheres of student-related benefits have been identified (CHE 2011:6), namely:

1. Academic: e.g. improved general academic performance, interdisciplinary thinking and motivation to learn.

2. Personal: e.g. improved communication skills, leadership, teamwork and co-operation.
3. Career: e.g. professional identity, career clarification, increased employment opportunities, development of positive work values and ethics.
4. Skills: e.g. increased competence as well as technical knowledge and skills.

Breier (2006:25) asserts that a transformation has been necessary regarding education methods to accommodate the continual increase in information and lifelong learning demands of present day occupations. In a document compiled by the South African Ministry of Education in 2001 (Ministry of Education 2001:5) cited by Breier (2006:26), the question is asked how professionals can be produced who not only have globally competitive knowledge and skills, but who are also socially oriented and aware of their responsibility in contributing to national development initiatives and social transformation. This also impacts on social issues, such as the tendency of doctors to emigrate to other countries (Breier 2006:26). It can be postulated that the implementation of curricula that are more responsive to South Africa's unique developmental needs may have a positive effect on this (Breier 2006:26).

Global and national health and social reform objectives concerning primary health care, equity and professional and ethical medical practice are important factors that should be considered when planning and revising medical curricula. In 1998 the World Federation of Medical Education (WFME) recommended exposure of students to a variety of clinical settings as part of generalist (as opposed to specialist) training (McLean 2004:43). In alignment with these recommendations the Health Professions Council of South Africa, which is responsible for the accreditation of medical and dental schools, also recommends appropriate community-based patient exposure (HPCSA 2010:57).

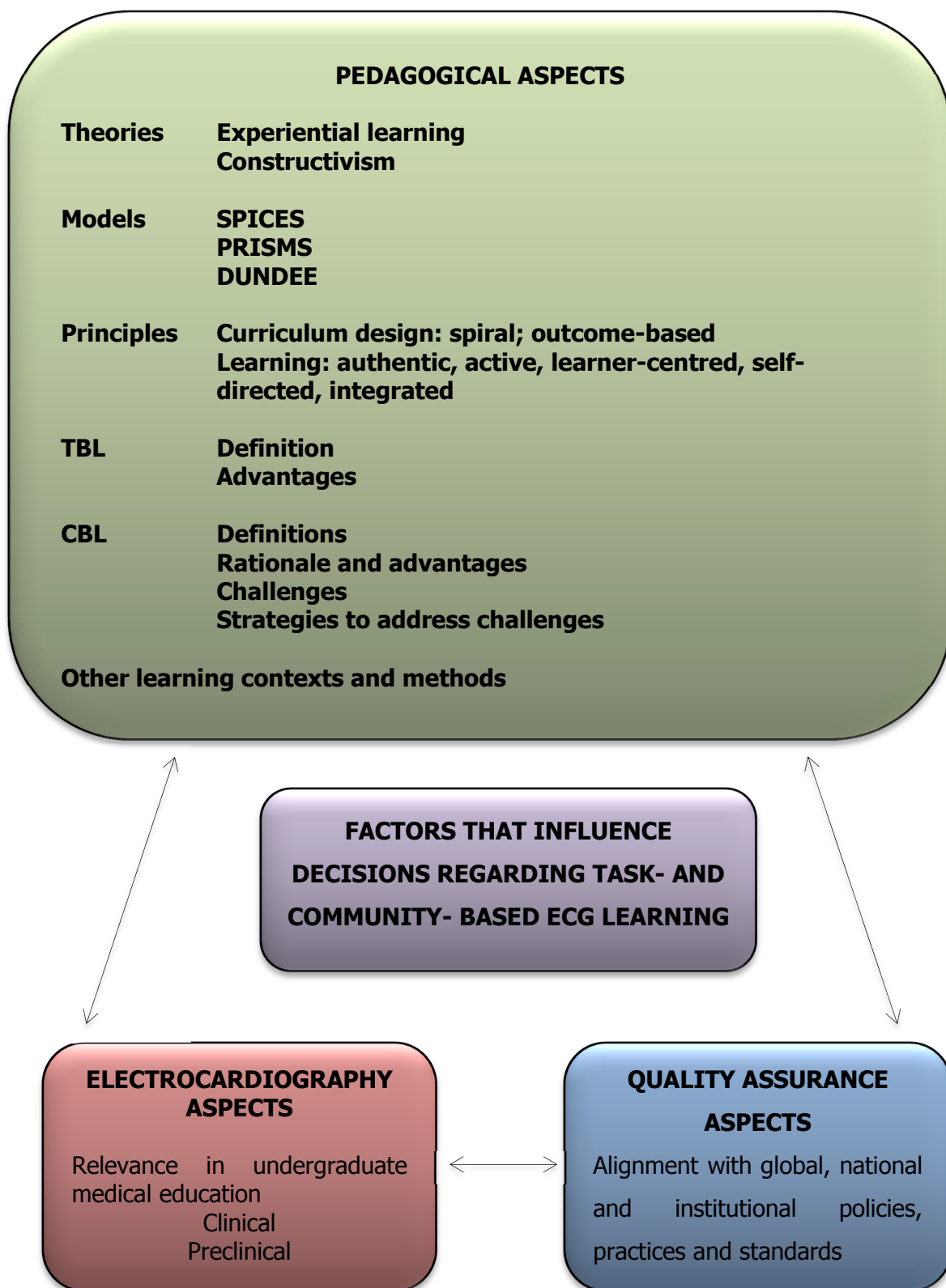
The UFS revised its undergraduate medical curriculum in 2000 in order to be aligned with global and national standards of outcome-based medical education. The international standards initially formulated in a draft document by the World Federation for Medical Education in 1999 (Cohen 2003:950), which were later refined and published in 2003, were an important catalyst in this regard (WFME 2003:Online).

The content of the former six-year undergraduate medical programme was adapted to a five-year curriculum at the UFS, with exit-level outcomes appropriate for a general practitioner as prescribed by guidelines set out by the Medical and Dental Professions Board of the HPCSA in 1999 (HPCSA 1999:1-6). This was done in the form of a spiral curriculum, in which core competencies are taught, with consolidation of the knowledge acquired in previous stages of the curriculum. It was and is therefore important to improve the integration of the knowledge, skills and competencies that students acquire in the preclinical and clinical phases of the UFS undergraduate medical curriculum, respectively.

The following key aspects will be discussed in this chapter:

1. Foundational theories that underpin experiential learning.
2. The relevance of curriculum design, learning outcomes and effective learning for this study.
3. The definition and advantages of task-based teaching and learning.
4. The community as learning environment.
5. Electrocardiography as key competency and task in undergraduate medical education.
6. Community-based electrocardiography learning.
7. The alignment of the current UFS undergraduate medical curriculum (including undergraduate electrocardiography teaching and learning) with global, national and institutional educational policies, practices and standards.

Figure 2.1 provides an outline of the theoretical and conceptual aspects that will be discussed in this chapter. The arrows denote the interdependence of the main aspects.



**FIGURE 2.1: A THEORETICAL FRAMEWORK OF THE STUDY**  
 (Compiled by the researcher, Larson 2013)



## **2.2 PEDAGOGICAL, ELECTROCARDIOGRAPHY AND QUALITY ASSURANCE ASPECTS RELEVANT TO THIS STUDY**

### **2.2.1 Foundational pedagogical theories pertinent to this study**

A number of prominent pedagogical theories, including experiential learning (Kolb 1984:Online), constructivism (Harden, Davis & Crosby 1997:265), the SPICES model (Harden *et al.* 1984:285; cf. Chapter 1), the PRISMS model (Bligh, Prideaux & Parsell 2001:520-521), the three-circle Dundee model (Harden, Crosby, Davis & Friedman 1999:547) and widely acknowledged aspects of adult learning (such as active, authentic and self-directed learning) are of direct relevance to undergraduate electrocardiography learning.

The recording and interpretation of a 12-lead electrocardiogram is a key standard diagnostic procedure that requires the practical application of theoretical knowledge to a particular clinical task. The contexts in which electrocardiography is performed are diverse with regard to the health care disciplines involved, the clinical settings, the availability of resources, the patient characteristics and spectrum of cardiovascular disorders being investigated.

The quality and speed of 12-lead electrocardiographic interpretation requires a high level of confidence and skill on the part of the health professional and is more complex than the 3- or 4-lead electrocardiogram which is normally used to monitor only the regularity of cardiac rate (Alinier, Gordon, Harwood & Hunt 2006:89;91).

O'Brien, Cannarozzi, Torre, Mechaber and Durning (2009:111) state that electrocardiography interpretation is especially important for medical school graduates who pursue careers in internal medicine, emergency medicine, general surgery, and family practice, and the researcher is of the opinion that anaesthesiology can be added to this list. According to O'Brien *et al.* (2009:111), even identification of minor ECG aberrations can have significant clinical implications.

John Dewey, an American educationalist (1859-1952) who is regarded to be the modern philosophical father of experiential learning, believed that the learning process is important. He believed that both the student and society should benefit from any

learning experience and emphasised the link between scholarly engagement and important social issues. Dewey's theory of experiential learning states that a present experience arises from the interaction between two central principles: continuity (which implies that all experiences influence future experiences) and interaction (between a person's current experience and their memories of the past), so that no experience has pre-determined value. Dewey placed a strong emphasis on the necessity of the educationalist to understand the student's past experiences in order to provide a sequence of educational experiences that will enable the person to fulfil their potential as a useful member of society. He asserted that the value of an experience should be judged by its effect on the individual's present, their future and the extent to which the individual can contribute to society (Neill 2005:Online). This theory is important in this study, because the phase of the curriculum and subsequent prior knowledge and experience of students regarding electrocardiography will influence decisions regarding the implementation of electrocardiography learning in a community context.

David Kolb (1984:38) described the steps in the process of experiential learning, i.e. concrete experience, reflective observation, abstract conceptualisation, and active experimentation. These steps can be regarded to be components of a continuous cycle of learning (Kolb 1984:Online). Taking these steps into account, performance of electrocardiography is an appropriate experiential learning task, since different levels of task performance are possible. According to Kolb and Kolb (2005:205,209) experiential learning can be enhanced in higher education by creating appropriate learning spaces aligned with the different potential learning styles of students and a holistic programme of institutional development (which includes curriculum and resource development).

Harden *et al.* (1997:265) regard a constructivist approach (where new and previous learning experiences are linked and previous knowledge is applied) to be a key characteristic of a spiral curriculum. Jean Piaget was one of the persons who proposed the philosophy of constructivism, namely that learners "construct" or formulate their own understanding of new ideas. In trying to understand phenomena, people use knowledge gained from previous experiences and new explorations. Five E's denote stages in this cyclical, open-ended mode of learning, i.e. engage, explore, explain, elaborate and evaluate. This can be adapted to include examine, excite, expand

(extend) and exchange (Miami Museum of Science 2001:Online). The constructivist learning philosophy is directly applicable to this study since it is concerned with learning in different environmental and patient-related contexts, e.g. learning in different community contexts with differing patient profiles (although the particular learning task may not change).

John Biggs (2003:Online) proposes that constructive alignment is an effective approach to curriculum design in the higher education context. The term "constructive alignment" alludes to the principle that a learner constructs his or her own learning (meaning) through appropriate learning activities. The meaning is not directly transmitted from the teacher to the learner. All components in the teaching system (such as the curriculum and its outcomes, the teaching methods and the assessment tasks) should ideally be aligned to each other. The teaching serves as a catalyst for learning, i.e. motivates students to engage in tasks that are likely to enable them to achieve the desired learning outcomes, of which the content and level of understanding are specified. The teacher creates an appropriate learning environment that fosters engagement in outcome-appropriate activities. Ideally, constructive alignment should foster active and higher-order learning. Appropriate assessment tasks (aligned with the learning outcomes and objectives) are then implemented to evaluate the level of attainment of each student regarding the specified learning outcomes. Constructive alignment has direct pedagogical relevance to this study, since decisions regarding community-based electrocardiography learning will be directly influenced by the ability of Faculty to access or create suitable community-based learning environments and align them with the learning outcomes, content and assessment of Faculty-based learning.

According to Bligh *et al.* (2001:520-521), recent significant changes in medical education include the increased use of community-based and small group teaching. A significant number of these changes originated in Harden's SPICES model (Harden *et al.* 1984:284-285). However, there have been significant global changes in academic institutions since the first publication of the SPICES model. These changes include teaching, research and healthcare commitments of educational institutions, increasing student numbers, a greater emphasis on evidence-based medicine and community-appropriate education, and public expectations regarding quality and cost-effectiveness of care (Bligh *et al.* 2001:520). In order to make the necessary adjustments for the

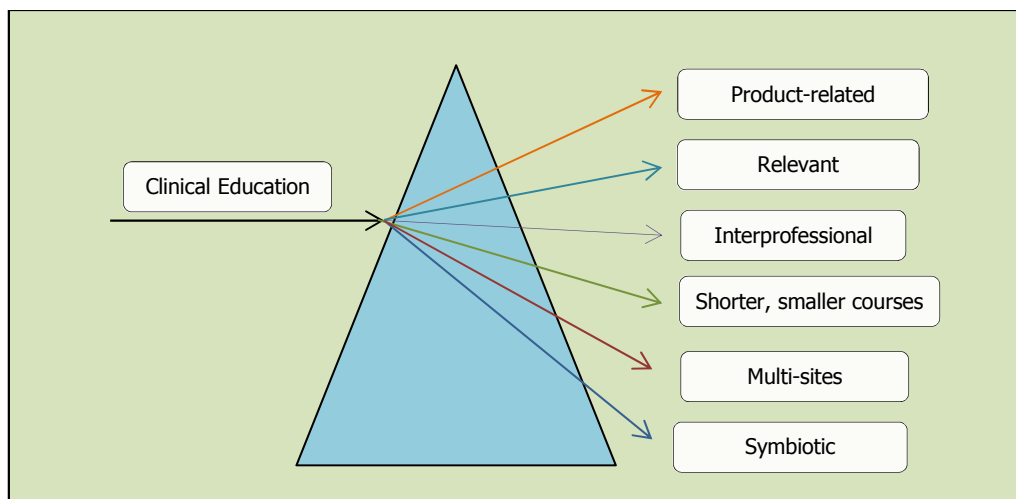
new millennium, Bligh *et al.* (2001:520-521) proposed new guidelines in 2001, (denoted by an acronym, "the PRISMS model") for medical curriculum development.

These guidelines indicate that medical curricula should:

- Be **product-focused** (i.e. practice-based)
- Be **relevant** (to communities and students' future clinical tasks and professional development), which is of direct relevance to this study
- Be **interprofessional** (i.e. include interdisciplinary learning tasks)
- Include **shorter medical courses with smaller student numbers** (which is more applicable to postgraduate learning and therefore not directly relevant to this study)
- Utilise **multi-site locations** (i.e. outside the teaching hospital context, including primary care facilities and other smaller units that cannot accommodate large numbers of students at a time)
- Be **symbiotic** (i.e. function as a dynamic, flexible entity with symbiotically interacting components in partnership)

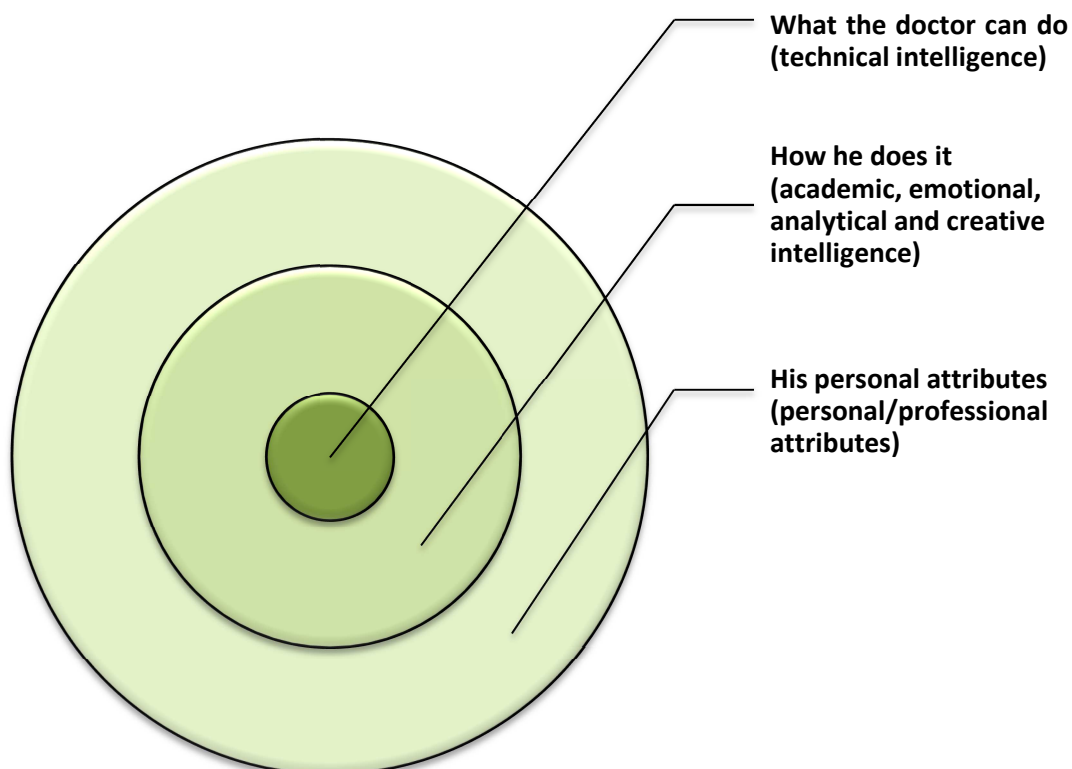
The PRISMS model accommodates different learning styles, a balance between student-centred and teacher-centred learning in the health care system (including community-based learning), practical assessments, and continuous (including formative) assessments such as portfolios (Bligh *et al.* 2001:521).

As indicated by Figure 2.2, adapted by the researcher from Bligh *et al.* (2001:521), clinical education is the driving force for the "symbiotic curriculum", the latter of which is prismatically dispersed into its separate components.



**FIGURE 2.2: THE SYMBIOTIC CURRICULUM OF THE PRISMS MODEL (Bligh *et al.* 2001:521)**

Harden *et al.* (1999:548) proposed a three-circle Dundee model for classifying learning outcomes for undergraduate medical education.



**FIGURE 2.3: THE THREE-CIRCLE DUNDEE MODEL, documented by Harden *et al.* (1999:546-547,550) and adapted by the researcher, Larson 2013**

Electrocardiography, a diagnostic procedure, falls in the innermost circle (technical intelligence) of this model. Many aspects of intellectual intelligence (such as knowledge of normal structure and function, pathophysiology, epidemiology and health economics) are applicable to the middle circle of figure 2.3. Aspects pertaining to emotional intelligence include respect for colleagues and socio-cultural differences as well as ethical standards of practice. Regarding analytical and creative intelligence, optimal use of electrocardiography requires clinical reasoning, decision-making, prioritisation, critical thinking and the ability to cope with uncertainty and ambiguity.

The latter skills, however, are mainly applicable to the clinical phase of undergraduate medicine. Regarding the outer circle of figure 2.3, community-based electrocardiography learning can help students to develop an understanding of their future responsibilities as doctors and members of multi-professional teams and also foster the development of self-confidence, adaptability to changing circumstances, personal time management and initiative.

Learning in community-based settings in the preclinical phase of undergraduate medical education can incorporate certain aspects of the outer circle of figure 2.3, but the overall focus is on the inner and (to a certain extent) middle circles, which involve the mastery of basic technical and academic competencies. Harden (2007b:681) regards the first phase of undergraduate medical education to correspond with the inner circle of the Dundee three-circle model.

In this study the broad outcome domains of the Dundee model and the UFS medical curriculum exit-level outcomes (integrated with the critical cross-field outcomes), as stipulated by the South African Qualifications Authority (SAQA 2013:Online), received consideration. The practical, foundational and reflective competencies related to the SAQA exit-level outcomes that are of particular relevance to this study were also considered. The most important components of these exit-level outcomes, that are directly applicable to this study, are summarised in Table 2.1.

**TABLE 2.1: COMPONENTS, OF THE SAQA EXIT LEVEL OUTCOMES, THAT ARE DIRECTLY APPLICABLE TO THIS STUDY (compiled by the researcher, Larson 2013)**

<b>Subject-related components</b>
Knowledge of human structure and functions
Promotion of health and prevention of illness, disease and injury
Knowledge of the development of diseases and pathology
Diagnosis of illness and disease
<b>Profession-related components</b>
An understanding of medico-legal and ethical principles
Demonstration of knowledge of the ethical and professional standards expected of a doctor
The ability to work as a member of a team

Input was sought from personnel who were involved in teaching the students in semesters four and five (i.e. phase 2) of the UFS undergraduate medical curriculum, personnel with experience of community-based learning and those directly and indirectly involved in teaching electrocardiography during the preclinical and clinical phases of the UFS undergraduate medical curriculum.

In direct relation to the above-mentioned models, McKimm (2009:716) states that vertical and horizontal integration in curricula help students develop a more holistic view of patients' problems. Active reinforcement and assessment at key stages, linked to the acquisition of new knowledge and skills, typify integrated learning. Vertical and horizontal integration (in teaching, learning and assessment) may, however, predispose curricula to the possibility that some topics may be omitted or overtaught. Organisational limitations (such as funding policies) may create barriers to integration and to overcome these challenges close supervision, curricular mapping and effective management are required. McKimm (2009:715) mentions the importance of the learning sequence, i.e. from simple learning units to understanding complex principles in a "spiral curriculum". She states that a learner-centred approach (which emphasises active, constructive and context-related learning) is more resource-intensive, since it relies on smaller groups, requires more preparation and takes the characteristics of individual learners into account.

McKimm (2009:715,717) identifies key aspects (directly pertinent to the planning and execution of this study) which inform decisions regarding appropriate educational methods:

1. Learners' prior knowledge and experience.
2. What the teacher can expect regarding learner knowledge, skills and attitudes.
3. Learners' personal learning needs or difficulties.
4. Whether opportunities have to be included to address unforeseen learning needs.
5. How support will be provided for self-directed learning.
6. Which course content follows the session being taught.
7. Whether the teaching promotes critical thinking on the part of the learners.
8. The venue(s) for learning and the learning opportunities that they provide.
9. The resources (i.e. educational, technical and administrative staff, equipment, funding, media, venues and supervision resources) required for effective education.
10. How the teacher is going to evaluate the effectiveness of his or her teaching, in order to make the necessary adjustments.
11. Whether the educational methods are appropriate for the selected assessment methods.
12. Which constraints affect the educational process.

During the preparatory phase of the study, the above-mentioned aspects, as documented by McKimm (2009:715,717) and Bligh *et al.* (2001:520-521), were taken into consideration for the choice of research methodology. They were categorised and received consideration when the researcher formulated context-specific questions for the structured interviews of the survey.

### **2.2.2 The relevance of curriculum design, learning outcomes and effective learning to this study**

Knowledge transfer to the professional roles (to be performed after graduation) is important and depends on, inter alia, the mastery of certain measurable competencies (Christensen, Karle & Nystrup 2007:673). Because electrocardiography significantly impacts patient management (cf. 2.2.5), the researcher is of the opinion that the performance and interpretation of electrocardiograms is an essential exit-level outcome



that all medical students must acquire irrespective of the curriculum model that is used.

Mukhopadhyay and Smith (2010:790-791) emphasise the distinction between an educational outcome (i.e. what the student should be able to do at the end of a course) and an educational objective (i.e. what a student should have learnt at the end of a course).

Harden (2007a:668) states that education strategies (such as community-based learning) should reflect the learning outcomes. In relation to the present study, this necessitated the consideration of factors that influence the alignment of electrocardiography-related learning activities with the exit-level outcomes of the UFS undergraduate medical curriculum.

According to the objectives of medical education identified by the Health Professions Council of South Africa (HPCSA 2010:30-31), trainees should demonstrate mastery of eleven core competencies, of which the following are directly applicable to this study:

1. "A sound knowledge and understanding of health care, the promotion thereof, and the prevention, management and treatment of disease and injury. Thus knowledge of the normal structure, functions and development of a person as a whole and as an individual within the context of the family and community is required."
2. "The ability to utilise diagnostic aids, as well as the services of allied health professions and to work as a member of a team in rendering health services."
3. "Appropriate attitudes and behaviour patterns to ensure quality health care; a commitment to health care and a responsibility with regard to the physical, mental and social well-being of the community."

According to Harden (2007b:679-680) learners can progress towards exit-level learning outcomes in four dimensions:

- By increasing the breadth of their mastery of a learning objective/outcome "by extending their area of competence to new topics or different practice contexts"

- Due to an increase in the depth of study or level of difficulty (e.g. a more complex, multi-factorial situation)
- Due to increased utility and application to practice (e.g. to a specific medical context where conflicting demands may be present)
- Due to increased proficiency (often reflected by less time required for tasks, attainment of higher standards, evidence of fewer errors and more independent work characterised by more initiative and less supervision)

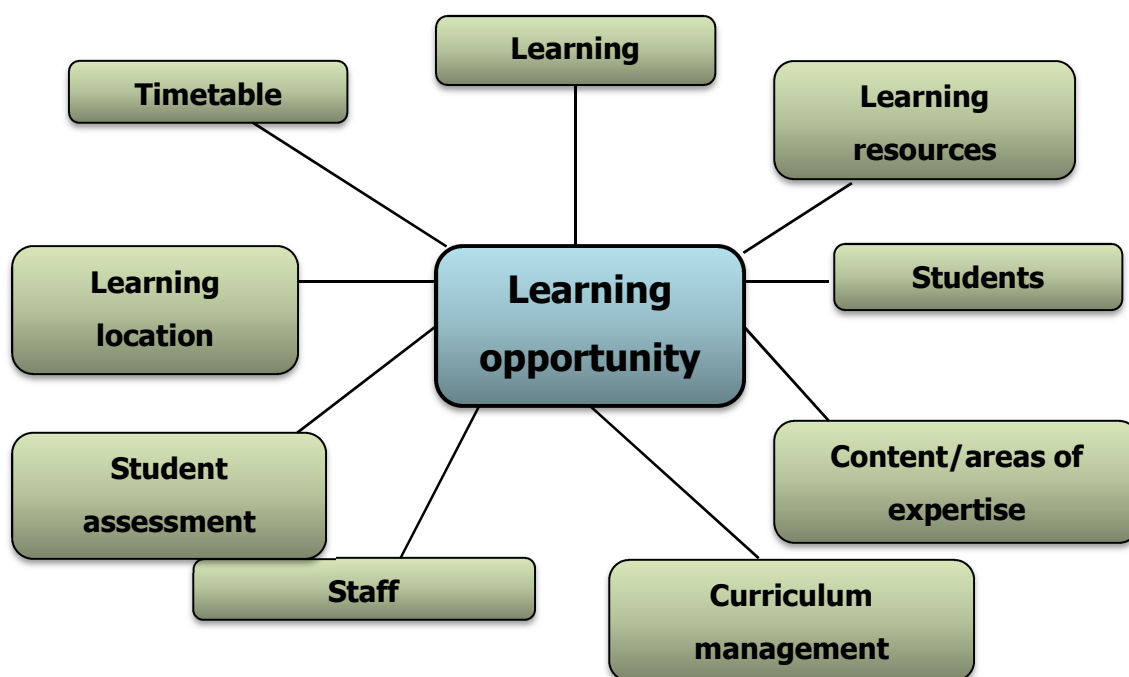
Some of the advantages and challenges of outcome-based curricula cited by Harden *et al.* (1999:551) were taken into account when exploring the most appropriate methodology (and points of investigation) for this research study. When outcome-based curricula are implemented effectively, these advantages include the transparency of the outcomes, consideration of significant exit outcomes, an integrated approach, adaptability to the local context, the role of the basic sciences regarding difficult management decisions and emphasis on the personal development of the doctor. The 'design-down approach' from the exit outcomes to the enabling outcomes (some of which are addressed during semesters four and five) is especially applicable to this study.

The learning outcomes and objectives for electrocardiography education in semester four (as part of the MIS264 and GKV264 modules) have been formulated and revised (UFS 2012:37-77; UFS 2012-2013:52-53,73; UFS 2013-2014:53,75). If community-based electrocardiography learning is introduced, these outcomes and objectives will require minor adjustments since certain learning outcomes and objectives from other MIS264 or GKV264 sessions (such as the taking of a patient history for cardiovascular disorders) may be linked to these outcomes and objectives. This will promote horizontal and vertical integration in the curriculum and ensure optimal use of the time students spend in the community.

A "curricular map" depicts different curricular components and 'units of expertise' with the interrelationships between them (Harden 2001:125;127). Curricular mapping can increase the transparency of medical curricula to all stakeholders, demonstrate links between different curriculum elements, prevent unnecessary repetition in curricula and help inform decisions at different phases of the curriculum (Harden 2001:124-125). Consequently the researcher compiled a mini-curricular map, with reference to

electrocardiography as 'unit of expertise', before selecting the interview questions (cf Chapter 3).

According to Table 2 in Harden (2001:125-126;136), ten key areas can be denoted in a curriculum map, which represent different "windows" or "perspectives" from which the curriculum map can be viewed.



**FIGURE 2.4: A CURRICULAR MAP, adapted by the researcher, Larson 2013, which utilises the ten windows identified by Harden (2001:136)**

A literature review performed using the EBSCOhost Web search engine (from 1995) did not provide detailed global guidelines on current exit-level outcome standards for electrocardiography skills for undergraduate medical education. This reflected a gap with regard to research regarding the required benchmarks, although research has been done on competency levels for electrocardiography interpretation in postgraduate students (Salerno, Alguire & Waxman 2003a:747-750; Salerno, Alguire & Waxman 2003b:751-760).

### **2.2.3 The definition and advantages of task-based teaching and learning**

Task-based learning has been encouraged in medical curricula for more than twenty-five years, with initial emphasis on the use of specific tasks in the clinical phase of undergraduate medical education, to facilitate horizontal and vertical integration (Harden, Laidlaw, Ker & Mitchell 1996:7; Özkan, Degirmenci, Musal, Itil, Akalin, Kilinc, Özkan & Alici 2006:32-33; Virgo *et al.* 2001:55).

Task-based learning (TBL) was first defined by Harden in September 1988. Advantages of TBL for undergraduate education, indicated by Harden, included greater integration between theory and practice and the development of a "reflective practitioner" (Parry 1989:303).

Harden and Davis (1998:319-320) regard TBL to be an advanced step on a continuum of problem-based learning, where the focus is on tasks undertaken by a healthcare professional.

Özkan (2004:279-280) states that TBL can provide a flexible framework for planned education and students can see patients in real-life settings, learn about the tasks, understand the underlying concepts and mechanisms, apply the knowledge and skills in different contexts and acquire general competencies.

Davis (2003:255) describes a task-based educational strategy used for fourth- and fifth-year medical students at the University of Dundee (UK). These tasks are used, *inter alia*, to integrate the basic sciences with the clinical learning in phase 3 (i.e. the final phase) of the curriculum. Tasks were also used in OSCE assessments in year 2, 3 and 4.

A study conducted by Sulaiha, Nurjahan and Nagarajah (2009:Online) indicated that reports by medical students in Malaysia were favourable with regard to small group task-based learning that was implemented in order to improve communication and other interpersonal skills.

Race (2000:336) states that interdependent and interrelated tasks, can be used in assessments, and assist in removing barriers between separate areas of education and

discrete learning elements. According to Race (2000:336), task-based learning can also be cost- and time-effective, if utilised appropriately.

#### **2.2.4 The community as learning environment**

Mennin, Kaufman, Urbina and McGrew (2000:503) state that growing demands on limited acute care resources are necessitating increased delivery of health care in non-hospital settings.

In this study, the researcher will regard a 'community' to be a group of persons in the public sector who share one or more common characteristics, such as residence in a well-defined location or racial or socio-cultural traits.

Community-based education can be regarded to be to learning that occurs in a location outside a higher education institution, where students master professional competencies in settings such as general practices, community health centres, rural hospitals or in community homes (Kaye *et al.* 2011:2).

According to Eldin, Magzoub and Schmidt (2000:699-670) "community-oriented education" refers to health professions education that focuses on priority health issues of local communities, without necessarily utilising community-based activities, as is the case with "community-based education (CBE)". Eldin *et al.* (2000:701) identify three main categories of CBE programmes, namely service-oriented, research-oriented and training focused programmes. Training focused community-based learning will be applicable in this study.

"Community-based learning" is not synonymous with "community service-learning", although all community service-learning is community-based. According to Seifer (1998:274) and Chisholm (2005:343), service learning is a structured community-based learning experience that addresses specific community needs in alignment with definite course-related learning objectives, with an equal balance between the service and learning aspects. In the opinion of the researcher, service-learning (which occurs over an extended period of time) will not be feasible in semesters four or five, due to time and resource constraints. However, many principles pertaining to the

implementation of service learning can be applied to task-based, community-based learning.

The availability of suitably trained staff, financial resources and time allocations of the UFS undergraduate medical programme will influence the extent to which community-based learning can be implemented during semesters four and five of the UFS undergraduate medical curriculum. The researcher is of the opinion that community-based electrocardiography learning can initially be introduced as a task-based community-exposure opportunity of limited duration (e.g. a three-hour session) in the preclinical phase, as mentioned by Eldin *et al.* (2000:706).

According to Kristina, Majoor and Van der Vleuten (2004:510-511), important reasons for community-oriented and community-based medical education include:

1. Differences between the types of patient seen in the clinical phase of undergraduate medical curricula and primary health care facilities and other community settings.
2. Increasing emphasis being placed on public health promotion and prevention of diseases.
3. Inequity in access to health services.

Eldin *et al.* (2000:700,704) and Morrison (2006:92-93) state the following advantages of community-based education:

1. Inequity in service delivery can be addressed, by producing doctors who are willing and equipped to work in underserved communities.
2. Students can learn clinical skills in situations similar to their future work contexts.
3. Community health care services may be commenced to provide students with a learning environment.
4. Students can learn professional skills such as leadership and the ability to work in teams in a more integrated learning environment compared to the more hierarchical structure in tertiary care hospitals.
5. Students can also feel more valued as health care team workers and develop positive attitudes towards paramedical personnel.
6. Medical schools may be strengthened politically, financially and morally.

7. The curriculum can be adjusted to current health care priorities.
8. Opportunities are afforded for partnership between the university, government and community.

Mudarikwa, McDonnell, Whyte, Villanueva, Hill, Hart and Nestel (2010:994-995) identify development of professionalism, real-life mutual learning experiences (that benefit the students and patients), knowledge of the social context of health issues, and interdisciplinary interaction and collaboration as benefits of community-based education.

A systematic review of literature on community-based learning, performed by Dornan, Littlewood, Margolis, Scherpbier, Spencer and Ypinazar in the United Kingdom revealed that early community-based experience helped students to develop empathy towards patients, helped to reduce the stress they experienced during later patient interactions, helped students to manage emotional reactions towards patients, improved their self-confidence, fostered maturity, helped to motivate them by reminding them of their future vocations and provided appropriate role-models. Skills such as interviewing, note-taking, and simple clinical skills (such as measurement of blood pressure) were also learnt. Early experience also supported the students' learning of the biomedical and behavioural/social sciences and helped foster positive attitudes towards primary care and rural practice. This type of learning could also motivate teachers and benefit patients, especially in otherwise underserved populations. Professionalism (which comprises appropriate attitudes towards self, other people and studies, and effective communication and socialisation) was identified to be another important advantage (Dornan, Littlewood, Margolis, Scherpbier, Spencer & Ypinazar 2006:9,13-14).

A consensus survey of the opinions of students and Faculty members at the University of Manchester (Dornan & Bundy 2004:Online) also indicated that early patient contact in the curriculum provided favourable affective outcomes such as an increase in self-confidence, motivation, self-awareness and awareness of others. In this survey (Dornan & Bundy 2004:Online) some students were of the opinion that they would be better equipped to perform ward work. They also thought that they would gain better perspective if they learnt some skills in advance, such as performing an electrocardiogram by using modern machines on patients rather than "ancient machines on peers in the medical school". Staff thought that experience could reflect

that diseases have environmental determinants and that treatment resources are not limitless.

A 5-year problem-based programme, with early patient exposure, was commenced in 2001 at the Nelson R. Mandela School of Medicine (University of Kwazulu-Natal, South Africa). Approximately 95 per cent of first-year medical students reported that their experiences with patients were positive and that the visits provided insight into the daily activities of health care professionals (McLean 2004:46-47).

Igumbor, Del Rio, Buso and Martinez (2006:3), who conducted research at the University of Transkei Medical School, state that students can work effectively in community settings to supplement the work of local health services providers. At the time of publication (2006), second-year medical students spent four weeks (i.e. 11.1 per cent of the total curricular time) and third-year medical students spent six weeks (i.e. 16.7 per cent of their total curricular time) in the community. Students collected useful epidemiological information that could be used for subsequent research and the students, faculty, health centres and community benefited (Igumbor *et al.* 2006:3-4).

The following benefits experienced by the Faculty were mentioned in particular:

- Community-based medical education (CBME) enhanced student-centred learning.
  - CBME helped to identify important areas of research.
  - CBME linked the community with the medical curriculum.
  - CBME increased the number of graduates.
  - The faculty was able to achieve its goals regarding social responsibility.
- (Igumbor *et al.* 2006:4).

At the University Medical Centre in Utrecht, Netherlands, third-year students complete two 6-week clerkships as part of a six-year, vertically integrated, patient-based programme. A study conducted in 2007, using questionnaires, indicated that the majority of students and teachers were positive about the feasibility of early clerkships (Kamalski, Ter Braak, Ten Cate & Borleffs 2007:918-920).

Mudarikwa *et al.* (2010:994-995) conducted a study on community-based learning in first-year medical students at Monash University in Australia. Challenges that were experienced included time constraints, placement logistics, and contextualisation of



didactic material (covered in lectures) at community sites. Goldstein and Bearman (2011:44,48) mention that the demands of medical education and the competition for tenure and promotion among academic physicians may negatively influence community engagement by academic institutions. However, recognition of the scholarship of engagement by universities should help to counteract this.

Burdick, who refers to a United States report of 2007, states that community-based teaching and learning in Africa is associated with several challenges, such as physical infrastructure, including piped water and especially a stable electricity supply. Burdick comments that electricity interruptions may impact communication and the exchange of information between educators, and negatively influence the access of information by medical students (Burdick 2007:883).

In a research study on best practices in community-oriented health professions education, Richards (2001:359-364) identified effective strategies employed by diverse community-oriented educational programmes in a diversity of settings (e.g. rural villages, neighbourhood-based primary care clinics and mobile health care vans).

These strategies included the following:

1. A combination of problem-based and community-based learning.
2. The consideration of the population's priority health needs.
3. Collaborative work with other health professions.
4. Recognition of the connection between contextual (e.g. socio-economic and environmental) problems and health.
5. Health interventions that address local needs.

Other learning contexts and methods such as skills laboratories, simulation units, e-learning, puzzles and games can also be used in undergraduate medical curricula. They can be considered as alternative learning methods, but will not be discussed in detail for the purposes of this study.

The UFS medical school has skills and simulation units that should be taken into consideration when making recommendations regarding the feasibility of implementing community-based electrocardiography learning. Simulated learning environments provide opportunities for deliberate practice (Swing 2010:666). The researcher

therefore decided to investigate whether the research participants were of the opinion that most of the required electrocardiography-related learning outcomes during semesters four and five could be addressed in the skills laboratory in conjunction with the simulation unit. The results of this part of the study were of particular importance, since the implementation of community-based learning involves careful planning and preparation regarding aspects such as transport, patient-related ethics and the impact on the community sites concerned, and it incurs additional costs.

### **2.2.5 Electrocardiography as key competency and task in undergraduate medical education**

Electrocardiography is the measurement of the electrical activity in the heart using a machine called an electrocardiograph (Jevon 2010b:649). The visual recording or display of the patient's heartbeat on paper or on an oscilloscope screen (by placing electrodes on the person's skin) is called an electrocardiogram (Jevon 2010a:34).

Electrocardiography impacts patient management (including emergency, acute and chronic care, preventive medicine, effective interpersonal communication, effective administration of patient records and often specialist referral). It is currently the most commonly utilised procedure that is used to evaluate the cardiovascular status of patients and is regarded to be essential in this regard (Jevon 2010b:649; Kligfield, Gettes, Bailey, Childers, Deal, Hancock, Van Herpen, Kors, Macfarlane, Mirvis, Pahlm, Rautaharju & Wagner 2007:Online).

Many students experience difficulties with electrocardiography interpretation, since an understanding of certain biophysical concepts (such as vector theory) is required and various patient-related aspects also require consideration.

Electrocardiography standards appear to be decreasing, which may cause unwanted consequences for the patient and doctor, and incur unnecessary costs (Crawford & Doherty 2010:622; Jevon 2010b:649). According to Crawford and Doherty (2010:622) the decline in electrocardiogram tracings' quality can be ascribed to, *inter alia*, lead and electrode misplacement, poor technique, lack of theoretical understanding and insufficient exposure to supervised learning opportunities. These issues can, to a significant extent, be addressed with good quality teaching and learning opportunities.

Alinier *et al.* (2006:88) state that electrocardiography should be "practised for real", since lead misplacement can lead to misinterpretation and possible incorrect management of patients. In contrast to learning in authentic settings, traditional (classroom-based) teaching methods do not foster the use of core generic skills in different contexts (defined as the transferability of skills). However, the ethical issues that arise when authentic (real-life) patients are used for educational purposes favour the use of non-patient Faculty-based teaching methods (e.g. simulated patients or the use of fellow students). These ethical issues include informed consent and appropriate management if unsuspected cardiovascular problems are diagnosed or unnecessary stress is experienced in the case of an incorrect diagnosis.

The performance and interpretation of a 12-lead electrocardiography and management of an electrocardiography monitor are included under the measuring and recording category of the learning outcomes for practical procedures compiled by the Scottish Deans' Medical Curriculum Group for the third edition of the Scottish Doctor in alignment with the accreditation standards of the General Medical Council of the United Kingdom (2007:Online). However, no specific standards regarding learning outcomes for the first three years of the Scottish Curricula were stipulated in this document.

Keller and Zakowski (2000:355) document systematic interpretation guidelines that were used at the University of Wisconsin Medical School (USA) for an ECG mini-course developed for use in a community-based primary care clerkship for third-year medical students. Guidelines to determine the cardiac rate, rhythm, intervals, and axis, and to identify myocardial ischaemia and infarcts were included (cf. 2.2.6).

According to Bernstein (1999:159,161) the horizontal and vertical discourse can assist with the analysis of different forms of knowledge that underlie professional competence. Vertical discourse involves a high level of formal, abstract knowledge and horizontal discourse constitutes practical, contextualised knowledge. Both of these forms of discourse are required with regard to competency in the performance of electrocardiography, which requires the direct integration of knowledge of the basic medical sciences with a practical clinical task.

If community-based electrocardiography learning is executable in the preclinical phase of the UFS undergraduate medical curriculum, it will facilitate the transition between the preclinical and clinical phases of this curriculum.

### **2.2.6 Community-based electrocardiography learning**

An extensive literature survey of research performed since 1995 until the present (using EBSCOhost), indicated a paucity of available literature on electrocardiography learning in the community context during the preclinical (Basic Sciences) phase of undergraduate medical curricula. The reason for this may be that there are multiple alternative modes of electrocardiography learning for the preclinical phase of undergraduate medical curricula that may be logistically easier and more cost-effective to implement in the long term. These methods include lectures, workshops and self-directed learning (Mahler, Wolcott, Swoboda, Wang & Arnold 2011:350), computer and internet-assisted learning (Burke, Gnall, Umrudde, Kyaw & Schick 2008:Online; Celikkan, Senuzun, Sari & Sahin 2013:286; Jeffries, Woolf & Linde 2003:72; Romanov & Kuusi 2009:550), simulation and patient role play (Smith, Prybylo & Conner-Kerr 2012:38) and small-group near-peer teaching (Raupach, Hanneforth, Anders, Pukrop, Ten Cate & Harendza 2010:732). Rubinstein, Dhoble and Ferenchock (2009:Online) also performed a pilot study using a puzzle-based learning method.

A good example of community-based ECG learning (involving third-year medical students) that deserves consideration is a mini-course that was introduced during 1995-1996 at the University of Wisconsin Medical School. A self-study manual on basic electrocardiographic skills and three one-hour community-based workshops were used. The approximate average total time to complete the course was six hours. The students who completed the course felt significantly more confident regarding electrocardiogram interpretation and had significantly better mean examination scores than the control group of students who did not do the course (Keller & Zakowski 2000:354).

### **2.2.7 The alignment of the current UFS undergraduate medical curriculum, (including electrocardiography teaching and learning) with global, institutional and national educational policies, practices and standards**

Frenk, Chen, Bhutta, Cohen, Crisp, Evans, and Fineberg (2010:Online) quoted in Van Heerden (2013:21) state that current health profession curricula are not delivering graduates that are optimally prepared for the demands imposed on them due to changing global health requirements.

The vision of the UFS is that it should be recognized for its excellence in academic achievement and human reconciliation across the world. In order to pursue this vision, the mission of the UFS includes setting the highest possible standards for undergraduate education and promoting excellence in the scholarship of research, teaching and public service. The values that underpin these endeavours include superior scholarship and public service, which are directly pertinent to this study (UFS 2013:Online). In order to pursue and achieve this goal, the UFS must strive to align its undergraduate medical curriculum with current global educational ideals, trends and practices.

The UFS Quality Assurance Policy (2009:6,8) states that professional undergraduate and postgraduate programmes are evaluated by the relevant external professional board or body and that quality assurance procedures, as stipulated by the Council on Higher Education, are applied for community service learning.

The UFS Community Service Policy is based on the vision and mission of the UFS to be an excellent, equitable and innovative university. This policy endorses the three tenets required for transformation of higher education in South Africa, i.e. measures to eradicate inequalities, greater responsiveness to diverse social and economic challenges and increased collaboration between all societal role-players (UFS 2006:1). If practicable, community-based electrocardiography will increase the amount of community engagement as is required of tertiary institutions by the Council of Higher Education in South Africa (CHE 2004:Online).

The South African National Qualifications Authority (SAQA) adopted generic critical cross-field educational outcomes for all qualifications at a particular NQF level. These outcomes are regarded to be essential for the development of the capacity for life-long learning (Nkomo 2000:Online). The SAQA critical cross-field outcomes (as cited by Nkomo) that are directly relevant to this study are:

1. "Identify and solve problems in which responses demonstrate that responsible decisions using critical and creative thinking have been made".
2. "Collect, analyse, organise and critically evaluate information".
3. "Use science and technology effectively and critically, showing responsibility towards the environment and health of others".

Van Heerden, the chairperson of the Undergraduate Education and Training (UET) subcommittee of the Medical and Dental Professions Board, asserts that South African training institutions are at least partly accountable for the lack of improvement in the health outcomes of South Africa's population, although multiple factors are involved (Van Heerden 2013:21). According to Van Heerden (2013:21), the key recommendations of a report compiled by Frenk and co-workers include a third level of transformative learning (Frenk *et al.* 2010:Online) that facilitates, *inter alia*, the development of measures that will address the health system deficiencies in collaboration with the relevant stakeholders. Van Heerden emphasises collaboration between the educational and health care systems, regarding medical education, to address the health needs of the nation. The competencies required for undergraduate medical training inform the outcomes, content and design of South African medical curricula. At its first strategic meeting in February 2011, the UET subcommittee of the South African Medical and Dental Professions Board decided to use the report of the Lancet commission as a guide for the future training of South African clinical associates, dentists and medical doctors and to inform future accreditation policies and processes (Van Heerden 2013:22).

On 22 June 2011 senior representatives from all the relevant South African institutions identified the following key elements that should inform the training of these professionals and which will be used for accreditation purposes (Van Heerden 2013:22):

1. Competency driven instructional design.
2. The ability of graduates to work optimally in inter- and transprofessional teams
3. A willingness of training institutions to utilise and share open educational resources.
4. A willingness to engage with other stakeholders in the health and education systems to optimise collaboration (e.g. in joint planning of training and service delivery).

Use of these guidelines will also contribute towards ensuring equity in health care delivery in South Africa.

Global educational policies, practices and standards were formulated by task teams and expert committees elected by international organisations such as the World Federation of Medical Education (WFME 2012:Online), the Institute for International Medical Education (IIME), and the Royal College of Physicians and Surgeons of Canada (CanMEDS 2005:3).

Global competencies can only be used by teachers and students by adding directives (formulated at an institutional, a national and sometimes regional level), to address local needs. The latter depend on epidemiological factors such as the spectrum of diseases, socio-economic and cultural conditions and the status of the health care sector (Christensen *et al.* 2007:672,675). The most recent version of a core competency framework (CanMEDS 2005:3,6) for physicians (first formulated in the 1990s by the Royal College of Physicians and Surgeons of Canada) identifies seven meta-competencies or core roles for physicians. These meta-competencies (Frank & Danoff 2007:644-645) are:

1. Medical expert (as central meta-competency)
2. Communicator
3. Collaborator
4. Manager
5. Health advocate
6. Scholar
7. Professional

The previously mentioned core competencies for medical education of the Health Professions Council of South Africa (HPCSA 2010:30-31) were aligned with the CanMEDS 2005 competencies. The CanMEDS 2005 framework was later adapted by the HPCSA Undergraduate Education and Training (UET) subcommittee for the South African and African context in 2011. It will inform all future HPCSA accreditation processes (Van Heerden 2013:21).

Christensen *et al.* (2007:672-673) indicate that standards in medical education are mainly guided by the World Federation of Medical Education and the Institute for International Medical Education (IIME). Christensen *et al.* document two prominent approaches that are used to develop global standards in medical education:

1. The Trilogy of World Federation of Medical Education (WFME) Global Standards for Quality Improvement (of which the WFME2003a covers basic medical education, i.e. undergraduate medical education). This was subsequently revised in 2012 (WFME 2012:Online).
2. The Global Minimum Essential Requirement (GMER) Standards, produced by the Institute for International Medical Education (IIME).

The WFME standards address aspects of medical education (i.e. the organisation, structure, content, process, environment, management and outcome of medical education) that are directed towards institutions and programmes. For each phase of medical education, they are structured according to nine areas and specify attainment standards at two levels i.e. a. basic standards or minimum requirements and b. standards for quality development, respectively. These standards describe outcomes at nearly the same level of specificity as the IIME standards (Christensen *et al.* 2007:675).

The IIME standards define global minimum essential requirements regarding the outcomes of undergraduate medical education by defining 60 competencies in seven domains that all graduate physicians must demonstrate, irrespective of where the physician was educated (Christensen *et al.* 2007:675).

Cohen (2003:950) regards the IIME and WFME standards to be complementary. This supports the assertion by Christensen *et al.* (2007:672,675) that educational outcomes



(competencies) should not be separated from the curriculum process and content during the curriculum planning phase. Therefore fulfilment of standards requires the measurement of graduates' competencies and the evaluation of instructional methods and contexts.

The literature search, performed by the researcher, revealed few sources (published during the past ten years) regarding specific learning outcomes and objectives for electrocardiography teaching and learning in the preclinical phase of undergraduate medical curricula. This reflects a gap in research and hopefully the findings of this study can help direct further research in this regard. The World Federation of Medical Education did, however, revise their 2003 basic and quality improvement standards for Basic Medical Education in 2012 (WFME 2012:Online), which will impact electrocardiography learning. Two of the 2012 quality development standards that are directly pertinent to this study are "that the medical school should ensure that every student has early patient contact gradually including participation in patient care" and "structure the different components of clinical skills training according to the stage of the study programme" (WFME 2012:Online).

A summary of the key issues and challenges identified from the literature review (and related to the first research question), are presented in Table 2.2.

**TABLE 2.2: KEY ISSUES AND CHALLENGES THAT INFLUENCE THE FEASIBILITY OF IMPLEMENTING CB ECG LEARNING IN SEMESTERS FOUR AND FIVE**

<b>Principal categories</b>	<b>Subcategories</b>	<b>Key issues and challenges</b>
<b>A. Faculty-related issues</b>	<b>1. Faculty policy-related issues</b>	Willingness of training institutions to utilize and share open educational resources  Willingness to collaborate with other stakeholders in the health and education sectors to optimize medical training and service delivery

	<b>2. Sustainable resource-related issues (all of which are dependent on funding)</b>	
	<b>2.1 Faculty personnel-related issues</b>	Availability of competent technical, administrative and medical staff  Time constraints
	<b>2.2 Non Faculty personnel-related issues</b>	Availability of educational media and functional equipment  Availability of cost-effective and reliable transport to community learning sites
	<b>3. Learner-related issues</b>	Learners' prior knowledge, experience and practical skills  Learners' attitudes toward learning and patient care  Learners' individual learning needs and difficulties, including disabilities
	<b>4. Curriculum-related issues</b>	Alignment of curriculum content with current global (including WFME and IIME) and national (including SAQA and HPCSA) educational accreditation standards  A competency-driven instructional design in alignment with international and local meta-core competencies including: <ol style="list-style-type: none"> <li>1. Medical expert (which requires a sound knowledge and understanding of health care, the promotion thereof, and the prevention, management and treatment of disease and injury and the ability to utilize diagnostic aids and the services of allied health professions)</li> <li>2. Communicator</li> <li>3. Collaborator (namely to work as a member of inter- and trans-professional teams in rendering health services)</li> <li>4. Manager</li> <li>5. Health advocate</li> <li>6. Scholar</li> </ol>

		<p>7. Professional 8. Appropriate attitudes and behaviour patterns</p> <p>Appropriately formulated learning outcomes and objectives</p> <p>Alignment of learning activities with the medical curriculum exit-level outcomes and SAQA critical cross-field outcomes, which include critical and creative thinking and the effective use of science and technology</p> <p>Appropriate course content and the chronology thereof, i.e. integration with other modes of learning and curriculum content: horizontal and vertical integration through horizontal and vertical discourse</p> <p>“Early patient contact, gradually including participation in patient care” and “structure the different components of clinical skills training according to the stage of the study programme” (WFME 2012:22)</p> <p>Support provided for self-directed learning</p> <p>Teaching that promotes critical thinking on the part of the learners</p> <p>Informed and objective consideration of the availability of alternative methods, such as skills and simulation units</p>
<b>B. Community-related issues</b>	<b>1. Patient-related issues</b>	<p>Contextual priority health needs that require collaboration between the educational and health care systems</p> <p>Patient-related ethical issues</p>
	<b>2. Location-related issues</b>	<p>Appropriate and available learning venues: personnel and non-personnel logistics</p> <p>Physical infrastructure, including piped water and a stable electricity</p>

		<p>supply (which may impact communication and exchange of information and negatively influence the access of information by medical students and personnel)</p> <p>Contextualisation of didactic material at community sites</p>
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### 2.3 CONCLUSION

In this chapter, a literature review of the key theoretical conceptual and contextual aspects of the study (with important overarching pedagogical factors), is provided. These factors were taken into account when the research method and research instrument were selected and customized by the researcher.

Based on the foundational pedagogical theories and models discussed in this chapter, community-based electrocardiography teaching should be experiential, promote constructive thinking and active and self-directed learning, accommodate different learning styles, be product-focused and relevant to the community needs, interact symbiotically with other curricular components, include interdisciplinary learning tasks, and utilize multiple site locations.

The literature review revealed the most important challenges associated with task-based community-based learning which is therefore a complex form of undergraduate learning.

The literature review also assisted the researcher to formulate appropriate interview questions regarding community-based electrocardiography learning (including the comparison with other cardiovascular community-based learning tasks and the identification of widely acknowledged basic ECG elements that are appropriate for the preclinical phase of medical curricula).

The next chapter, Chapter 3, titled ***Research design and methodology***, will provide a discussion on the research design and methodology of the study.

## **CHAPTER 3**

### **RESEARCH DESIGN AND METHODOLOGY**

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#### **3.1 INTRODUCTION**

As indicated in Chapter 1, the aim of this study was to investigate the practicability of introducing community-based electrocardiography teaching and learning in semesters four and/or five of the UFS M.B.,Ch.B. curriculum. The research question was "Is it practicable to introduce community-based electrocardiography teaching and learning in semesters four and/or five of the UFS M.B.,Ch.B. curriculum?". The focus of this study was medical education research with the emphasis on curriculum design.

This chapter, which deals with the research design and research methodology of the study, begins by elucidating the concept of research, explaining the importance of theory building, and providing theoretical perspectives on the research design and methodology selected for this study. This is followed by a more detailed description and discussion of the literature review pertaining to the research design and methods used by the researcher. Ethical aspects that received attention and measures to improve the trustworthiness of the data are also discussed. The chapter concludes with a discussion on the utilisation of the structured interviews that were conducted in order to collect the appropriate data prior to their analysis and the presentation of the findings. The researcher, to a large extent, applied a positivist approach to the research undertaken, although some elements of the interpretivism approach were necessary due to the qualitative component of the study. A positivist approach is an objective and deductive approach in which the emphasis is on scientific methods of enquiry and where statistical analysis is often used (UWE 2007:Online).

#### **3.2 A DEFINITION OF RESEARCH AND THE PURPOSE AND VALUE THEREOF**

Creswell (2012:3,627) states that research is a cyclical process of steps, used to collect and analyse information in order to increase our understanding of a problem or issue. Three general steps apply: the formulation of the research question, data collection to answer this question and the presentation of this answer.

According to De Vos *et al.* (2011:43) the purpose of research is to resolve practical context-specific problems and to develop a reliable context-specific theoretical base. De Vos *et al.* (2011:46) recommend that applied (practical problem-solving) research and basic (theory-building) research should be conducted in a balanced and complementary way, since basic research generates most of the methods, theories and ideas that practitioners use.

Babbie and Mouton (2012:79-81) state that three useful purposes of social scientific research are exploration, description, and explanation and that a study can have more than one of these purposes. Exploratory studies can, *inter alia*, be used to test the feasibility of performing a more extensive study, to clarify the central concepts and constructs of a study, and to inform decisions regarding subsequent research. Descriptive studies are used to provide an accurate description of phenomena, based on the observations of the researcher. Explanatory studies are used to indicate causality between events or variables.

The value of educational research includes (Creswell 2012:4-6):

1. The expansion of knowledge and resolution of educational issues.
2. Suggestions for the improvement of practice and assistance of educators to evaluate different approaches.
3. The facilitation of connections between educators with similar professional roles.
4. The provision of information that influences the decisions of policy makers.

### **3.3 THEORETICAL PERSPECTIVES ON THE RESEARCH DESIGN AND RESEARCH METHODOLOGY**

#### **3.3.1 Theory-building**

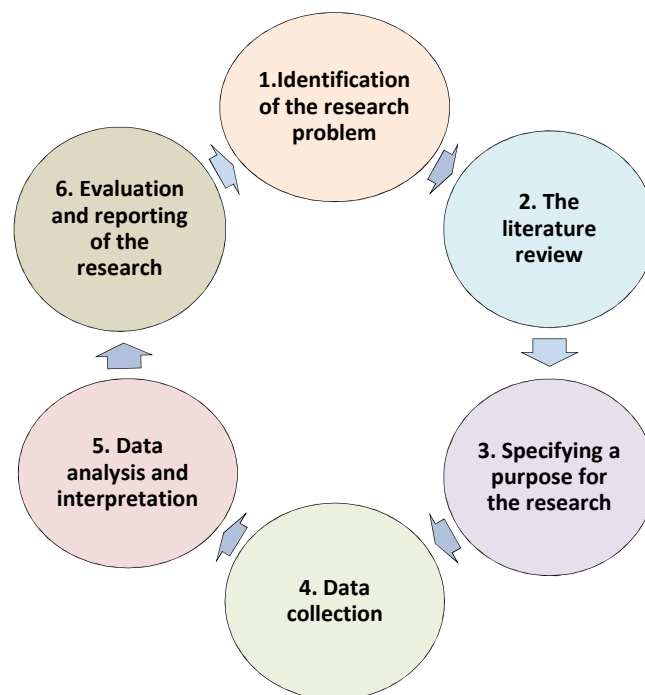
A theory is an organised system of concepts and principles that produces insight and understanding regarding a specific phenomenon, which is supported or not supported by new data (Fox & Bayat 2013:29; Leedy & Ormrod 2010:5).

A theoretical concept is an idea that is thought through, carefully defined, and made explicit in a theory. It is a building block of a theory and can be expressed in words or

as a symbol. It has a symbol (a word, term or written character) and a definition (Neuman 2011:62-63). In this study, the concept "electrocardiography" refers to the performance of an electrocardiogram, which is a diagnostic procedure (cf. Chapter 2 2.2.5). "Community-based teaching and learning" refers to teaching and learning in contexts outside the formal hospital context, such as municipal and mobile clinics.

In order to build theories based on facts, a researcher must think actively and intentionally and formulate possible explanations that involve interrelated concepts and propositions. Often collaboration with others assists with the refinement of theories (Leedy & Ormrod 2010:35).

Research originates with a question or a problem, requires clear articulation of a goal and requires a specific plan for proceeding (Leedy & Ormrod 2010:3). The term "empirical cycle" refers to the successive stages of scientific investigation that form a continuous cycle (Fox & Bayat 2013:22). The research process involves various stages (steps) and is cyclical or helical (spiral-shaped). It often identifies new problems, which start a new cycle (Leedy & Ormrod 2010:6-7). According to Creswell (2012:7) the steps of the research process constitute the "scientific method", as originally indicated by Kerlinger as well as Leedy and Ormrod. The six major steps of the research process cycle are represented by Figure 3.1. It is important to examine each stage of a research study and the related concepts, theories, assumptions, and hypotheses.



**FIGURE 3.1: THE RESEARCH PROCESS CYCLE, adapted by Larson (Creswell 2012:8 Figure 1.2)**

Research problems are issues or difficulties that researchers experience in a practical or theoretical situation and which they need to resolve (Fox & Bayat 2013:22). The statement of the research problem of this study was “More information is required regarding the practicability of possibly implementing electrocardiography teaching and learning in community-based settings during semesters four and five of the undergraduate M.B.,Ch.B. curriculum at the University of the Free State”.

After stating the problem and its related sub-problems, the researcher usually formulates one or more hypotheses. A hypothesis is a prediction, logical supposition, a reasonable guess, or an educated conjecture that provides a possible explanation for a phenomenon being investigated (Leedy & Ormrod 2010:4-5). In many forms of qualitative research hypotheses are intentionally not identified in the early stages of the study and the researcher focuses on the research problem or question. Hypotheses are rarely proved or disproved conclusively. They are rather supported or not supported by an increasing amount of data and then evolve into theories (Leedy & Ormrod 2010:5). In this study no hypotheses were formulated.



All the research questions derived from the research problem should be clearly formulated and from these questions appropriate questions for scientific investigation should be selected by the researcher (Fox & Bayat 2013:23). According to Babbie and Mouton (2012:750), empirical and non-empirical questions can be distinguished. Empirical questions address "real-life" problems and are resolved by collecting new data or analysing existing data. Non-empirical questions include questions about the meaning of concepts and questions about trends or competing theories. Available scientific knowledge is examined to address non-empirical questions.

The researcher formulated the following research questions for investigation:

1. What are the generic, context-specific and task- (i.e. electrocardiography) specific issues that will inform decisions regarding community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum? This is a non-empirical question that could be addressed by conducting a literature review.
2. What are the attitudes and opinions of Faculty members who are in a favourable position to provide information with regard to the feasibility of the implementation of community-based electrocardiography during semesters four and five of the UFS undergraduate medical curriculum? This is a descriptive empirical question that could be addressed by conducting interviews with a purposeful sample of Faculty members who, (based on their qualifications, occupational designations, clinical experience, and current involvement in the implementation of the UFS undergraduate medical curriculum) were regarded by the researcher to have valuable knowledge and experience related to the research topic.

The overall goal of this study was to facilitate the transition between electrocardiography teaching and learning in the preclinical and clinical phases of the curriculum, in alignment with current HPCSA accreditation standards and benchmarks for undergraduate medical education (HPCSA 2011:14-15), by exploring the possibility of introducing community-based teaching and learning during semesters four and/or five of the undergraduate M.B.,Ch.B. curriculum.

The aim of the study was to investigate the practicability of introducing community-based electrocardiography teaching and learning in semesters four and/or five of the M.B.,Ch.B. programme, as reflected by the views of Faculty members who, based on certain inclusion criteria, could be assumed to have the necessary knowledge and experience in this regard.

Research accepts certain critical assumptions or self-evident truths, which are stated by rigorous researchers as the basis of their research (Leedy & Ormrod 2010:5). In this study, the researcher assumed that certain Faculty members, by virtue of their occupational designations and vocational experience, would be in a position to provide valuable information with regard to the two principal research questions.

To achieve the primary aim and address the two principal research questions of the study, the following objectives were formulated and pursued:

1. To identify the principal key issues and challenges that would inform decisions regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum.
2. To obtain quantitative and limited, well-defined qualitative information from:
  - a. Senior personnel of the Faculty of Health Sciences who were directly involved in the administration and implementation of the UFS undergraduate medical curriculum (at the time of the study).
  - b. Lecturers who (at the time of the study) were module leaders and/or session presenters for semesters four and five modules or were involved in community-based or cardiovascular system related learning for the undergraduate medical curriculum. Babbie and Mouton (2012:74-75) make a clear distinction between the concepts "research design" and "research methodology". The research design is a plan of how the researcher intends conducting the research. It focuses on the end-product and the kind of evidence required to answer, the research questions. The research methodology focuses on the individual steps in the research process and the kind of tools and (most objective) procedures to be used.

Research designs are procedures for collecting, analysing, interpreting, and reporting data in research studies. They assist with methodology decisions and provide the logic by which results are interpreted (Creswell & Plano Clark 2011:53). According to Bryman (2012:45-46) a research design is a framework for the collection and analysis of data that is suited to a certain set of criteria and the research question, and a research method is a technique for collecting data.

According to Babbie (2007:107-113), the research design includes:

1. The research idea/problem.
2. The theory pertaining to the study.
3. Conceptualisation of the pertinent concepts and variables.
4. Selection of the research method.
5. Operationalisation (how the variables will be measured).
6. The observations (i.e. the collection of data).
7. Data processing.
8. Data analysis and formulation of conclusions.
9. Application of findings (i.e. the reporting of results and assessment of their implications).

Fouché and Delport in De Vos *et al.* (2011:61,63-65), distinguish between qualitative and quantitative research approaches. The qualitative approach is appropriate when studying complex social phenomena, in order to describe and understand them. Data are normally collected at the site linked to the study question and considerable use is made of inductive reasoning (i.e. moving from the particular to the general). Quantitative research is used to determine the relationships between measured variables, to explain, predict and control phenomena. It involves the use of a standardised procedure to collect numerical data. Deductive reasoning is employed (i.e. moving from the general to the specific). According to Kumar (2005:3), cited in De Vos *et al.*, the quantitative approach is structured and is more appropriate to study the extent of a phenomenon.

According to Delport and Fouché in De Vos *et al.* (2011:433), quantitative and qualitative research approaches are not mutually exclusive. Although qualitative research utilises non-statistical methods and small samples (which are often selected

with a specific purpose) and quantitative research is concerned with testing theories (that include variables that are measured numerically and analysed statistically), these approaches can be used in a complementary way.

Prominent characteristics of quantitative research (Creswell 2012:13) include:

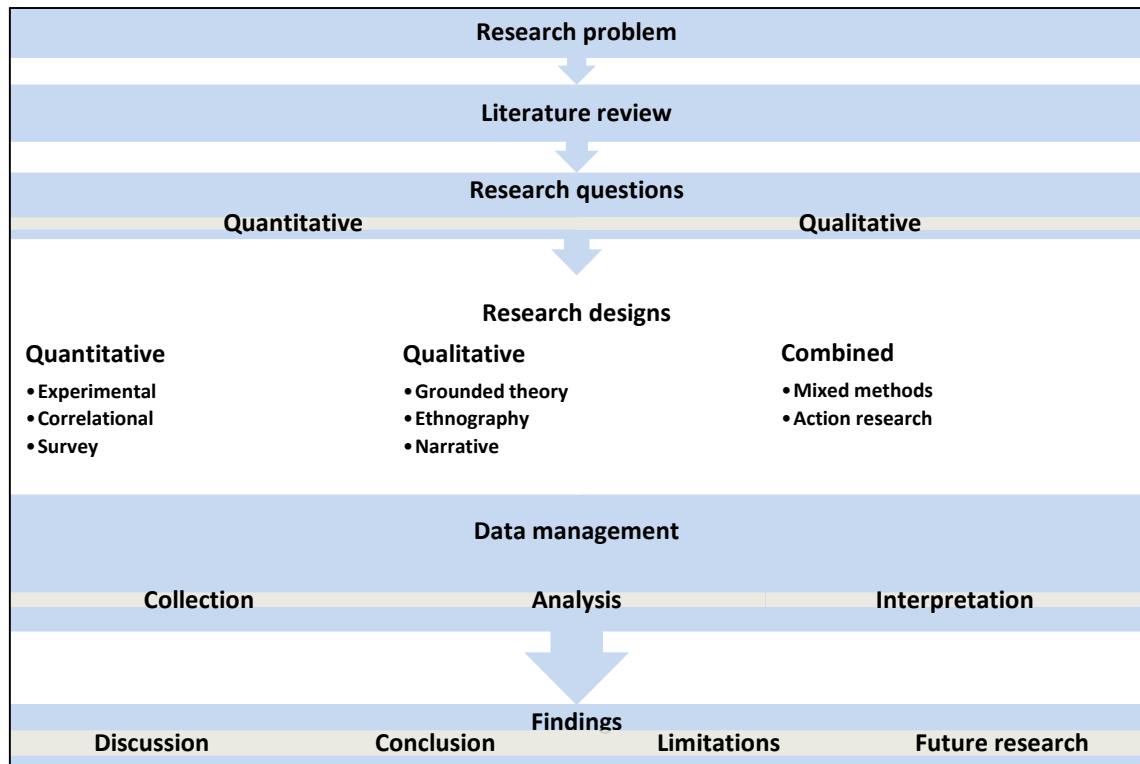
1. The description of trends or the explanation of relationships between variables.
2. The literature plays a major role in the identification of research questions, justification of the research problem and the direction of the study.
3. Specific, narrow, measurable, and observable purpose statements, research questions, and hypotheses are formulated.
4. Numerical data are collected from many people, using instruments with pre-formulated questions and responses.
5. Analysis of trends, comparison of groups and linking of variables using statistical analysis and interpretation of results by comparing them with prior predictions and previous research.
6. Writing the research report using standard, fixed structures and evaluation criteria, and taking an objective, unbiased approach.

Prominent characteristics of qualitative research (Creswell 2012:16-17) include:

1. Exploration of problems and development of a detailed understanding of a central phenomenon.
2. The literature review initially plays a less substantial role, but justifies the problem.
3. Stating the purpose and research questions in a general way, in order to accommodate the participants' responses.
4. Collecting word-based data from a small number of individuals in order to express their views.
5. Data analysis for description and themes, using text analysis.
6. Writing the report, using flexible, emerging structures and evaluative criteria, and including the researchers' subjective views and bias.

Performing educational research includes the major steps of the research process plus designing and documenting the research from a quantitative, qualitative or combined

quantitative/qualitative research perspective. The selection of an appropriate research design is guided by the research problem, questions and literature reviews (Creswell 2012:11). Refer to Figure 3.2 (which illustrates the flow and components of the research process) for the principal quantitative and qualitative research designs.



**FIGURE 3.2: THE FLOW AND COMPONENTS OF THE RESEARCH PROCESS (Creswell 2012:12), adapted by Larson**

In this study mixed methods research was employed. Mixed methods research combines elements of quantitative and qualitative research approaches to enhance breadth and depth of understanding and for corroboration (Johnson, Onwuegbuzie & Turner 2007:Online). The respective strengths and weaknesses of quantitative and qualitative research are also offset by each other in mixed methods research (Creswell & Plano Clark 2011:12).

Delport and Fouché (in De Vos *et al.* 2011:436) summarise the scientific value of mixed methods research, according to various authors:

- The answers to several confirmatory and exploratory questions can be studied and verified simultaneously.
- The weaknesses of qualitative and quantitative research can be limited.
- More comprehensive evidence can be obtained.
- Constructive use of corroborative or conflicting findings between quantitative and qualitative research.
- More perspectives can be considered, which may reveal multifaceted issues.
- The use of multiple paradigms or world views is encouraged.
- Deductive and inductive reasoning processes can be combined.
- Different kinds of bias are eliminated, the true natures of phenomena are explained and the validity of the research is improved.

In contrast to quantitative data, qualitative data provide a more detailed understanding of problems, without the advantage of generalising the findings. This justifies the use of mixed methods research designs in a wide variety of social and health sciences disciplines. The choice of method depends on the research problem/s. A quantitative approach, for example, is best suited to gain an understanding of the individual views of an entire population. A mixed method is appropriate if one data source does not suffice, results require explanation, exploratory findings must be generalised, a primary method needs to be enhanced by a secondary method, a theoretical stance is used, or multiple phases or projects best address a broad research goal (Creswell & Plano Clark 2011:7-8). To enhance understanding, qualitative data can be embedded in a quantitative study (as was applied in this study) or a theoretical stance may justify the concurrent or sequential collection of quantitative and qualitative data (Creswell & Plano Clark 2011:10).

In fixed (as opposed to emergent) mixed methods designs the use of qualitative and quantitative methods is predetermined at the commencement of the research and the procedures are implemented as planned (Creswell & Plano Clark 2011:54).

An appropriate approach for designing the mixed methods study should be selected. The typology-based approach emphasises the classification of useful mixed methods designs and the adaptation of an appropriately selected design (Creswell & Plano Clark 2011:55). According to Creswell and Plano Clark (2011:59) the more complex dynamic approach focuses on a design process that considers the interrelationships between

the study's purpose, the conceptual framework, the research questions, methods and validity factors. Researchers who are inexperienced in mixed methods research should start with a typology-based approach.

### **3.3.2 The research design of this study**

According to Babbie and Mouton (2012:76-79) research designs can be classified according to three main principles: empirical versus non-empirical studies, primary and secondary empirical data and the type of data. The theory of empiricism (as opposed to idealism) states that experience and observation constitute the primary source of all knowledge. Observations made through our senses provide the main data. Data not verified through the senses (e.g. personal insights, mysticism, religious revelation, and metaphysical reflections) are not accepted as scientific. Primary empirical data are those collected by the researcher, as compared to secondary pre-existing data. The data may be numeric (e.g. statistics) or textual (e.g. documents or interview transcripts). Non-empirical and empirical research questions were addressed in this study and were applicable to the first and second methods respectively.

Another design classification principle is the degree of control for sources of error inherent to the design. Structured interviews were used in this study to try and increase the degree of control for sources of error.

Elements of a survey research design were applicable to this study. Surveys are used for descriptive, explanatory and exploratory purposes and usually individual people are used as the units of analysis (Babbie & Mouton 2012:232). Survey research designs are quantitative research procedures in which researchers conduct a survey of a sample or an entire population of people to describe the attitudes, opinions, behaviours or characteristics of the population. Quantitative, numbered data (using questionnaires or interviews) are collected and statistically analysed to describe trends and to test research questions or hypotheses. Survey studies describe trends rather than offer rigorous explanations. The researchers can correlate variables, but the focus is more on learning about a population than on relating variables or predicting outcomes (Creswell 2012:376). According to Fox and Bayat (2013:8), descriptive research is used to investigate issues or problems and facilitate a more comprehensive description of a situation.

Taking into account the advantages of combining quantitative and qualitative research methods and the goal, research problem and questions, aims and objectives of this study, the researcher selected a typology-based concurrent nested (embedded) mixed methods design. The emphasis was on the collection of quantitative information in a cross-sectional survey (i.e. during a specified period). The data collected was mainly descriptive and exploratory in nature, with some explanatory aspects. In the study, in accordance with the views of Delport and Fouché (in De Vos *et al.* 2011:435), additional qualitative data were collected to provide a deeper understanding of the research problem than would have been possible if only quantitative data was collected. The researcher collected numerical and descriptive (text) information, which was integrated, linked and mixed during the research process.

This method and its application within the context of the aim and objectives of this study will now be discussed.

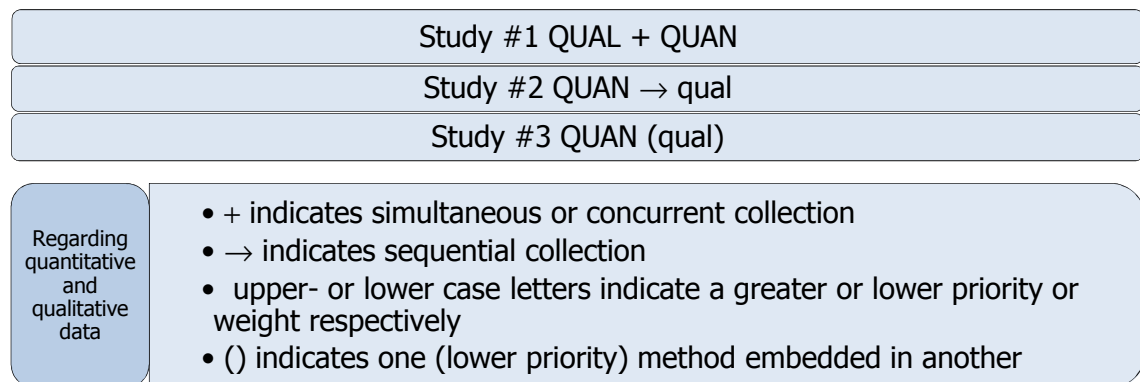
According to Creswell and Plano Clark (2011:71-72), in the embedded design both quantitative and qualitative data are collected and analysed within a traditional dominant quantitative or qualitative design. The supplemental (subordinate) strand enhances the overall design. Creswell and Plano Clark (2011:74) state that the design can be concurrent or sequential, i.e. embedding can occur before, during or after the principal component and the secondary results are used to enhance the planning, understanding or explaining of the dominant strand. One data set can fulfil a secondary, supportive role or the qualitative and quantitative approaches can be combined and embedded in a traditional design (Creswell & Plano Clark 2011:91). Embedded designs can utilise a one-phase or two-phase approach for the embedded strand (Creswell & Plano Clark 2011:92).

The embedded design is used when a single data set is insufficient, since different questions (that require different types of data) need to be answered to fulfil the main purpose of the study. An embedded design is selected and is advantageous when the researcher has limited prior experience of the supplemental method and does not have adequate (time and material) resources to place equal emphasis on qualitative and quantitative data. In contrast to a convergent design, where both methods are used to address a single overarching question, the reasons for including the qualitative data in an embedded design are linked to, but different from the primary purpose (Creswell



& Plano Clark 2011:91;94). Although it can be difficult to integrate the results, the two methods are used to address different research questions and the two sets of results can be kept separate in the research report and can even be reported in separate papers (Creswell & Plano Clark 2011:94-95).

A notation system was developed by Morse in 1991 to illustrate the procedures used in mixed methods designs (Creswell 2012:538). Shorthand labels and upper and lower case letters are used in this system to indicate the time relationships and respective weights of the quantitative and qualitative elements (Figure 3.3). In this study the following notation applies: QUAN (quan).



**FIGURE 3.3: A NOTATION SYSTEM USED FOR MIXED METHODS RESEARCH, adapted by Larson, 2013 (Creswell 2012:538; De Vos *et al.* 2011:440).**

The purpose of the quantitative component of the study was to obtain the knowledge, views, attitudes, beliefs and opinions of Faculty members who, based on certain eligibility criteria, could provide perspectives on important issues identified by the researcher from the literature. The Faculty members differed in their seniority, experience and occupational responsibilities. The purpose of the qualitative component of the study was to identify themes that emerged from participants' elaboration on these key issues, with related in-depth information and to identify any other key issues pertaining to the research topic.

### **3.4 DESCRIPTION OF THE RESEARCH METHODS USED FOR THIS STUDY**

This section provides a description of the methodologies used to achieve each of the two previously stated principal research objectives and the rationale for their selection in the context of this study. The data collection, data analysis, assurance of trustworthiness, validity and reliability and ethical considerations of the research methods will also be discussed.

Two principal research methods were used in this study, i.e.:

1. A focused, yet comprehensive literature review.
2. Structured individual interviews (using closed questions with qualitative open-ended components) with selected personnel in the Faculty of Health Sciences who were directly involved with:
  - a. Teaching in semesters four or five.
  - b. Community-based learning in the undergraduate curriculum.
  - c. Electrocardiography teaching in the undergraduate curriculum.

#### **3.4.1 The literature review and document analysis**

An early and essential step in research is to review the accumulated knowledge on the research question, since scientific research is a collaborative endeavour (Neuman 2011:124). The researcher should know who has previously studied the research problem, since the researcher wants to avoid replicating prior research and the planned research must build on and supplement the existing knowledge on the topic (Creswell 2012:8). Reviewing the literature entails locating a variety of resources on the research topic, selecting appropriate literature for the review and summarising the latter in a written report (Creswell 2012:9).

Four important goals of a literature review (Neuman 2011:124) are:

1. To demonstrate a familiarity with a body of knowledge and establish credibility.
2. To show the path of prior research and how a current study is linked to it.
3. To integrate and summarise what is known in an area.
4. To learn from others and stimulate new ideas.

Different types of literature review vary in scope and depth and the researcher should determine how much time and effort can be devoted to it, the appropriate depth required and the best type of review for the study (Neuman 2011:124). A literature review ideally provides a contextual and conceptual framework for the research and reflects research performed by accredited researchers. The researcher should seek documentation of studies that were valid and unbiased. In this study a context review was performed, as described by Neuman (2011:125) in which the author contextualises the study in a broader framework of knowledge and demonstrates how it builds on a developing line of thought or study.

Boote and Beile (2005:3-4) state that the literature review report should, *inter alia*, describe and evaluate the relationships between the literature and the envisaged study.

According to Maree *et al.* (2012:12), research (especially qualitative research) is iterative, namely the researcher amends the research questions as he or she explores the literature and commences data collection.

In this study, the literature review assisted the researcher to identify the principal research questions, to address the first (non-empirical) research question and to formulate and refine the interview questions. The literature review was directly linked to the achievement of the first principal research objective, i.e. "To identify the principal key issues and challenges that would inform decisions regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum" (cf. 1.4.3 in Chapter 1).

The literature review focused on obtaining information regarding the following key aspects:

1. The alignment of South African undergraduate medical education with global standards.
2. The theoretical and conceptual framework of community-based learning.
3. Community-based learning, in the context of changing educational paradigms and global education standards.

4. Community-based learning in undergraduate medical education, with specific emphasis on the related challenges.
5. Community-based electrocardiography learning in undergraduate medical education, with specific emphasis on the preclinical (early basic sciences) phase.
6. Task-based learning (with an emphasis on undergraduate medical education).
7. Competency-based learning.
8. Electrocardiography in undergraduate education in the global and South African contexts.
9. Electrocardiography learning in undergraduate medical education, with specific emphasis on the preclinical (early basic sciences) phase.

#### **3.4.1.1 *Data collection***

Initially electronic databases and appropriate keywords (community-engaged/based learning/education, undergraduate medical education and electrocardiography) were used to access articles from accredited peer-reviewed international and national journals. EBSCOHost was used extensively with search engines such as Medline, ERIC, Google Scholar, Pubmed and Cinahl. The references cited in appropriate articles were accessed, using the library link for electronic journals of the University of the Free State. The assistance of the Frikk Scott library personnel was also utilised. Books on community-based learning and research methodology were also consulted. Searches were performed for the years 1990 until the present, with an emphasis on publications since 2008. Only articles by renowned authors prior to 1990 were selected for the review.

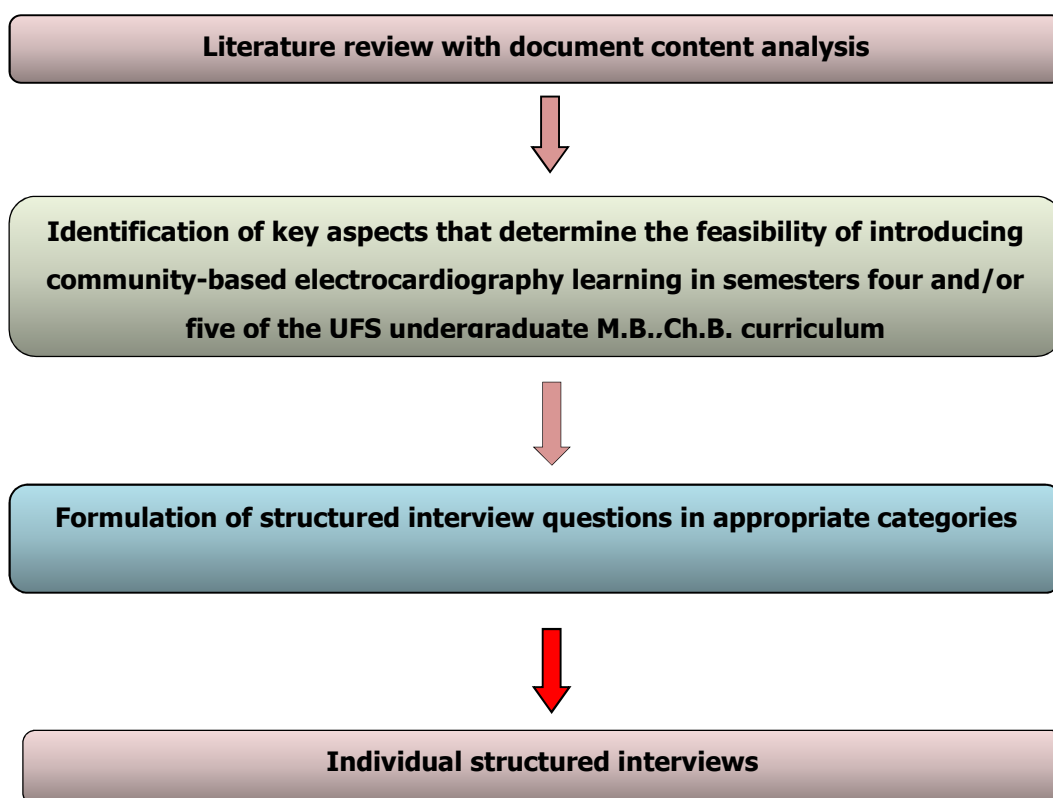
#### **3.4.1.2 *Data analysis***

A document analysis was performed on retrieved literature that the researcher regarded to be directly relevant to the research questions. Only articles from peer-reviewed journals were used. In order to compile the protocol, the researcher initially limited the literature search to literature that was published from 1 January 2008 until 30 November 2012. After the protocol was approved, additional literature published from 1 December 2012 until 30 September 2013 was sought for the completion of the dissertation.

### 3.4.1.3 *Measurement and data interpretation*

Leedy & Ormrod (2010:21-25) assert that most researchers strive for maximum objectivity in their observations and that one strategy that promotes research objectivity is to identify a systematic way of measuring a phenomenon. In research, measurement is an instrument by which data are inspected, analysed, and interpreted, in order to discern the underlying meaning of phenomena. It entails limiting the tangible or intangible data of any phenomenon so that these data may be interpreted (according to certain analysis criteria) and compared to a particular qualitative or quantitative standard. A phenomenon is compared with a point of limitation or reference or a statistical norm or standard. Data analysed qualitatively are compared with regard to data sources, methods and time.

In Figure 3.4 the relationship between the two research methods is presented diagrammatically.



**FIGURE 3.4: A SCHEMATIC OUTLINE OF THE RELATIONSHIP BETWEEN THE TWO RESEARCH METHODS USED IN THIS STUDY (Larson, 2013)**

### **3.4.2 Individual structured interviews**

Individual structured interviews were used in a survey to obtain primary data for the empirical component of the investigation.

#### **3.4.2.1 *Theoretical aspects of individual structured interviews***

Factual information, values, preferences, attitudes, beliefs and the past and present experiences of persons can be obtained directly from participants by interviews (Bless, Higson-Smith & Kagee 2011:118). According to De Vos *et al.* (2011:186) structured interviews are used to obtain information from people who are informed on a particular issue. Structured interview questions are detailed and developed in advance, to ensure consistency (Maree *et al.* 2012:87). Face-to-face interviews have the highest response rates of all types of surveys (Neuman 2012:197). According to Bryman (2012:211) the use of closed-ended questions reduce the potential for interviewer variability and greatly facilitate the processing of data.

Individual structured interviews (utilising closed questions with a limited number of open questions in a predetermined order) were conducted to obtain mainly quantitative (and limited qualitative data) from Faculty members who fulfilled certain inclusion criteria. An adapted Likert-type scale was used for some of the questions (cf. Interview Schedule in Appendix C).

Because quantitative and qualitative data were collected concurrently with a single research instrument and the researcher did not have extensive experience of conducting interviews, the researcher attempted to limit the information that was collected to data that were directly relevant and pertinent to the local context and to keep the research questions as simple and unambiguous as possible.

#### **3.4.2.2 *The use of individual structured interviews in this study***

##### **The sample selection for the individual structured interviews**

A population consists of a group of individuals who possess certain characteristics (De Vos *et al.* 2011:223) or a specific group of sampling units directly linked to the

research question (Maree *et al.* 2012:147). "A sample unit is a unit that will be analysed and upon which measurements or research is performed (Maree *et al.* 2012:146). A sample is a subset of a population (De Vos *et al.* 2011:223).

In this study all available Faculty members (who fulfilled the inclusion criteria as defined by the researcher) were identified as potential participants. These Faculty members were a subset of all the members of the Faculty of Health Sciences (which represented a larger population who did not all fulfil the inclusion criteria). In this study the sample, sample unit, survey population and target population were the same, since no sampling from a larger population was performed.

Neuman (2011:147-151) distinguishes between probability (random) and non-probability (non-random) sampling. One type of non-probability sampling is purposive sampling (Neuman 2012:149). According to Neuman (2011:149;152) purposive sampling is performed (by using prior knowledge to select participants) when in-depth investigation is required regarding a certain issue.

According to Creswell and Plano Clark (2011:173-174), purposive sampling in qualitative research refers to the intentional selection of participants who have experience regarding the central phenomenon or concept being explored. A table of eligibility criteria for purposive sampling (cf. Table 3.1) was used for appropriate selection of the study sample.

### **The target population**

Neuman (2012:151;153) states that the target population is the specific pool of cases/participants you want to include in the study. In this study this was the same as the sample, sample unit and survey population.

During the planning phase of the study a limited number of Faculty members were directly involved in semester four and five training and electrocardiography training in the UFS undergraduate medical curriculum. Consequently sampling criteria were selected in order to collect data on the perspectives of Faculty members directly involved in the UFS undergraduate medical curriculum in different occupational

capacities, but direct involvement in semesters four and five and involvement in electrocardiography training were not essential inclusion criteria.

- **Inclusion criteria:**

Faculty members were selected who fulfilled criterion 1 plus any one of the other criteria (criteria 2 to 5):

1. Staff members with a permanent appointment at the UFS Faculty of Health Sciences for a minimum of five years.
2. Module leaders and/or session presenters for semesters four and five modules, at the time of the study.
3. Staff members involved in community-based teaching and learning during the preclinical and clinical phases of the undergraduate curriculum, at the time of the study.
4. Staff members involved in teaching and learning related to the cardiovascular system in the preclinical or clinical phases of the undergraduate medical curriculum, at the time of the study.
5. Staff members directly involved in the senior management, quality assurance, programme planning or administration of the preclinical phase of the UFS undergraduate M.B.,Ch.B. curriculum at the time of the study.

An alphabetical list (according to surnames) of these Faculty members was compiled (with the assistance of the M.B.,Ch.B. curriculum Phase guide for 2012-2013 and the electronic information on the UFS Staff Intranet). Potential participants were approached in a random order, to ensure anonymity with regard to the documentation and analysis of the data. Table 3.1 reflects the eligibility criteria used.



**TABLE 3.1: ELIGIBILITY CRITERIA APPLIED FOR PURPOSIVE SAMPLING OF FACULTY MEMBERS FOR INDIVIDUAL STRUCTURED INTERVIEWS (Compiled by the researcher Larson, 2013)**

<b>Number</b>	<b>Criterion</b>	<b>Description and motivation for choice of criterion</b>
1.	Faculty member has a permanent appointment at the UFS Faculty of Health Sciences for a minimum of five years	This was an essential criterion, since non-permanent staff members may not be available for an interview or may not have the necessary expertise or interest required for participation in the study. Staff members with a minimum of five years' experience have gained valuable knowledge, experience and insight with regard to the undergraduate UFS M.B.,Ch.B. curriculum
2.	Faculty member is currently a module leader and/or session presenter for semesters four and five modules of the UFS undergraduate medical curriculum	These persons have personal experience and knowledge of the semester four and five modules and the level of student training required

Number	Criterion	Description and motivation for choice of criterion
3.	Faculty member is currently directly involved in the senior management, quality assurance, programme planning or administration of the preclinical phase of the UFS undergraduate M.B.,Ch.B. curriculum	These persons have knowledge and experience regarding the management, quality assurance, programme planning and administration of the UFS undergraduate M.B.,Ch.B. curriculum
4.	Faculty member is currently involved in community-based teaching and learning in the undergraduate UFS M.B.,Ch.B. curriculum	These persons can provide valuable input with regard to community-based undergraduate medical training
5.	Faculty member is currently involved in teaching and learning related to the cardiovascular system in the preclinical or clinical phases of the undergraduate medical curriculum	These persons can provide valuable input with regard to cardiovascular-related (including ECG-related) learning

Staff members had to comply with criterion number 1 plus at least one of the other main eligibility criteria (criteria 2 to 5).

- **Exclusion criteria:**

1. Faculty members who did not fulfil the above-mentioned combination of inclusion criteria at the time of the study.
2. Faculty members who did not provide informed written consent regarding participation in the study.
3. Faculty members who were not located in Bloemfontein during the period of data collection.

The researcher consulted the study leader and two senior lecturers involved in lecturing in semesters four and five of the undergraduate M.B.,Ch.B. curriculum with regard to the selection of the sampling criteria.

### **The sample size**

This comprised the number of Faculty members who fulfilled the above-mentioned selection criteria and gave informed consent to be interviewed. The researcher identified 37 potential respondents, of which 34 gave informed consent to be interviewed.

### **A description of the sample**

The sample corresponded with the target population, as described above.

### **The pilot study**

In order to ensure valid results, the protocol of the study stipulated that data obtained by interviewing the pilot study participants would be excluded from the main study if changes to the study methodology were deemed necessary by the researcher in consultation with the study leaders. Due to the potentially small number of study participants and the fact that the pilot study participants could not be re-interviewed, the formulation and sequence of the interview questions were carefully reviewed by the study leaders and the biostatistician prior to the pilot study. After the protocol was approved by the Ethics Committee of the Faculty of Health Sciences at the UFS, pilot interviews were conducted with two lecturers at the Faculty of Health Sciences who fulfilled the criteria for inclusion in the study.

The pilot study was performed to:

1. Ensure that sufficient time is allocated for communication and consent for participation from potential study participants.
2. Ensure that all relevant questions have been included and the questions are unambiguous, unbiased, and in an appropriate order.
3. Confirm the approximate time required for completion of a structured interview.

As a result of the pilot study, only minor spelling and formatting changes and the updated name of the University of the Transkei (Walter Sisulu University) were required in the interview questionnaires. No changes were required with regard to the

interviewing strategy and the content, formulation and sequence of the interview questions. Therefore the data obtained from the two pilot interviews was included in the data for the main study.

### **Data collection subsequent to the pilot study**

As in the pilot study (2 participants), a detailed letter of invitation and explanation (cf. Appendix A), the interview questionnaire (cf. Appendix C), and consent form (cf. Appendix A) were e-mailed and personally delivered in advance by the researcher to the remaining 35 potential participants. A standard format of all these documents was provided in English or Afrikaans according to the knowledge and discretion of the researcher with the indication that the potential interviewee could request the format in an alternative language, if they preferred. It was not necessary to translate the interview questionnaires into one of the other official South African languages, since all the identified potential participants were proficient in either English or Afrikaans (UFS 2003:4).

The researcher arranged an appointment by e-mail or telephonically with each respondent at a time that suited them. Written informed consent was obtained from all participants prior to the appointment or at the same time as the appointment. An incentive (and token of appreciation) in the form of a gift voucher to the value of R100 (to be redeemed at a popular local bookstore) was used to try and increase the response rate of potential participants. The researcher also attempted to ensure a high response rate by contacting the potential participants electronically, by delivering a hard copy of the letter personally, and by following up the responses of non-respondents within ten days of the delivery of the electronic and hard-copy letters.

Two of the 35 non-pilot study invitees indicated that they were not available to take part in the study, due to personal commitments and time constraints. One invitee was of the opinion that he was not in a position to provide useful input for the study. Inclusive of the pilot study, the researcher therefore obtained consent from thirty-four respondents to conduct an audiotaped, structured interview. In total thirty-one interviews were conducted in Afrikaans and three interviews were conducted in English.

### **3.5 DATA ANALYSIS AND INTERPRETATION**

The Department of Biostatistics at the UFS Faculty of Health Sciences assisted with the compilation and analysis of the quantitative data and the researcher analysed the qualitative (textual) data of the interview transcripts.

Fox and Bayat (2013:106-107) suggest the following systematic approach to analysing textual data (which was adapted for this study):

1. Obtain a holistic view of the data collected.
2. Select one interview or document that appears to be the most interesting, is the shortest one or is the one at the top of the pile.
3. When the data of several respondents has been obtained, list the topics that have emerged.
4. Use this list in conjunction with the data collected from the remaining respondents.
5. Find the most descriptive wording for the identified topics and convert them into appropriately worded topic titles.
6. Make a final decision regarding the abbreviation of each category (topic and subtopics) and arrange these abbreviations/codes in alphabetical order.
7. Group the data belonging to each category and perform a preliminary analysis.
8. If necessary, recode the existing data.

In this study, steps 3 and 4 were combined because the total number of respondents was only 34. The data of all the respondents was examined and compared under each question in the interview schedule, themes/topics were identified with their subthemes/subtopics, codes were formulated and this qualitative data was correlated with the quantitative data.

Analysis of the following broad categories of variables was performed:

1. Demographic data (quantitative data)
2. Experience regarding undergraduate medical education (quantitative data)
3. Knowledge, personal experience, attitudes, beliefs and opinions regarding:

- a. Community-based learning (quantitative and qualitative data)
  - b. Task-based community-based learning (quantitative and qualitative data)
  - c. Electrocardiography learning (quantitative and qualitative data)
  - d. Community-based electrocardiography learning in the preclinical phase of the undergraduate UFS medical curriculum (quantitative and qualitative data)
4. Views and recommendations regarding community-based electrocardiography learning in the UFS undergraduate curriculum (quantitative and qualitative data).

The researcher (in consultation with the study leaders) analysed and interpreted the qualitative data in the above-mentioned broad categories and identified themes under each main category. The researcher then identified categories and subcategories under each theme which were coded and analysed. Finally the researcher correlated the qualitative results with the quantitative results of the research in each category.

The qualitative and quantitative data were integrated in order to formulate conclusions regarding the feasibility of introducing community-based electrocardiography learning in semesters four and five of the undergraduate M.B.,Ch.B. curriculum. Aspects for possible investigation in a subsequent study (because they required further elucidation) were identified by the researcher.

### **3.6 QUALITY ASSURANCE**

Table 3.2 reflects quality assurance criteria that are especially applicable to quantitative and qualitative research.

**TABLE 3.2: ANALOGOUS CRITERIA OF OBJECTIVITY IN QUANTITATIVE AND QUALITATIVE RESEARCH (Babbie & Mouton 2012:276).**

<b>Quantitative</b>	<b>Qualitative</b>
Reliability	Dependability
Internal validity	Credibility
External validity	Transferability
Objectivity	Confirmability

However, according to Bryman (2012:390) the concepts "reliability" and "validity" also apply to qualitative research. External reliability in qualitative research pertains to the degree to which a study can be replicated, which is difficult in social settings. Internal reliability (which is similar to inter-observer consistency) refers to agreement between more than one observer, regarding what they see and hear. Internal validity refers to the relationship between researchers' observations and the theoretical ideas they develop. External validity refers to the extent to which findings can be generalised across social settings.

For the purposes of clarity, important criteria will be discussed with their respective applications to the different research approaches.

### **3.6.1 Trustworthiness**

An overarching principle for quantitative, qualitative and mixed methods research is trustworthiness, which means that the results of the study can be trusted and are worth taking account of (Babbie & Mouton 2012:276). Babbie and Mouton (2012:277) state that purposive sampling (as was employed in this study) enhances trustworthiness, since the range of specific information obtained is maximised by selecting informants that differ with regard to some aspects.

Since no single conclusive account of social reality can be formulated, Bryman (2012:390-393;717) emphasises four criteria (namely credibility, transferability, dependability and confirmability, as advocated by Guba and Lincoln) that determine trustworthiness in qualitative research. These criteria correspond to analogous criteria in quantitative research, as summarised in Table 3.1.

According to Babbie and Mouton (2012:277) transferability is the extent to which the findings can be applied to other contexts or with other respondents. Bryman (2012:390-393) and Babbie and Mouton (2012:277) note that trustworthiness is enhanced by detailed descriptions so that other persons have a reliable database for judging the degree of transferability of findings.

Dependability (a term often used in qualitative research as comparable to reliability in quantitative research) means that evidence is provided that if the research were

repeated with the same or similar subjects in the same (or a similar) context, the findings would be similar. According to Babbie and Mouton (2012:278) a single, properly managed audit (where the relevant documentation of the raw data and the analysis thereof is examined by a separate person) can be used to determine dependability and confirmability simultaneously.

Confirmability deals with objectivity. It indicates the degree to which the findings reflect the focus of the enquiry and not the biases of the researcher due to personal values or theoretical perspectives (Babbie & Mouton 2012:277; Bryman 2012:392-393).

The criteria of objectivity are interdependent: in qualitative research dependability is a prerequisite for credibility, and credibility is a prerequisite for transferability. Credibility implies that there is compatibility between the constructed realities existing in the respondents' minds and the realities attributed to them, i.e. that the data are believable and true. Several procedures enhance credibility, of which triangulation, referential adequacy and member (respondent) checks are applicable to this study (Babbie & Mouton 2012:277).

Triangulation involves the collection of information from different points of view by using different questions, sources and methods. Although only one research instrument was used for the empirical component of the study, including interviewees with different occupational designations provided a form of triangulation (Babbie & Mouton 2012:277).

Referential adequacy pertains to adequate recording of the data. The quantitative data and a limited amount of the qualitative data were concurrently manually recorded on paper with audio-recordings to provide referential adequacy. In member checks, the data and interpretation are checked against the source of information. Bryman (2012:390) also asserts that credibility in qualitative research is ensured by member (respondent) validation, where the researcher reports his findings to respondents to ensure that he interpreted and documented them correctly. This is particularly applicable to interviews, therefore the researcher submitted the transcripts of the qualitative components of the interviews to the participants for verification (validation)



of their responses and also confirmed components of the quantitative data in this way as necessary (Babbie & Mouton 2012:277).

The researcher also checked all the paper-based quantitative data against the audio-recordings and stored the paper-based data in a locked cupboard, in the event that the study leader or any other person would want to check them at a later stage.

Several procedures promoted trustworthiness in this study:

1. The research findings were related to the underlying theory (as described in the literature review). In this study the findings and conclusions related to the empirical investigation (cf. Chapters 4 and 5) were linked to the literature accessed and the theory discussed in Chapter 2.
2. Potential participants were selected according to well-defined inclusion criteria.
3. A carefully constructed interview schedule and audio-recordings (using two audio-recorders), were used.
4. The interview transcripts were made available to the participants and the principal study leader for verification.

Leedy and Ormrod (2010:156-157) list the following further research criteria that have been proposed by experienced researchers regarding the evaluation of qualitative research:

1. Purposefulness, i.e. the research question determines the research methods.
2. Explicitness of assumptions and biases, i.e. the researcher identifies any assumptions, beliefs, values, and biases that may influence data collection and interpretation.
3. Rigour, i.e. the researcher uses precise and thorough methods for all the research steps and strives to remain as objective as possible.
4. Open-mindedness, i.e. the researcher is amenable to amending hypotheses and interpretations in the case of conflicting newly acquired and previously collected data.
5. Completeness, i.e. the researcher provides a detailed description of the phenomenon being studied in all its complexity.

6. Coherence, i.e. the data are linked, multiple data sources converge onto consistent conclusions, and any contradictions within the data are reconciled.
7. Persuasiveness, i.e. logical arguments are presented, and the evidence favours one interpretation to the exclusion of others.
8. Consensus, i.e. other persons (including the study participants and scholars in the discipline) support the researcher's interpretations.
9. Usefulness, i.e. the research provides conclusions that enhance understanding of the research phenomenon, facilitate more accurate predictions, or stimulate beneficial future interventions.

During the planning and execution phases of this study, the researcher was cognisant of a checklist provided by Fox and Bayat (2013:108) that can be used to judge the standard of qualitative research. The researcher regarded the following questions of this checklist to be of special significance for this study, because they can easily be overseen and therefore deserve attention (with direct quotations from the source indicated by quotation marks):

1. "Does the reader gain an understanding of the experiences of the researcher that shape her or his values and biases brought to the research?"
2. "Are the reasons for using the selected data collection procedures stated?"
3. "Are the data analysis steps of coding the information mentioned?"
4. "Are the steps to be taken to verify the information mentioned? Does the reader gain an understanding of the limitations of the qualitative methodologies in terms of generalising and replicating the findings?"
5. "Is the specific outcome of the study mentioned and is it discussed in relation to existing theory and literature?"

Questions 2, 3 and 4 are discussed in this chapter and questions 1 and 5 will be discussed in chapters 5 and 6. Trustworthiness in quantitative research is determined by reliability, internal and external validity and objectivity.

### **3.6.2 Reliability**

Reliability is the extent to which the data collected using a measuring instrument (at different times) are consistent, repeatable and reproducible for the same phenomenon,

sample or different subjects from the same population (Babbie 2007:143; Babbie & Mouton 2012:119; Leedy & Ormrod 2010:29; Maree *et al.* 2012:147,215).

Despite a reliable measuring instrument, reliability does not ensure accuracy, since individual bias may influence the result. Reliability in quantitative research means that the scores received from participants are consistent and stable over time, which must be established before their validity can be assessed. In qualitative research reliability mainly entails the use of multiple researchers in a team to reach consensus on codes for passages in text (Creswell & Plano Clark 2011:211).

According to Babbie and Mouton (2012:120-122) reliability is a concern when a single observer is the source of data, because there is no certain safeguard against the impact of the observer's subjectivity. However, multiple survey researchers may also obtain different answers from respondents due to their own attitudes and demeanours and their coding of data may also differ. Respondents may also interpret questions differently, because they lack knowledge, regard the questions to be irrelevant or do not fully understand the questions. It is therefore important to ask clear and appropriate questions to respondents who will be able to answer the questions, because they have the necessary knowledge and regard them to be relevant. The use of established measures that have proven their reliability in previous research also help ensure reliability. The reliability of data collection by research workers can be improved if a supervisor verifies selected parts of the collected data.

In this study, the embedded mixed method design (with qualitative data embedded in the quantitative data) assisted in elucidating and elaborating on the quantitative data. This enhanced the reliability of the data collected, by providing more detailed explanatory information. The use of a pilot study (to refine the research process and empirical research instrument) and the use of structured interviews with a purposefully selected target population enhanced reliability. The content of the questions for the structured interview schedule were based on well-defined abstract (theoretical) concepts (constructs) identified from the literature. The order, formulation and translation of these questions were checked by the statistician and study leaders to exclude ambiguity and ensure that the questions were aligned to the identified constructs. This also limited the effect that the interpretation of the questions could have on the reliability of the study. The interviews were performed by one interviewer

and the participants were respectfully requested not to discuss their responses with other persons during the period when the interviews were conducted. This limited the effect that the opinions of other participants could have on the data collected. The researcher also made the interview transcripts available to the participants for verification and the supervisor also checked certain parts of the transcripts according to his discretion.

### **3.6.3 Validity**

This is an empirical measure that accurately or adequately reflects the meaning of the phenomenon being investigated (Babbie 2007:146-147; Babbie & Mouton 2012:122) and the "validity" of the instrument used is the extent to which it measures what it should measure (Leedy & Ormrod 2010:28; Maree *et al.* 2012:147).

Mayan cited in Maree *et al.* (2012:305) states that internal validity (credibility) refers to the accurate presentation of a particular context or event as described by the researcher. Internal validity in this study was ensured by basing the interview questions on a comprehensive literature review, by making use of a pilot study, by using a structured interview format, by selecting appropriate criteria for including participants in the study and by obtaining input from two study leaders and a statistician who had experience of mixed methods research.

External validity refers to the degree that the results can be generalised to the entire population (McMillan & Schumacher 2001), cited in Maree *et al.* (2012:151). The researcher consulted international literature to enhance external validity, although this had limited value, since optimal external validity would only have been ensured if experts from other medical schools in South Africa and internationally had been included in the survey. In order to increase the research validity, the researcher also employed measures (such as a tangible incentive in the form of a gift voucher and timeous follow-up after sending out the invitations) to obtain the maximum response rate.

In qualitative research, more emphasis is placed on validity than on reliability, to determine whether the data provided by the researcher and the participants is

accurate and credible (Lincoln & Guba 1985) cited in Creswell & Plano Clark (2011:211).

In general, qualitative validity implies that information obtained from the qualitative data collection is accurate. Qualitative researchers usually use more than one validation procedure. Triangulation and member checking may be employed to achieve trustworthiness and authenticity, which are viable standards for measuring validity and reliability in qualitative research (Creswell & Plano Clark 2011:211-212; Fox & Bayat 2013:107).

Triangulation involves demonstrating convergence or obtaining evidence for a code or theme by using different sources of information (as was applicable to this study), different investigators or different methods of data collection (Creswell & Plano Clark 2011:211-212).

Member checking involves feedback from respondents and includes their validation of the themes, categories or conclusions that were derived from the findings (Creswell & Plano Clark 2011:211-212; Fox & Bayat 2013:107). In this study the interviewees were asked to verify the content of the interview transcripts to validate whether the research findings accurately reflected their experiences.

Persons not affiliated with the study may also provide data validation and even disconfirming information may suggest that the results are valid (Creswell & Plano Clark 2011:212).

Regarding qualitative research, Babbie and Mouton (2012:123) describe criterion-based (predictive) validity, construct validity and content validity. Criterion-based validity is based on an external criterion whereas construct validity is based on the logical relationships amongst variables. Content validity (which is directly applicable to this study) refers to how much a measure covers the range of meanings included in a concept.

### **3.6.4 Authenticity**

Authenticity refers to the extent to which the researcher correctly conveys the participants' experiences. In addition to the above-mentioned four trustworthiness criteria, Bryman (2012:393) describes five criteria of authenticity that were suggested by Lincoln and Guba:

1. Fairness regarding the representation of the viewpoints of different members of the social context.
2. Ontological authenticity which means that the research fosters a better understanding in the members regarding their social environment.
3. Educative authenticity which means that the research fosters a better understanding in the members of the perspectives of other members of their social environment.
4. Catalytic authenticity which means the research has been a catalyst for members to act in order to change their circumstances.
5. Tactical authenticity which means that the research has empowered members to take the steps necessary for engaging in action.

In this study (with regard to fairness and in an attempt to accurately reflect the participants' perspectives), the researcher used direct interviewee quotations (and direct translations of non-English quotations) to support the themes and categories identified. In Chapter 4, these quotations are included under the appropriate themes and categories and the original quotations are provided in Appendix N.

### **3.6.5 Generalizability**

This refers to the extrapolation and application of findings to a larger social context, but research findings can only be generalised to the population from which the sample was taken. Generalisability is also directly related to the external validity of research findings (Bryman 2012:712). Since purposeful sampling was employed in this study and the target population was the same as the purposive sample, generalisation is not applicable to this study. The results of the study were context-specific, although certain generic recommendations regarding community-based electrocardiography teaching and learning in other contexts could be made, taking into account the pedagogical theories (cf. Chapter 2) that are applicable to this study.

### **3.6.6 Quality assurance criteria especially applicable to mixed-methods research**

Legitimizing criteria applicable to mixed methods research will be discussed.

Collins, Onwuegbuzie and Johnson (2012:Online) recommend criteria that can legitimate the conclusions of a mixed research study, so that they are defensible and transparent (i.e. the logic underpinning the research is clarified).

According to Collins *et al.* (2012:Online), these legitimating criteria are influenced by four unique challenges that characterise mixed methods research:

1. Representation, i.e. extraction of adequate meaning from multiple data sources (containing narratives and numbers).
2. Legitimation of inferences, i.e. the acquisition of credible findings and formulation of dependable, transferable inferences from quantitative and qualitative data.
3. Integration, i.e. the degree that the inferences formulated by the researcher in each phase are combined into a “theoretically consistent meta-inference”.
4. Ethics and politics, i.e. the degree to which the conclusions represent a balanced and socially ethical perspective and are deemed viable and useful to interested persons.

Teddlie and Tashakkori (2009:301-302) provide four criteria (Table 3.2) for research-related design quality and six criteria (Table 3.3) for research-related interpretive rigour.

**TABLE 3.3: CRITERIA FOR DESIGN QUALITY, each expressed as a degree and compiled by Larson from Teddlie and Tashakkori (2009:301)**

<b>Criterion</b>	<b>Brief explanation</b>
Design suitability	Suitability for answering the research questions and alignment to the purpose for performing an integrated study
Design fidelity	Quality of execution of the design components and their ability to reflect relationships, etc.
Within-design consistency	Consistently seamless and logical way in which the design components are linked.
Analytic adequacy	Extent to which analysis procedures address the research questions and effectiveness of the analytic strategies.

**TABLE 3.4: CRITERIA FOR INTERPRETIVE RIGOUR, compiled by Larson from Teddlie and Tashakkori (2009:301-302)**

<b>Criterion</b>	<b>Brief explanation</b>
Theoretical consistency	Consistency of inferences with currently available theory and knowledge
Interpretive consistency	Alignment of the "type", "scope" and "intensity" of the findings and related inferences
Interpretive agreement	Likelihood that the same conclusions will be reached by other scholars and their alignment to participants' constructions
Interpretive distinctiveness	Credibility of the inferences, compared to other possible conclusions based on the same results
Interpretive correspondence	Alignment of the inferences of each approach to the research purpose and questions and extent to which the meta-inferences address the mixing purpose of the inquiry
Integrative efficacy	Integration of the inferences to form meta-inferences



Collins *et al.* (2012:Online) state that legitimation in mixed methods research should be holistic (i.e. include the principal generic research quality criteria) and synergistic (i.e. conducted by a team of expert researchers using multiple complementary approaches). This implies that the quality of mixed methods research is dependent on the quality of the qualitative and quantitative components as well as the quality of the integration between them. As a quality criterion, philosophical clarity refers to the degree to which a researcher states his/her philosophical assumptions or stances regarding all components of the research undertaken, because these perspectives inform his/her choices regarding mixed methods research. According to Collins *et al.* (2012:online) different communities of practice use different quality assurance criteria. In this study, which pertains to programme evaluation and educational research, quality criteria (selected from those stated by Collins *et al.* 2012:online) include utility, feasibility, integrity and honesty.

### **3.7 ETHICAL CONSIDERATIONS**

The Belmont Report (US Department of Health, Education, and Welfare 1979:Online) includes three board principles regarding the conduct of biomedical and behavioural research involving human subjects.

These three principles are:

1. Respect for persons so that their autonomy and protection is ensured and participation in research is well-informed and voluntary.
2. Beneficence, so that efforts are made to ensure the well-being of participants, maximise good outcomes and minimise risks.
3. Justice, so that there is a fairness of distribution of benefits and burdens and treatment according to the person's individual context.

This report also states the application of general principles regarding the conduct of research, such as informed consent, risk/benefit assessment and fair participant selection.

Institutional review boards (e.g. ethics committees) of Universities in the United States are bound by law to adhere to these principles (Creswell 2012:22) and in South Africa these three principles are also applicable to educational research.

According to Creswell (2012:23), participants have the right to know the purpose and aims of a study, how the results will be used and the potential social consequences of the research in their individual lives. They also have the right to refuse participation and withdraw at any time. The researcher must also guarantee their anonymity. Excessive financial inducements to participate should not be provided, but participants have the right to benefit, due to the time they sacrificed in order to participate. Creswell (2012:23) comments that ethics should be considered at the beginning of the research planning phase, since ethics are more complex than merely adhering to the guidelines of professional associations or campus institutional review boards. Ethical practices apply to all the steps of the research process, but especially to data collection and reporting and the distribution of the report. It is therefore practical to look at the ethical issues that pertained to each stage of this study.

### **3.7.1 Ethical approval before commencement of the empirical research**

Since UFS personnel acted as participants in this study, approval for the proposed research project was sought (cf. Appendices D to H) and obtained from the Ethics Committee of the University Faculty of Health Sciences, as well as the UFS authorities (i.e. the Dean of the Faculty of Health Sciences, the Vice-Rector of the UFS Academic management and the Head of the School of Medicine). Ethics committees ensure that all planned research projects comply with the three broad aforementioned principles, aligned to the ethics policies of the particular University and discipline-related professional board.

### **3.7.2 Informed consent from participants before commencement of the empirical research**

Verbal and written, signed informed consent (cf. Appendix x) to participate in the study was obtained from all the participants, by making use of explanatory letters and interview schedules that were provided in English (and Afrikaans if necessary). A short description of the study and its purpose, with the interview questions, was provided to

the participants in advance, with an explanation of what was required of them, including details regarding the research process, as applicable. Before the interviews commenced, participants were informed that audio-recordings would be made of the interviews for data verification purposes and that the results of the study would be submitted for potential publication in national and international journals. Participation was voluntary, and the participants were informed in writing that they could withdraw from the study at any time. A written guarantee was provided that all information would remain strictly confidential, except to the researcher and her two supervisors. Contact details of the researcher and the chairman of the ethics committee were provided to participants, so that participants could clarify any aspect of the research that was not clear. The interview schedules were provided in English (and Afrikaans as necessary) to ensure that potential participants were well-informed and understood the purpose and aim of the study and what the researcher intended doing with the results.

### **3.7.3 Ethical practices during data collection: respect for location, clear communication and participant confidentiality**

According to Creswell (2012:23) it is ethical to respect the site at which the research takes place. In this study participants could exercise a choice as to the time and location of the interviews. The researcher tried to be as discreet as possible as to which persons participated in the study, although the inclusion criteria and small number of potential participants limited the extent to which this was possible. The interviews were conducted in English and Afrikaans only, without the use of translation services, since the researcher did not identify any potential participants who were not proficient in either English or Afrikaans.

### **3.7.4 Right to privacy and confidentiality after data collection**

A number coding system was used to ensure the confidentiality of interviewees' responses. Names or personal identifiers did not appear on the data sheets that were sent for statistical analysis of the quantitative data. All personal information was managed with the necessary professionalism and confidentiality, by locking the hard copy of the completed interview questionnaires and interview transcripts in a metal cabinet. All electronic data (which contained no personal identifiers) was stored with the necessary care to avoid access by persons other than the researcher and the two

study leaders. The information provided by the participants during the interviews was not discussed with any third party (other than the study leaders, and then also with the necessary due regard for participant anonymity) during and after the data collection phase.

### **3.7.5 Ethical procedures regarding data analysis**

The researcher used transcripts of the audio-taped interviews to try and prevent potential misinterpretation of the results. The transcripts performed by the researcher were checked by the researcher and submitted to all participants for verification. They were also made available to the principal study leader for random quality assurance checks. The researcher consulted the study leaders and the biostatistician with regard to any aspects that could have been misinterpreted due to the researcher's personal bias or lack of knowledge. Therefore a form of triangulation was employed to assist with the validation of the results.

### **3.7.6 Ethical procedures regarding data reporting**

Creswell (2012:24) states that data should be reported honestly, without altering the findings to satisfy certain predictions or stakeholders. It may be appropriate to provide key persons with preliminary copies of any publications. Plagiarism should be avoided and credit given for information obtained from other studies, by adhering to sound referencing practices. The research documentation should not include culture-specific jargon and should be understandable to the participants. Every effort should be made to communicate the practical importance of the research to interested persons in order to encourage further research, and any unexpected results should be disseminated.

## **3.8 CONCLUSION**

This chapter provided theoretical perspectives on the research design and associated methods used in this study (i.e. a literature review and structured interviews). The chapter concluded by discussing criteria used for assessing the quality of quantitative, qualitative and mixed methods research and important ethical issues pertinent to this study. The results of the quantitative and qualitative components of the empirical research conducted will be presented in Chapters 4 and 5.

## CHAPTER 4

### RESULTS, ANALYSIS AND DISCUSSION OF THE QUANTITATIVE FINDINGS OF THE SURVEY

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#### 4.1 INTRODUCTION

The purpose of this chapter is to present the quantitative results of the structured interviews conducted with a purposive sample of members of the School of Medicine at the Faculty of Health Sciences at the University of the Free State.

In this chapter the answers to the quantitative elements of the following research question (cf. Chapter 1 research question 2) are discussed:

*“What are the attitudes and opinions of a purposeful sample of Faculty members who are in a favourable position to provide information with regard to the feasibility of the implementation of community-based electrocardiography during semesters four and five of the UFS undergraduate medical curriculum?”*

The quantitative component of research question 2 is addressed by a component of the following objective (cf. Chapter 1, objective ii.):

*“To obtain (by conducting structured interviews) quantitative (i.e. numerical) and qualitative (i.e. text) information from:*

- a. personnel in the Faculty of Health Sciences who are directly involved in the administration and implementation of the UFS undergraduate medical curriculum (at the time of the study) in a senior capacity.*
- b. lecturers who (at the time of the study) are module leaders and/or session presenters for semesters four and five modules or are involved in community-based learning for the undergraduate programme or are at this stage teaching learning content in the preclinical or clinical phases of the undergraduate medical curriculum, that is directly related to the cardiovascular system.”*

The interview schedule, which included closed questions in order to obtain quantitative data (cf. Appendix C), was designed to obtain information from Faculty members who were:

1. Directly involved in the administration of the UFS undergraduate medical curriculum in a senior capacity, or
2. Directly involved with or had previous experience regarding one or more of the following:
  - a. Teaching in semesters four or five
  - b. Community-based teaching and learning in the undergraduate medical curriculum
  - c. Electrocardiography teaching and learning in the undergraduate medical curriculum.

Quantitative analysis of the following broad categories of quantitative data was performed:

1. Demographic data
2. Experience regarding undergraduate medical education
3. Faculty members' knowledge, personal experience, attitudes, beliefs and opinions regarding:
  - a. Community-based learning
  - b. Task-based community-based learning
  - c. Electrocardiography learning
  - d. Community-based electrocardiography learning in the preclinical phase of the UFS undergraduate medical curriculum
4. Faculty members' views and recommendations regarding community-based electrocardiography learning in the UFS undergraduate medical curriculum

The principal aim of the quantitative data analysis was to examine the numerical data in the light of the research questions. The researcher then correlated selected numerical data with prominent themes identified from the qualitative data obtained from the interviewees. The interval schedule was structured (with initial sections on the interviewees' personal information which were followed by sections on community-

based, task-based community-based and ECG related learning followed by an open question) to facilitate the analysis of the collected data.

The demographic information of the purposive sample is presented first (cf. 4.3: Demographic description of the sample). This demographic information (derived from Section 1 of the interview schedule) includes biographic data such as gender and age (namely a brief biographic profile), information on where the participants obtained their tertiary education and when they completed their undergraduate tertiary education (namely their educational profile), and their professional qualifications and current occupational roles (namely their professional and employment profile).

The second section of the interview schedule, Section 2 (Appendix C), deals with questions related to the number of years of involvement in undergraduate medical training and current involvement in semesters four and five of the undergraduate medical curriculum (cf. 4.4).

The third section of the interview schedule, Section 3 (Appendix C), deals with questions related to the theoretical knowledge, experience and personal opinions of participants regarding community-based learning in general and also specifically in the preclinical phase of the UFS undergraduate medical curriculum (cf. 4.5).

Section four of the interview schedule (Appendix C) deals with questions related to task-based community-based learning in general and the appropriateness and application thereof in the UFS undergraduate medical curriculum (cf. 4.6).

The fifth section of the interview schedule, Section 5 (Appendix C), deals with questions related to the theoretical and practical knowledge and number of years of experience of participants regarding electrocardiography learning in medical education (cf. 4.7).

Section 6 of the interview schedule (Appendix C) contains questions related to the contextual aspects of electrocardiography learning, including the learning content, the characteristics of suitable lecturers, the application thereof as community-based task, and the necessity, relevance and feasibility of introducing community-based electrocardiography learning in the undergraduate medical curriculum (cf. 4.8). The

results are presented in the form of tables and charts, with a brief discussion after each chart (for clarification). In selected tables, figures and discussions, percentages have been rounded off for the purposes of clarity, but first decimal percentages have been provided where comparisons are presented, due to the small sample sizes. A short overview of the findings concludes this chapter.

#### **4.2 DATA ANALYSIS OF THE STRUCTURED INTERVIEWS: AN OVERVIEW**

The data collection process for the structured interviews is described in Chapter 3 (cf. 3.4.2.2 f) and can be outlined as follows:

1. A letter of invitation and explanation, interview questionnaire and consent form were e-mailed and personally delivered in advance to 37 potential participants, by the researcher.
2. The researcher contacted the non-respondents again, within ten days of the delivery of the electronic and hard-copy letters.
3. The researcher arranged an appointment (telephonically or by e-mail) with each respondent who indicated that he or she was available to participate in the study.
4. Written informed consent was obtained from each participant before the interview commenced (prior to the appointment or at the same time as the appointment).
5. Thirty-one (31) interviews were conducted in Afrikaans and three interviews were conducted in English.
6. The interviews were audio-taped, using two audio-recorders, for the purpose of transcription and quality assurance.
7. The researcher conducted all the interviews personally.
8. The same interview schedule was used for all the interviews (cf. Appendix C).

For the purposes of clarity, as far as was possible, the results have been presented in the order of the questionnaire and in selected tables, the data have been presented as percentages approximated to the first decimal point.

#### **4.3 DEMOGRAPHIC DESCRIPTION OF THE SAMPLE**

Please refer to Section 1 of the interview schedule (Appendix C).



### 4.3.1 The gender distribution of the sample

Table 4.1 indicates the gender distribution of the sample.

**TABLE 4.1: THE GENDER DISTRIBUTION OF THE SAMPLE  
(Question 1.1, Section 1 of the interview schedule) [n=34]**

GENDER	FREQUENCY	PERCENTAGE
Males	21	61.8
Females	13	38.2

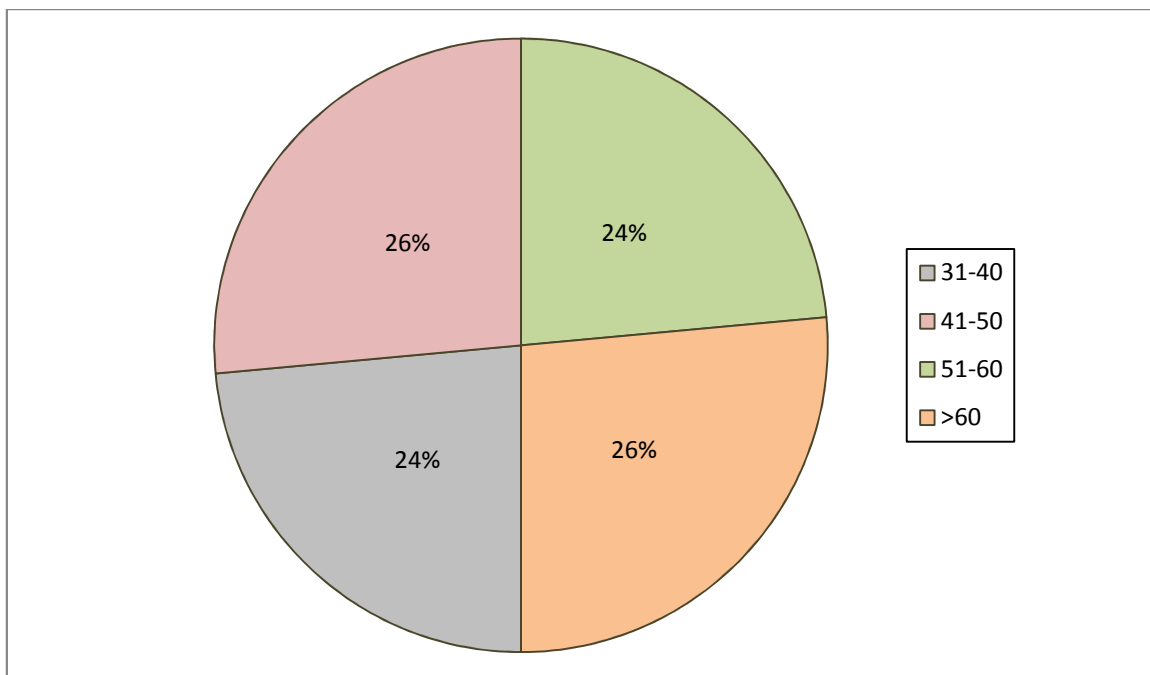
Twenty-four per cent more males participated in the interviews than females. This reflects a greater predominance of males than applies to the gender distribution of the 111 session presenters of the 2013 Phase 2 modules (which are pertinent to the study). Sixty-three (57 per cent) of these session presenters were males and forty-eight (43 per cent) were females (UFS School of Medicine Phase II Phase guide for 2013-2014 and electronic information provided by Ms C Swart and Dr D Goedhals on 15 January 2013: cf. Appendix K).

The above-mentioned statistics can be compared to gender profiles at the UFS Faculty of Health Sciences, which represent the broader context of the study. On 28 October 2013, 252 of the 282 permanently appointed Faculty Board members were directly involved in the UFS undergraduate medical curriculum in a management and/or teaching capacity. Of these 252 permanently appointed personnel, 120 (48 per cent) were female and 132 (52 per cent) were male. Session presenters of the 2013 Phase 2 modules who were full-time UFS employees were not directly responsible for patient management. They were mainly responsible for administration, tuition and research, although some of them were involved in community-related activities to a limited extent. With regard to the research topic, the researcher regarded it to be of practical significance that seventy-four per cent of the 69 full-time UFS personnel were female and 62 per cent of the 183 personnel jointly appointed by the Department of Health (DoH) and the UFS were male (electronic document provided by Mrs M Viljoen on 28 October 2013). On 28 October 2013 the full-time UFS personnel were predominantly female, in contrast to the gender distribution of the interviewees. The research topic and related participant inclusion criteria influenced the gender distribution of the purposive sample: 65 per cent of the interviewees (of which 68 per cent were males

and 32 per cent were females) were involved in clinical work and were therefore employed in a joint capacity by the DoH and the UFS at the time of the study.

#### 4.3.2 The age distribution of the sample

Figure 4.1 reflects the percentages of respondents in the different age intervals (in years).

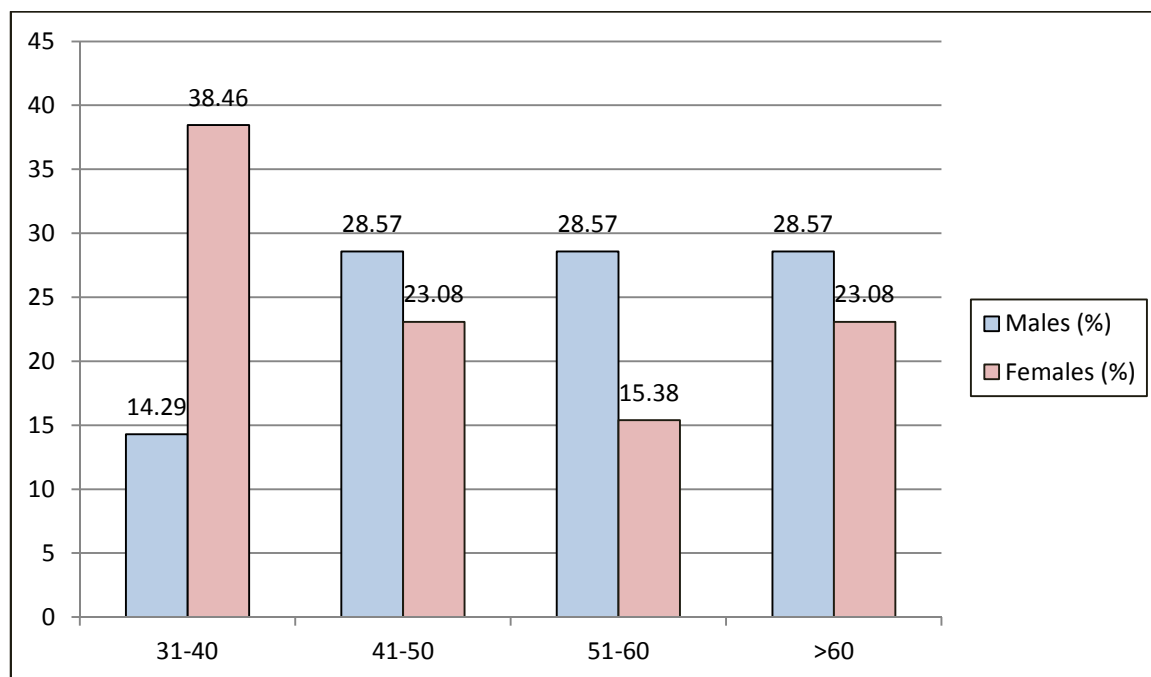


**FIGURE 4.1: THE DISTRIBUTION OF AGE INTERVALS OF RESPONDENTS (Question 1.2, Section 1 of the interview schedule) [n=34]**

All participants were older than 30 years of age. Approximately 25 per cent of interviewees belonged to each of the four designated age intervals above 30 years. Therefore, data was obtained from a significant number of respondents (with varying occupational roles) in each age interval. Participants older than 60 years had accumulated practical experience and exposure to patient-related and/or curriculum-related problems over an extended period of time. They could therefore be expected to be in a particularly favourable position to provide valuable qualitative input.

#### 4.3.2.1 *The gender-related age distribution in the sample*

Figure 4.2 indicates the gender-related distribution of the different age intervals.

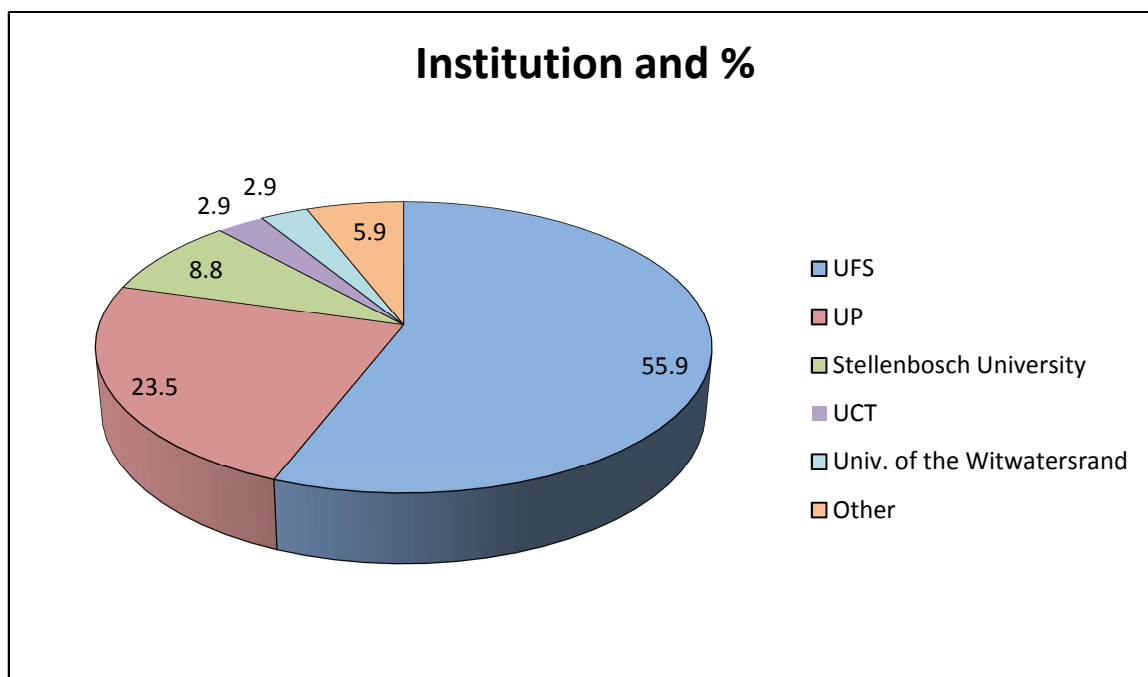


**FIGURE 4.2: THE GENDER-RELATED DISTRIBUTION OF AGE INTERVALS (derived from Questions 1.1 and 1.2, Section 1 of the interview schedule) [n=34]**

In contrast to the other age interval categories, there were more female than male respondents in the 31 to 40 years age interval. The researcher could not establish a significant contributing factor to this phenomenon, which does not appear to be directly related to the research topic (which focused on the preclinical phase), since (at the time of the study) only four females in the purposive sample were involved in preclinical work only. The male gender percentages (with respect to the total participant number) in the three other age intervals were the same. In the data analysis the correlation of these gender-specific percentages with the qualitative data would have been more significant in a larger purposive sample.

### 4.3.3 The institutions where participants completed their undergraduate tertiary training

Figure 4.3 reflects the educational institutions where the participants completed their undergraduate tertiary training.

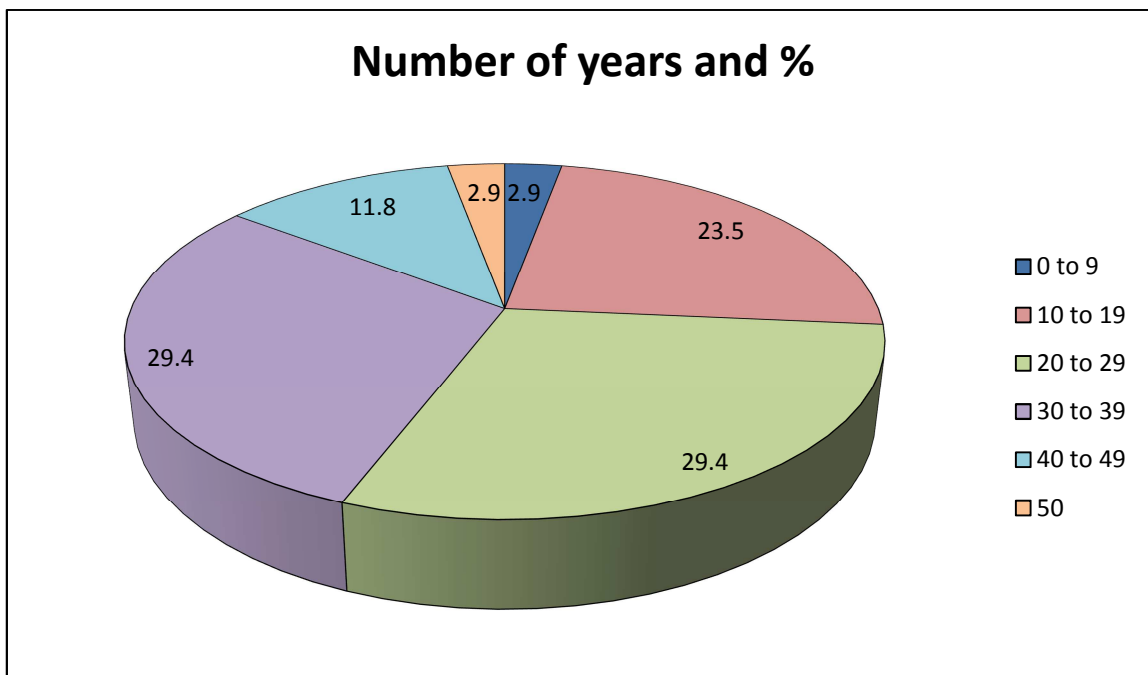


**FIGURE 4.3: THE INSTITUTIONS WHERE PARTICIPANTS COMPLETED THEIR UNDERGRADUATE TERTIARY TRAINING (Question 1.3, Section 1 of the interview schedule) [n=34]**

Most respondents (56 per cent) completed their undergraduate tertiary training at the UFS. It can therefore be deduced that more than half of the respondents have a good knowledge and insight into the local UFS context (academic and socio-culturally) that current students are experiencing. However, the profile of medical students has changed significantly since 1994, in order to reflect the diversity of races and cultures in the broader South African context. The organisation of the content of the undergraduate medical curriculum also changed significantly in 2000, when the previous six-year curriculum was adapted to accommodate a more integrated outcome-based five-year core curriculum. No respondents completed their undergraduate tertiary training at Medunsa, the University of Kwazulu Natal or the Walter Sisulu University. Two respondents graduated at Taka University in Bangladesh and Makerere University in Uganda, respectively.

#### 4.3.4 The number of years since completion of participants' undergraduate tertiary training

Figure 4.4 summarises the number of years (arranged in intervals, as derived from the stipulated year) since participants' completion of their undergraduate tertiary training.

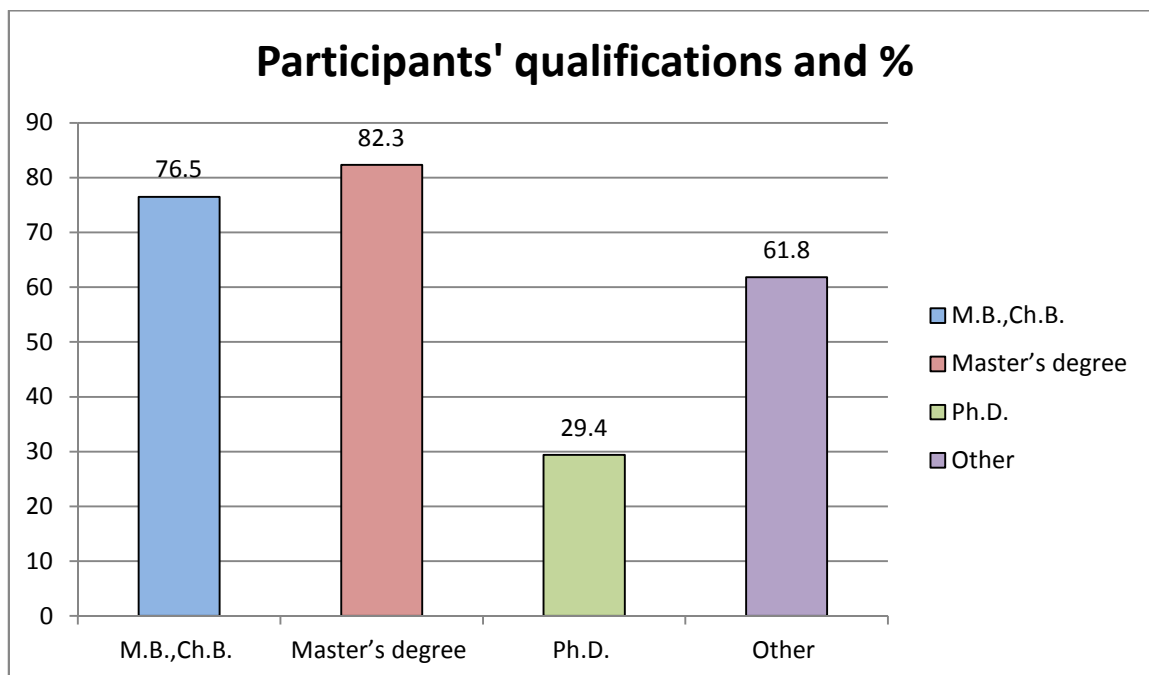


**FIGURE 4.4: THE NUMBER OF YEARS SINCE COMPLETION OF PARTICIPANTS' UNDERGRADUATE TERTIARY TRAINING (Question 1.4, Section 1 of the interview schedule) [n=34]**

At the time of the study, the majority (approximately 97 per cent) of interviewees had completed their undergraduate tertiary training ten or more years previously. One of these interviewees had done so 50 years previously. The majority of interviewees were therefore in an advantageous position to provide valuable qualitative input, due to the practical experience that they had gained during their working careers. This observation is similar to the remarks (found in the discussion for section 4.3.2) which emphasize the value of accumulated patient-related and/or curriculum-related practical experiences over an extended period of time.

### 4.3.5 The participants' professional qualifications

Figure 4.5 summarises the participants' professional qualifications.

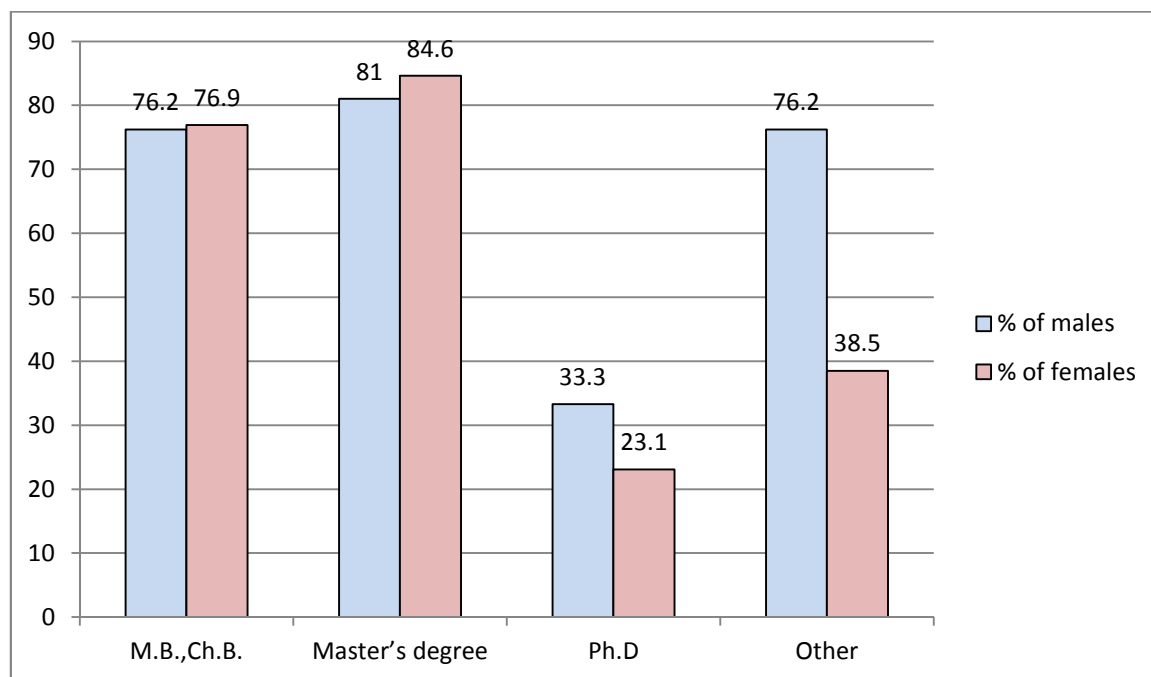


**FIGURE 4.5: THE PARTICIPANTS' PROFESSIONAL QUALIFICATIONS (Question 1.5, Section 1 of the interview schedule) [n=34]**

The percentages in Figure 4.6 support the assertions under 4.3.2 and 4.3.4 that the interviewees (based on their academic exposure) were in an advantageous position to provide noteworthy qualitative input. As expected (taking into account their occupational designations), 79 per cent of the participants had attained a Master's degree (of which 3 constituted a Master's degree in Health Professions Education) and 29 per cent of them had completed a Ph.D. (of which 3 constituted Ph.D.'s in Health Professions Education) at the time of the study. The qualifications (applicable to the research topic) that constituted the "other" category included B.M.Sc., B.M.Sc. (Hons), and M.Sc. degrees, B.Sc. (Physiology and Chemistry), various postgraduate medical discipline-based diplomas, and various Royal College medical degrees. The diversity of professional qualifications and related occupational exposure of the interviewees enhanced the potential quality of data that could be collected.

#### 4.3.5.1 *The qualifications of the two gender groups in the sample*

Figure 4.6 indicates the qualifications of the two gender groups in the sample.

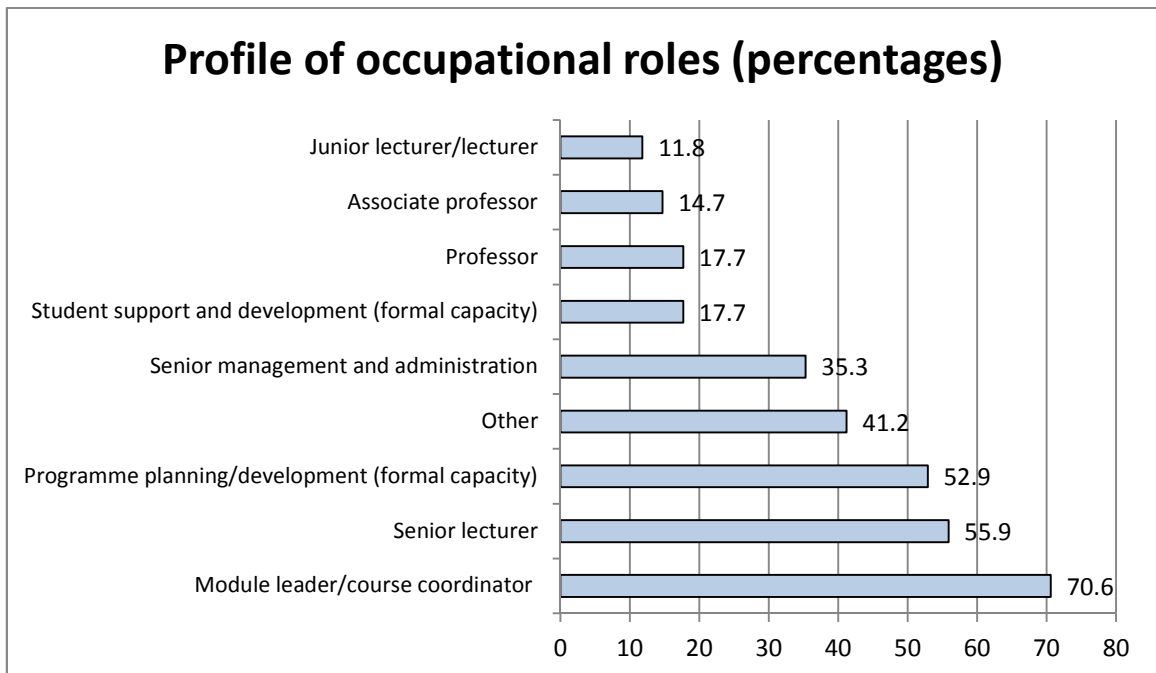


**FIGURE 4.6: THE QUALIFICATIONS OF THE TWO GENDER GROUPS IN THE SAMPLE (Questions 1.1 and 1.5, Section 1 of the interview schedule) [n=34]**

As previously indicated under 4.3.1, the majority (62 per cent) of the participants were male. The gender-related percentages of participants with a M.B.,Ch.B. degree were very similar (77 per cent of females as opposed to 76 per cent of males). A greater percentage of females (85 per cent of the females) than males (81 per cent of the males) had attained a Master's degree. However, a greater percentage of males (33 per cent of the males) than females (23 per cent of the females) had a Ph.D. A greater percentage (76 per cent) of males, than females (39 per cent) had qualifications in the "other" category. This may have placed the male participants in a better position to understand the research process and participate in the research study, although the purposive sample for the study was small and the duration and breadth of occupational experience were also advantageous in this regard.

#### 4.3.6 Participants' occupational designations, positions or roles at the time of the study

Figure 4.7 reflects the participants' occupational designations, positions or roles at the time of the study.



**FIGURE 4.7: THE PARTICIPANTS' OCCUPATIONAL DESIGNATIONS, POSITIONS OR ROLES (Question 1.6, Section 1 of the interview schedule) [n=34]**

At the time of the study, many participants were fulfilling multiple occupational roles. This made the interpretation of the statistical data difficult. Twenty-four (71 per cent) of the participants were module leaders or course coordinators and therefore had knowledge and experience of the UFS medical curriculum. However, 10 (42 per cent) of these module leaders were not course coordinators of semester four or five courses, which placed them in a less advantageous position to make specific recommendations regarding the semester four and five curriculum content and logistical arrangements, as applicable to community-based electrocardiography teaching. Thirty (88 per cent) of the participants were senior lecturers or professors who could be expected to provide constructive recommendations regarding curriculum content. Fifty-three (53) per cent of participants were involved in programme planning and development in a formal capacity, and could be expected to provide useful input regarding curriculum

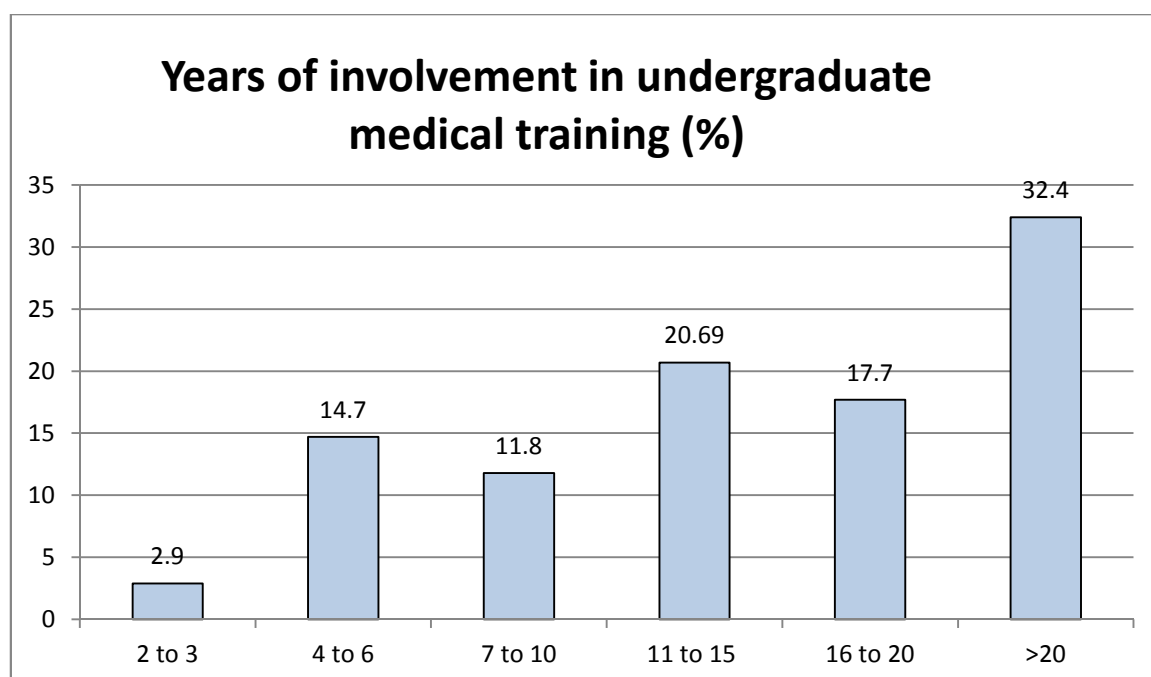


content and development and especially regarding logistical curriculum arrangements. The 18 percent of participants who were involved in student support and development in a formal capacity at the time of the study were especially knowledgeable regarding student-related concerns pertaining to curriculum content and logistical arrangements.

#### **4.4 PARTICIPANTS' NUMBER OF YEARS OF INVOLVEMENT IN UNDERGRADUATE MEDICAL TRAINING AND THEIR INVOLVEMENT IN SEMESTERS FOUR AND FIVE OF THE UNDERGRADUATE MEDICAL CURRICULUM**

##### **4.4.1 Participants' number of years of involvement in undergraduate medical training**

Figure 4.8 reflects the number of years of participant involvement in undergraduate medical training (in any capacity and not only at the UFS).



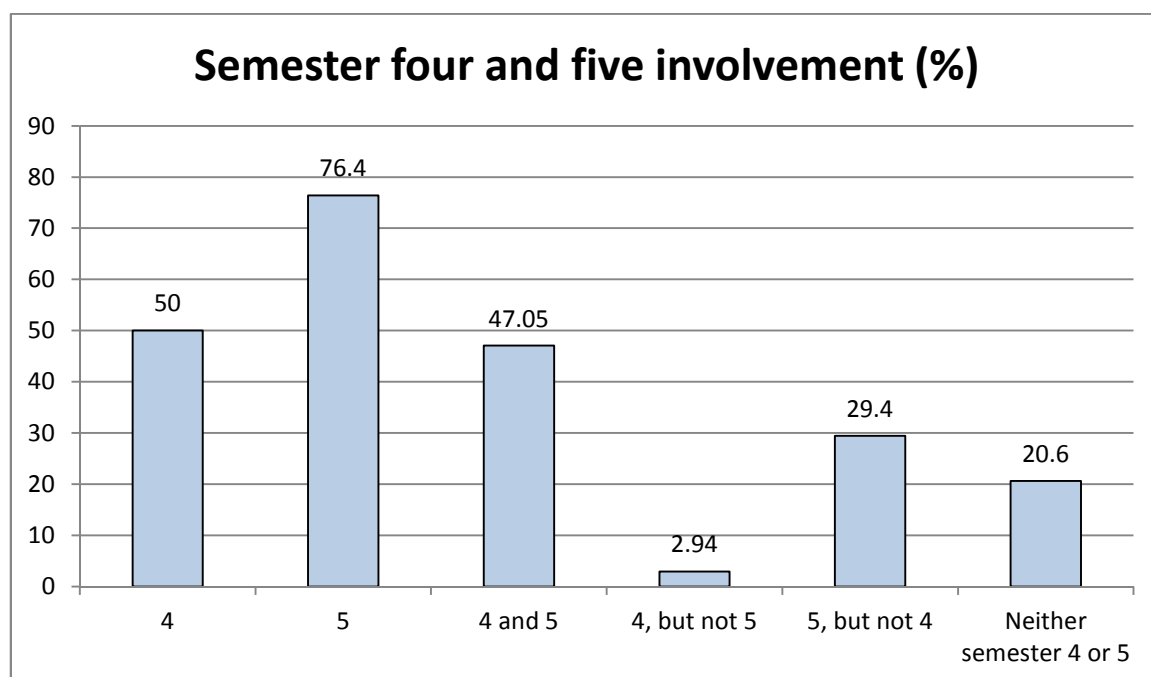
**FIGURE 4.8: PARTICIPANTS' NUMBER OF YEARS OF INVOLVEMENT IN UNDERGRADUATE MEDICAL TRAINING (Question 2.1, Section 2 of the interview schedule) [n=34]**

A total of 24 (71 per cent) of the participants had more than 10 years' involvement in undergraduate medical training, of which 11 participants (32 per cent) had more than

20 years' involvement. No participants had less than 2 years of experience in undergraduate medical training. This was very significant with regard to answering the second research question, i.e. "What are the attitudes and opinions of Faculty members who are in a favourable position to provide information with regard to the feasibility of the implementation of community-based electrocardiography during semesters four and five of the UFS undergraduate medical curriculum?"

#### 4.4.2 Participant involvement in semesters four and five teaching and learning of the UFS M.B.,Ch.B. curriculum

Figure 4.9 reflects participant involvement in semesters four and five teaching and learning of the UFS M.B., Ch.B. curriculum.



**FIGURE 4.9: PARTICIPANT INVOLVEMENT IN SEMESTERS FOUR AND FIVE TEACHING AND LEARNING IN THE UFS M.B.,Ch.B. CURRICULUM (Questions 2.2 and 2.3, Section 2 of the interview schedule) [n=34]**

At the time of the study less participants were involved in teaching and learning in semester four of the UFS M.B.,Ch.B. curriculum than in semester five. The percentage difference was 26.4 per cent. Information on the perspectives of personnel regarding semester four was important, since the basic electrocardiography theory, with the practical application thereof, is introduced during semester four. It can be deduced

that personnel not directly involved in semester four would have less knowledge and experience of the semester four learning content and logistics than personnel directly involved. Forty-seven (47) per cent of respondents were involved in semester four and five teaching and learning and therefore had a broad overview of phase 2 learning, including in-depth knowledge of the phase 2 curriculum content and time schedules. Seven participants (20.6 per cent) were not directly involved in semester four and five teaching and learning, but of these interviewees 4 had extensive knowledge and experience of community-based teaching and learning, 1 had in-depth knowledge and experience of electrocardiography teaching and learning and 2 had extensive knowledge of tertiary education.

#### **4.5 PARTICIPANTS' THEORETICAL KNOWLEDGE, EXPERIENCE AND PERSONAL OPINIONS REGARDING CBL IN THE UFS M.B.,CH.B. CURRICULUM**

##### **4.5.1 Participants' theoretical knowledge regarding CBL**

Table 4.2 reflects participants' level of theoretical knowledge regarding CBL.

**TABLE 4.2: PARTICIPANTS' THEORETICAL KNOWLEDGE REGARDING CBL (Question 3.1, Section 3 of the interview schedule) [n=34]**

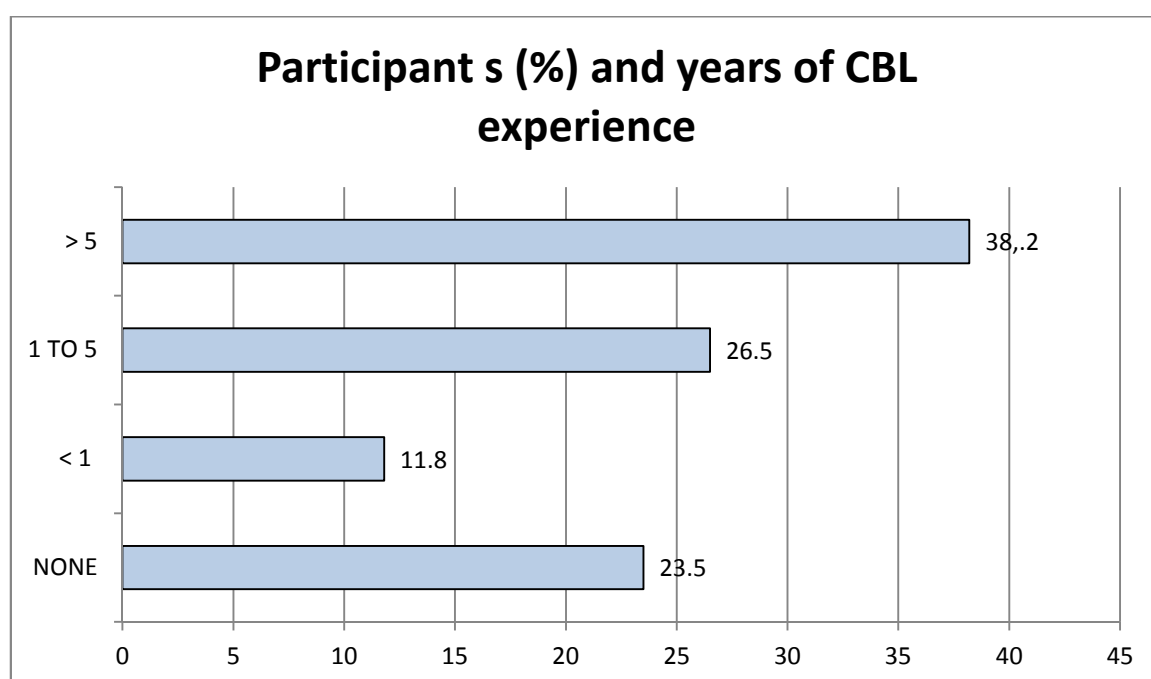
<b>LEVEL OF KNOWLEDGE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>NONE</b>	<b>2</b>	<b>5.9</b>
<b>BASIC DEFINITION AND LIMITED KNOWLEDGE OF 1 CONTEXT</b>	<b>8</b>	<b>23.5</b>
<b>BASIC DEFINITION AND LIMITED KNOWLEDGE OF &gt;1 CONTEXT</b>	<b>15</b>	<b>44.1</b>
<b>BASIC DEFINITION AND IN-DEPTH KNOWLEDGE OF <math>\geq 1</math> CONTEXT</b>	<b>9</b>	<b>26.5</b>

The majority of participants (94%) understood the basic definition of CBL and had at least limited knowledge of at least one context. Nine participants (26.5 per cent of the total purposive sample) had in-depth knowledge of one or more CBL contexts, and

could therefore provide detailed evaluative feedback regarding CBL, including the practical CBL-related challenges. Due to previously encountered problems, these participants could provide very useful information with respect to the feasibility of implementing CBL in the preclinical phase (cf. Chapter 5 Tables 5.1 and 5.2).

#### 4.5.2 Participants' number of years of experience regarding community-based learning

Figure 4.10 reflects participants' number of years of experience regarding CBL.



**FIGURE 4.10: PARTICIPANTS' NUMBER OF YEARS OF EXPERIENCE OF CBL (Question 3.2, Section 3 of the interview schedule) [n=34]**

Twenty-four (24) per cent of the participants had no personal practical experience of community-based learning, although Figure 4.10 indicates that 94 per cent of the participants had at least limited knowledge of one context. Sixty-five (65) per cent of respondents had at least one year of CBL-related experience and 38 per cent had more than five years' experience. This supports the observation in the discussion of Table 4.2 under 4.5.1 that more than 25 per cent of the participants could provide detailed evaluative input regarding CBL, including the practical CBL-related challenges. These participants were in a good position to identify the most common CBL-related challenges and to suggest practicable solutions to these problems.

### 4.5.3 Participants' experience with respect to the number of CBL contexts

Table 4.3 reflects participants' experience in terms of the number of CBL contexts.

**TABLE 4.3: PARTICIPANTS' EXPERIENCE IN TERMS OF THE NUMBER OF CBL CONTEXTS (Question 3.3, Section 3 of the interview schedule) [n=34]**

NUMBER OF CONTEXTS	FREQUENCY	PERCENTAGE
NONE	8	23.5
1 OR 2	10	29.4
≥ 3	16	47.1

Forty-seven (47) per cent of the respondents (n=16) had worked in three or more different CBL environments. This constitutes almost half of the total purposive sample. These persons could compare CBL in three or more different settings and comment on the common and context-specific challenges of each context. During the interviews the researcher deduced that participants' recommendations based on experience related to a number of contexts was very valuable, because examples of actual and potential practical problems could be provided.

### 4.5.4 An integrated analysis of participants' CBL-related theoretical knowledge and experience in terms of years and number of contexts

Table 4.4 provides an integrated analysis of participants' CBL-related theoretical knowledge and experience in terms of years and number of contexts.

**TABLE 4.4: AN INTEGRATED ANALYSIS OF PARTICIPANTS' RESPONSES TO QUESTIONS 3.1, 3.2 AND 3.3 (Section 3 of the interview schedule) [n=34]**

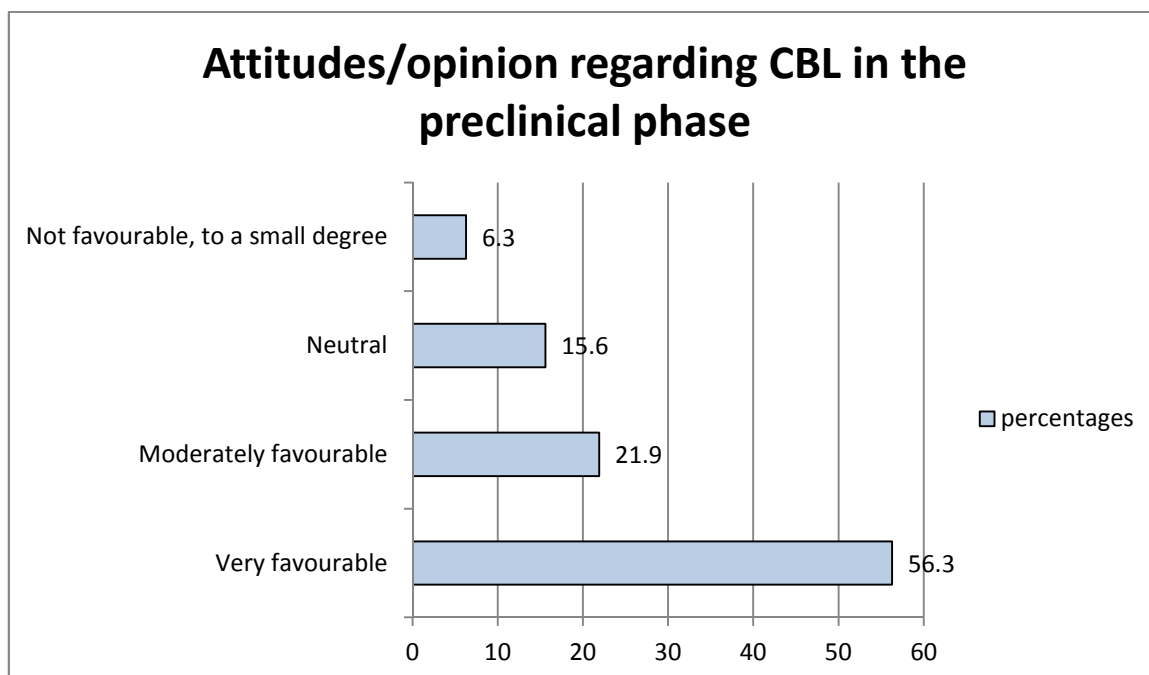
<b>THEORETICAL KNOWLEDGE</b>	<b>YEARS OF EXPERIENCE</b>	<b>BREADTH OF EXPERIENCE</b>	<b>FREQUENCY</b>	<b>%</b>
<b>NONE</b>	<b>NONE</b>	<b>NONE</b>	<b>2</b>	<b>5.9</b>
<b>DEFINITION AND LIMITED KNOWLEDGE OF 1 CONTEXT</b>	<b>NONE</b>	<b>NONE</b>	<b>5</b>	<b>14.7</b>
<b>DEFINITION AND LIMITED KNOWLEDGE OF 1 CONTEXT</b>	<b>&lt; 1</b>	<b>1 OR 2</b>	<b>3</b>	<b>8.8</b>
<b>DEFINITION AND LIMITED KNOWLEDGE OF &gt;1 CONTEXT</b>	<b>NONE</b>	<b>NONE</b>	<b>1</b>	<b>2.9</b>
<b>DEFINITION AND LIMITED KNOWLEDGE OF &gt;1 CONTEXT</b>	<b>&lt; 1</b>	<b>1 OR 2</b>	<b>1</b>	<b>2.9</b>
<b>DEFINITION AND LIMITED KNOWLEDGE OF &gt;1 CONTEXT</b>	<b>1 TO 5</b>	<b>1 OR 2</b>	<b>3</b>	<b>8.8</b>
<b>BASIC DEFINITION AND LIMITED KNOWLEDGE OF &gt;1 CONTEXT</b>	<b>1 TO 5</b>	<b>≥ 3</b>	<b>4</b>	<b>11.8</b>
<b>DEFINITION AND LIMITED KNOWLEDGE OF &gt;1 CONTEXT</b>	<b>&gt; 5</b>	<b>1 OR 2</b>	<b>2</b>	<b>5.9</b>

<b>THEORETICAL KNOWLEDGE</b>	<b>YEARS OF EXPERIENCE</b>	<b>BREADTH OF EXPERIENCE</b>	<b>FREQUENCY</b>	<b>%</b>
<b>DEFINITION AND LIMITED KNOWLEDGE OF &gt;1 CONTEXT</b>	<b>&gt; 5</b>	<b>≥ 3</b>	<b>4</b>	<b>11.8</b>
<b>DEFINITION AND IN-DEPTH KNOWLEDGE OF ≥ 1 CONTEXT</b>	<b>1 TO 5</b>	<b>1 OR 2</b>	<b>1</b>	<b>2.9</b>
<b>DEFINITION AND IN-DEPTH KNOWLEDGE OF ≥ 1 CONTEXT</b>	<b>1 TO 5</b>	<b>≥ 3</b>	<b>1</b>	<b>2.9</b>
<b>DEFINITION AND IN-DEPTH KNOWLEDGE OF ≥ 1 CONTEXT</b>	<b>&gt; 5</b>	<b>≥ 3</b>	<b>7</b>	<b>20.6</b>

Two respondents indicated that they had no theoretical knowledge or experience of CBL. However, these persons (respondent numbers 5 and 28), reported having knowledge and experience of undergraduate medical teaching and learning in the preclinical phase of the UFS medical curriculum. They could therefore provide informed input with regard to the available time and other logistical challenges pertaining to implementing CBL in the UFS curriculum. Of significance is that 7 (20,6 per cent) of the respondents had in-depth knowledge of one or more contexts, with more than 5 years' CBL experience and experience of a minimum of three different CBL contexts. They could therefore provide rich qualitative CBL-related data for the study.

#### 4.5.5 Participants' attitudes/opinions regarding CBL in the preclinical phase of the UFS M.B.,Ch.B. curriculum

Figure 4.11 provides a profile of participants' attitudes/opinions regarding CBL in the preclinical phase of the UFS M.B.,Ch.B. curriculum.



**FIGURE 4.11: PARTICIPANTS' ATTITUDES/OPINIONS REGARDING CBL IN THE PRECLINICAL PHASE OF THE UFS M.B.,Ch.B. CURRICULUM (Question 3.4, Section 3 of the interview schedule) [n=32]**

The table reflects that 56 per cent of the respondents stated that they were very favourable w.r.t. CBL in the preclinical phase of the UFS M.B.,Ch.B. curriculum. In accordance with the interview guidelines of the research protocol, the two persons who had no knowledge or experience of CBL were not required to respond to Questions 3.4 to 4.7 of the interview schedule. This was done in order to only reflect the views of persons who could provide informed opinions on CBL. No respondents indicated that, to a large degree, they did not have a favourable attitude or opinion regarding CBL learning in the preclinical phase.



#### 4.5.6 Participants' opinions regarding adequate time to implement four hours of CBL in semesters four and five of the UFS M.B.,Ch.B. curriculum

Table 4.5 reflects a comparison of participants' opinions regarding adequate time to implement four hours of CBL in semesters four and five of the UFS M.B.,Ch.B. curriculum, respectively.

**TABLE 4.5: PARTICIPANTS' OPINIONS REGARDING QUESTIONS 3.5 AND 3.6 (Section 3 of the interview schedule) [n=32]**

OPINION	SEMESTER 4		SEMESTER 5	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
<b>Agree to a large extent</b>	<b>14</b>	<b>43.8</b>	<b>15</b>	<b>46.9</b>
<b>Agree to a moderate extent</b>	<b>6</b>	<b>18.8</b>	<b>5</b>	<b>15.6</b>
<b>Neutral</b>	<b>9</b>	<b>28.1</b>	<b>9</b>	<b>28.1</b>
<b>Do not agree to a moderate extent</b>	<b>3</b>	<b>9.4</b>	<b>3</b>	<b>9.4</b>
<b>Do not agree to a large extent</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Twenty participants (62.5 per cent of the total) agreed that there is sufficient time to implement four hours of CBL in semester four of the UFS M.B.,Ch.B. curriculum, with the majority of this number (70 per cent) agreeing to a large extent. Twenty-eight (28) per cent of the participants were neutral, which can be ascribed to the fact that 15 participants indicated that they lacked sufficient knowledge of the semester four programme content and time allocations (cf. the discussion under Table 5.1 in Chapter 5). No participants reported disagreement. These results reflect that the participants, as a group, were in greater agreement than disagreement with this statement.

Fifteen participants (47 per cent) agreed, to a large extent, that there is sufficient time to implement four hours of CBL in semester five of the UFS M.B.,Ch.B. curriculum. No participants indicated that they, to a large extent, disagreed in this regard.

The responses pertaining to semesters four and five can be compared. The majority of participants, as an equal percentage (62.5 per cent), agreed with the statement and the same percentage of participants (28 per cent) was neutral. The response for semester five, compared to semester four, was slightly more favourable: one additional person (representing three per cent) agreed to a large extent with this statement. However, this is not statistically significant for a sample of 32 participants. For semesters four and five, the same percentage (nine per cent) of participants disagreed with the statement.

#### **4.6 PARTICIPANTS' RESPONSES REGARDING TB CB LEARNING IN GENERAL AND ITS APPLICATION IN THE UFS M.B.,CH.B. CURRICULUM**

##### **4.6.1 Participants' opinions regarding the statement "Task-based CBL is a valuable form of authentic experiential learning."**

Table 4.6 reflects participants' opinions regarding the statement "Task-based CBL is a valuable form of authentic experiential learning".

**TABLE 4.6: PARTICIPANTS' OPINIONS REGARDING QUESTION 4.1 (Section 4 of the interview schedule) [n=32]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree to a large extent</b>	<b>26</b>	<b>81.3</b>
<b>Agree to a moderate extent</b>	<b>6</b>	<b>18.8</b>

This statement pertains to task-based CBL, without specifying a particular task, although examples of cardiovascular tasks are mentioned in the introductory statement. The majority of participants (81 per cent) agreed to a large extent with this statement and the rest of the participants reported moderate agreement. No

participants were neutral or indicated that they did not agree with this statement. This reflects that all the participants recognized the importance and potential value of task-based CBL, despite the well-documented CBL-related challenges.

**4.6.2 Participants’ opinions regarding the statement “Task-based community-based learning addresses critical cross-field outcomes or competencies such as time management, oral and written communication, ability to work as part of a team and critical problem-solving.”**

Table 4.7 reflects participants’ opinions in this regard.

**TABLE 4.7: PARTICIPANTS’ OPINIONS REGARDING QUESTION 4.2 (Section 4 of the interview schedule) [n=32]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree to a large extent</b>	<b>27</b>	<b>84.4</b>
<b>Agree to a moderate extent</b>	<b>5</b>	<b>15.6</b>

This statement does not specify a particular task. Twenty-seven (84 per cent) of the participants stated that they agree to a large extent with this statement. No participants were neutral or disagreed with the statement. The results are similar to those of Table 4.6: one more participant (representing a 3 per cent difference) agreed to a large extent, as compared to the previous statement and no participants were neutral or did not agree with this statement. This supports the observation in the discussion on Table 4.7 that all the participants recognized the potential advantages of task-based, community-based learning.

#### 4.6.3 Participants' opinions regarding the statement "There are other advantages of task-based CBL that do not apply to task-based learning (TBL) in the skills laboratory."

Table 4.8 reflects participants' opinions in this regard.

**TABLE 4.8: PARTICIPANTS' OPINIONS REGARDING QUESTION 4.3 (Section 4 of the interview schedule) [n=32]**

OPINION	FREQUENCY	PERCENTAGE
Agree to a large extent	23	71.9
Agree to a moderate extent	6	18.8
Neutral	2	6.3
Do not agree to a moderate extent	1	3.1
Do not agree to a large extent	0	0

Twenty-nine participants (91 per cent) agreed with this statement, of which twenty-three (72 per cent) agreed to a large extent. This reflects that 91 per cent of participants are of the opinion that task-based CBL has distinct advantages above TBL in the skills laboratory and therefore recognize the unique role of task-based CBL in medical curricula. Only one participant disagreed with the statement and this was to a moderate extent.

#### 4.6.4 Participants' opinions regarding the statement "Task-based CBL is appropriate for the preclinical phase of the UFS undergraduate medical curriculum."

Table 4.9 reflects participants' opinions in this regard.

**TABLE 4.9: PARTICIPANTS' OPINIONS REGARDING QUESTION 4.4 (Section 4 of the interview schedule) [n=32]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree to a large extent</b>	<b>21</b>	<b>65.6</b>
<b>Agree to a moderate extent</b>	<b>9</b>	<b>28.1</b>
<b>Neutral</b>	<b>1</b>	<b>3.1</b>
<b>Do not agree to a moderate extent</b>	<b>1</b>	<b>3.1</b>
<b>Do not agree to a large extent</b>	<b>0</b>	<b>0</b>

Ninety-four per cent of respondents supported this statement and twenty-one (66 per cent) of the participants agreed to a large extent with this statement. This is a smaller percentage than for the previous three statements (with a response rate of 81, 84 and 72 per cent, respectively). This reflects that the participants were less convinced that task-based CBL is appropriate for the preclinical phase, despite their responses to the three positive statements (advantages) of task-based CBL stated in questions 4.1 to 4.3 of the interview schedule. This implies that, despite the advantages stated, the phase during which this form of learning occurs will influence decisions.

**4.6.5 Participants' opinions regarding the statement "The challenges/obstacles/limitations of task-based CBL (such as the cost implications, available time in the programme, available staff, transport arrangements and ethical issues) can be overcome in the UFS undergraduate medical curriculum."**

Table 4.10 reflects participants' opinions in this regard.

**TABLE 4.10: PARTICIPANTS' OPINIONS REGARDING QUESTION 4.5 (Section 4 of the interview schedule) [n=32]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree to a large extent</b>	<b>9</b>	<b>28.1</b>
<b>Agree to a moderate extent</b>	<b>15</b>	<b>46.9</b>
<b>Neutral</b>	<b>7</b>	<b>21.9</b>
<b>Do not agree to a moderate extent</b>	<b>1</b>	<b>3.1</b>
<b>Do not agree to a large extent</b>	<b>0</b>	<b>0</b>

Seventy-five per cent of the interviewees agreed with this statement. The majority of participants (47 per cent) agreed to a moderate extent with this statement, which reflects that a significant number of participants were conservative in their positive opinion in this regard. The reasons for this should be elucidated, since 7 (21 per cent) of the participants had in-depth knowledge of one or more contexts, with more than 5 years' CBL experience and experience of a minimum of three different CBL contexts (cf. Table 4.13), and therefore had in-depth knowledge and experience of these challenges.

**4.6.6 Participants' opinions regarding the statement "The advantages of implementing task-based CBL in the preclinical phase of the UFS medical curriculum outweigh the disadvantages (such as the extra time required, cost and transport arrangements)."**

Table 4.11 reflects participants' opinions in this regard.

**TABLE 4.11: PARTICIPANTS' OPINIONS REGARDING QUESTION 4.6 (Section 4 of the interview schedule) [n=32]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree to a large extent</b>	<b>12</b>	<b>37.5</b>
<b>Agree to a moderate extent</b>	<b>15</b>	<b>46.9</b>
<b>Neutral</b>	<b>3</b>	<b>9.4</b>
<b>Do not agree to a moderate extent</b>	<b>2</b>	<b>6.3</b>
<b>Do not agree to a large extent</b>	<b>0</b>	<b>0</b>

Eighty-four per cent of interviewees agreed with this statement. Although 12 (37.5 per cent) of the respondents agreed to a large extent with this statement, the majority of respondents (46.9 per cent) expressed moderate agreement. This once again reflects that many respondents were conservative in their support in this regard. The reasons for this should be identified and elucidated: in Chapter 5 key aspects mentioned by the respondents, applicable to task-based CBL in the preclinical phase, will be discussed.

#### 4.6.7 Participants' general personal attitudes/opinions regarding TB CBL in the preclinical phase of the UFS M.B.,Ch.B. curriculum

Table 4.12 reflects participants' general personal attitudes/opinions regarding task-based CBL in the preclinical phase of the UFS M.B., Ch.B. medical curriculum.

**TABLE 4.12: PARTICIPANTS' PERSONAL ATTITUDES/OPINIONS REGARDING TB CBL IN THE PRECLINICAL PHASE OF THE UFS M.B.,CH.B CURRICULUM (Question 4.7, Section 4 of the interview schedule) [n=32]**

OPINION	FREQUENCY	PERCENTAGE
Very favourable	21	65.6
Moderately favourable	8	25.0
Neutral	0	0
Not favourable to a small degree	3	9.4
Not favourable to a large degree	0	0

Despite concerns that were voiced during the interviews by many respondents, the majority (65.6 per cent) of respondents expressed a very favourable attitude/opinion regarding task-based CBL in the preclinical phase of the UFS undergraduate medical curriculum. This reflects that the Faculty personnel, in general, would support its implementation if the related obstacles or challenges could be overcome.



#### **4.7 PARTICIPANTS' THEORETICAL AND PRACTICAL KNOWLEDGE AND NUMBER OF YEARS OF EXPERIENCE REGARDING ECG LEARNING IN MEDICAL EDUCATION**

##### **4.7.1 Participants' theoretical and practical knowledge of electrocardiography**

Table 4.13 reflects participants' theoretical and practical knowledge of electrocardiography.

**TABLE 4.13: PARTICIPANTS' THEORETICAL AND PRACTICAL KNOWLEDGE OF ELECTROCARDIOGRAPHY (Question 5.1, Section 5 of the interview schedule) [n=34]**

<b>THEORETICAL AND PRACTICAL ECG KNOWLEDGE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>None</b>	<b>3</b>	<b>8.8</b>
<b>Below "the reasonable SA GP" level</b>	<b>8</b>	<b>23.5</b>
<b>On "the reasonable SA GP" level</b>	<b>12</b>	<b>35.3</b>
<b>On "the reasonable SA specialist level across all disciplines"</b>	<b>11</b>	<b>32.4</b>
<b>Other</b>	<b>0</b>	<b>0</b>

The greatest number (i.e. 12, constituting 35.3 per cent) of respondents had knowledge on the level of "the reasonable South African general practitioner" and 11 (32.4 per cent) of the respondents reported having knowledge on the level of "the reasonable South African specialist across all disciplines". This reflects that 68 per cent of the respondents were in a position to provide ECG-related undergraduate medical training and at least 68 per cent of respondents were therefore in an advantageous position to provide useful information in this regard.

#### 4.7.2 Participants' theoretical and practical knowledge of ECG learning in undergraduate medical curricula

Table 4.14 reflects participants' theoretical and practical knowledge of electrocardiography learning in undergraduate medical curricula.

**TABLE 4.14: PARTICIPANTS' THEORETICAL AND PRACTICAL KNOWLEDGE OF ECG LEARNING IN UNDERGRADUATE MEDICAL CURRICULA (Question 5.2, Section 5 of the interview schedule) [n=34]**

<b>THEORETICAL AND PRACTICAL KNOWLEDGE OF ECG LEARNING IN UNDERGRADUATE MEDICAL CURRICULA</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>None</b>	<b>4</b>	<b>11.8</b>
<b>Below "the reasonable SA GP" level</b>	<b>7</b>	<b>20.6</b>
<b>On "the reasonable SA GP" level</b>	<b>14</b>	<b>41.2</b>
<b>On "the reasonable SA specialist level across all disciplines"</b>	<b>8</b>	<b>23.5</b>
<b>Other</b>	<b>1</b>	<b>2.9</b>

Once again the greatest number (i.e. 14, which constitutes 41.2 per cent) of respondents had knowledge on the level of "the reasonable South African general practitioner" and 8 (23.5 per cent) of the respondents reported having knowledge on the level of "the reasonable South African specialist across all disciplines". This is comparable to the results provided in Table 4.13 and reflects that at least 65 per cent of the respondents were in a potentially good position to provide useful input with regard to undergraduate ECG learning.

#### 4.7.3 Participants' number of years of personal experience in providing ECG training

Table 4.15 reflects participants' number of years of personal experience in providing ECG training (undergraduate and/or postgraduate medical education).

**TABLE 4.15: PARTICIPANTS' NUMBER OF YEARS OF PERSONAL EXPERIENCE IN PROVIDING ELECTROCARDIOGRAPHY TRAINING IN UNDERGRADUATE AND/OR POSTGRADUATE MEDICAL EDUCATION (Question 5.3, Section 5 of the interview schedule) [n=34]**

NUMBER OF YEARS	FREQUENCY	PERCENTAGE
None	12	35.3
< 1	0	0
2 to 5	8	23.5
6 to 10	5	14.7
11 to 20	4	11.8
> 20	5	14.7

This table indicates that 65 per cent of respondents had personal experience in providing undergraduate and/or postgraduate electrocardiography training. This corresponds with Table 4.14 that reflects that 65 per cent of respondents indicated that they had theoretical and practical knowledge of ECG learning regarding undergraduate medical curricula.

Although 68 per cent of respondents (cf. Table 4.13) had knowledge of electrocardiography on the level of "the reasonable South African general practitioner" or higher, Table 4.15 reflects that 12 respondents (35.3 per cent) had no personal experience in providing electrocardiography training. This indicates that there are respondents that have no personal experience of providing ECG training despite the fact that they have ECG knowledge on the level of "the reasonable South African general practitioner" or higher (cf. Table 4.16). However, these interviewees could provide noteworthy ECG-related input due to their theoretical ECG knowledge.

#### 4.7.4 An integrated analysis of participants' knowledge of ECG and ECG learning and number of years' experience in providing undergraduate and/or postgraduate ECG training

Table 4.16 reflects an integrated analysis of participants' knowledge of ECG, and ECG learning and number of years' experience in providing undergraduate and/or postgraduate ECG training

**TABLE 4.16: AN INTEGRATED ANALYSIS OF RESPONSES TO QUESTIONS 5.1, 5.2 and 5.3 (Section 5 of the interview schedule) [n=34]**

LEVEL OF THEORETICAL AND PRACTICAL ECG KNOWLEDGE	KNOWLEDGE OF ECG LEARNING	NO. OF YEARS' EXPERIENCE OF PROVIDING ECG TRAINING	FREQUENCY	%
NONE	NONE	NONE	3	8.82
< "the reasonable SA GP"	NONE	NONE	1	2.94
< "the reasonable SA GP"	< "the reasonable SA GP"	NONE	4	11.76
< "the reasonable SA GP"	< "the reasonable SA GP"	2 to 5	1	2.94
< "the reasonable SA GP"	"the reasonable SA GP"	NONE	1	2.94
< "the reasonable SA GP"	"the reasonable SA GP"	11 to 20	1	2.94
"the reasonable SA GP"	< "the reasonable SA GP"	NONE	1	2.94

<b>LEVEL OF THEORETICAL AND PRACTICAL ECG KNOWLEDGE</b>	<b>KNOWLEDGE OF ECG LEARNING</b>	<b>NO. OF YEARS' EXPERIENCE OF PROVIDING ECG TRAINING</b>	<b>FREQUENCY</b>	<b>%</b>
"the reasonable SA GP"	"the reasonable SA GP"	NONE	2	5.88
"the reasonable SA GP"	"the reasonable SA GP"	2 to 5	5	14.71
"the reasonable SA GP"	"the reasonable SA GP"	6 to 10	3	8.82
"the reasonable SA GP"	"the reasonable SA GP"	11 to 20	1	2.94
"the reasonable SA specialist"	< "the reasonable SA GP"	2 to 5	1	2.94
"the reasonable SA specialist"	"the reasonable SA GP"	6 to 10	1	2.94
"the reasonable SA specialist"	"the reasonable SA specialist"	2 to 5	1	2.94
"the reasonable SA specialist"	"the reasonable SA specialist"	6 to 10	1	2.94
"the reasonable SA specialist"	"the reasonable SA specialist"	11 to 20	2	5.88
"the reasonable SA specialist"	"the reasonable SA specialist"	> 20	4	11.76
"the reasonable SA specialist"	Other	> 20	1	2.94

Three persons had no theoretical and practical knowledge of ECG and ECG learning, and no experience in providing ECG training. These persons were not required to answer the section 6 questions of the interview schedule. Consequently there were a total of 31 respondents for the questions pertaining to the contextual aspects of ECG learning.

Four respondents had more than 20 years' experience of providing ECG training and had proficiency in electrocardiography and ECG learning on a specialist level. They

were therefore well qualified to provide valuable input regarding the section 6 questions of the interview schedule.

One respondent (cf. Table 4.27: first shaded area) indicated that he had less theoretical and practical knowledge of electrocardiography than the reasonable SA general practitioner, despite 2 to 5 years' experience of providing ECG training. This person (respondent number 23) had an M.B.,Ch.B. degree with postgraduate qualifications, but had mainly been involved in the administration of the undergraduate medical curriculum and the teaching of a basic medical science. Another respondent (cf. Table 4.27: second shaded area) had more knowledge (namely on the level of the reasonable South African general practitioner) regarding undergraduate ECG learning than she had with regard to the theoretical and practical aspects thereof. This interviewee (number 19) had 11 to 20 years' experience of teaching the technical aspects of electrocardiography in the preclinical phase of the UFS medical curriculum. Conversely respondent number 34, despite reporting 2 to 5 years' experience of providing ECG training, had more knowledge of the theoretical and practical aspects of electrocardiography than of ECG learning. This illustrates the diversity of the interviewees with regard to their knowledge and experience of electrocardiography and electrocardiography learning, which was advantageous with respect to the potential richness of qualitative data that could be collected.

#### **4.8 PARTICIPANTS' RESPONSES REGARDING THE CONTEXTUAL ASPECTS OF ECG LEARNING**

##### **4.8.1 Participants' responses regarding the statement "The basic elements of normal electrocardiography, with a limited number of abnormal electrocardiographic patterns, should be taught in the preclinical phase of the UFS undergraduate medical curriculum."**

Table 4.17 reflects participants' responses in this regard.

**TABLE 4.17: PARTICIPANTS' RESPONSES TO QUESTION 6.1 (Section 6 of the interview schedule) [n=31]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree to a large extent</b>	<b>24</b>	<b>77.4</b>
<b>Agree to a moderate extent</b>	<b>6</b>	<b>19.4</b>
<b>Neutral</b>	<b>1</b>	<b>3.2</b>

This statement is applicable to the ECG training in the preclinical phase of the UFS curriculum. Although the specific abnormal ECG patterns are not identified here, 77.4 per cent of respondents strongly agreed with this statement. No respondents disagreed with this statement, which reflects that major adjustments regarding ECG curriculum content in the preclinical phase are not indicated and more attention can be directed towards the mode of ECG teaching than the curriculum content, in order to facilitate a smooth transition between the preclinical and clinical phases of ECG training.

**4.8.2 Participants' responses regarding the statement "Electrocardiography, in the preclinical phase, should preferably (if possible) be taught by lecturers who have clinical experience of electrocardiography."**

Table 4.18 reflects participants' responses in this regard.

**TABLE 4.18: PARTICIPANTS' RESPONSES TO QUESTION 6.2 (Section 6 of the interview schedule) [n=31]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree, to a large extent</b>	<b>19</b>	<b>61.3</b>
<b>Agree, to a moderate extent</b>	<b>9</b>	<b>29.3</b>
<b>Neutral</b>	<b>3</b>	<b>9.7</b>

Ninety-one (91) per cent of the respondents agreed with this statement, of which 67 per cent strongly agreed. These findings can be directly correlated with the qualitative data (cf. the discussion under Table 5.3 in Chapter 5), which indicated that most interviewees recognized the advantages of using a clinician as lecturer. These advantages included the practical contextual application of the theory and appropriate elaboration on learning content. No interviewees disagreed with this statement.

#### **4.8.3 Participants' responses regarding the statement "For undergraduate medical education, electrocardiography is appropriate for use as a learning task in the community setting."**

Table 4.19 reflects participants' responses in this regard.

**TABLE 4.19: PARTICIPANTS' RESPONSES TO QUESTION 6.3 (Section 6 of the interview schedule) [n=31]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree, to a large extent</b>	<b>18</b>	<b>58.1</b>
<b>Agree, to a moderate extent</b>	<b>7</b>	<b>22.6</b>
<b>Neutral</b>	<b>5</b>	<b>16.1</b>
<b>Do not agree to a moderate extent</b>	<b>1</b>	<b>3.2</b>
<b>Do not agree to a large extent</b>	<b>0</b>	<b>0</b>

No interviewees strongly disagreed with this statement. This finding can be related to the fact that this statement applies to the preclinical and clinical phases of the undergraduate medical curriculum.

Eighty-one (81) per cent of the participants agreed with the statement. However, the qualitative data (cf. Chapter 5, Table 5.3) reflected that many respondents stated that the local practical challenges of community-based electrocardiography learning had to



be clarified and addressed before they could report strong agreement with this statement.

**4.8.4 Participants' responses regarding the statement "Most of the electrocardiography-related learning outcomes for the preclinical phase can be addressed in the clinical skills unit in combination with simulation training, which renders TB CB electrocardiography training unnecessary."**

Table 4.20 reflects participants' responses in this regard.

**TABLE 4.20 PARTICIPANTS' RESPONSES TO QUESTION 6.4 (Section 6 of the interview schedule) [n=31]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree, to a large extent</b>	<b>9</b>	<b>29.0</b>
<b>Agree, to a moderate extent</b>	<b>10</b>	<b>32.3</b>
<b>Neutral</b>	<b>4</b>	<b>12.9</b>
<b>Do not agree to a moderate extent</b>	<b>2</b>	<b>6.5</b>
<b>Do not agree to a large extent</b>	<b>6</b>	<b>19.4</b>

Sixty-one (61) per cent of interviewees agreed with this statement. Although the researcher formulated this statement with the intention of eliciting detailed responses from the participants, two respondents (numbers 23 and 31) commented that the statement was problematic, since it contained two linked statements. They could agree with the first part of the statement, but not with the second part thereof. The researcher deduced that this was an important contributing factor to the phenomenon that a significant percentage (26 per cent) of participants disagreed with this statement.

**4.8.5 A comparison of participants' responses regarding the statements "The advantages of community-based electrocardiography learning in semesters four and/or five do not justify the extra costs that will be incurred due to, for example, transport and tuition materials." and "The advantages of community-based electrocardiography learning in semesters four and/or five do not justify the extra time and/or staff that will be required for electrocardiography learning."**

Table 4.21 provides a comparison between participants' responses in this regard.

**TABLE 4.21: PARTICIPANTS' RESPONSES TO QUESTIONS 6.5 and 6.6 (Section 6 of the interview schedule) [n=31]**

OPINION	QUESTION 6.5		QUESTION 6.6	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
<b>Agree, to a large extent</b>	<b>2</b>	<b>6.5</b>	<b>3</b>	<b>9.7</b>
<b>Agree, to a moderate extent</b>	<b>8</b>	<b>25.8</b>	<b>6</b>	<b>19.4</b>
<b>Neutral</b>	<b>4</b>	<b>12.9</b>	<b>6</b>	<b>19.4</b>
<b>Do not agree to a moderate extent</b>	<b>10</b>	<b>32.3</b>	<b>7</b>	<b>22.6</b>
<b>Do not agree to a large extent</b>	<b>7</b>	<b>22.6</b>	<b>9</b>	<b>29.0</b>

In general, the interviewees were less decisive with regard to their views on these resource-related statements, as compared to the previous statements. A small majority (56 per cent) of the respondents disagreed with the first (Question 6.5) statement. Three participants (respondents 1, 3 and 27) were of the opinion that there are additional, non ECG-specific advantages of introducing CBL during semesters four and five and consequently the financial costs should (if possible) not be a primary

determinant with regard to the feasibility of introducing community-based ECG learning in Phase 2.

Thirty-two (32) per cent of the respondents agreed with the first statement, but only 6.5 per cent of the total number of respondents strongly agreed, which reflects that the respondents, in general, were optimistic about the balance between the potential advantages and the required non-human resources.

Twenty-nine (29) per cent of the respondents agreed with the second (Question 6.6) statement, but only 9.7 per cent of the total number of respondents strongly agreed.

Therefore a smaller number of respondents agreed with the second statement than with the first statement, which reflects that the interviewees (as a group) were slightly less concerned about the human resource-related challenges than the non-human resource-related challenges.

Six and a half (6.5) per cent more participants were neutral with regard to their responses for the second statement than for the first statement, which reflects a greater degree of indecision regarding their views on the balance between the potential advantages and the human resource related (HR) challenges than is applicable to the non-HR-related challenges.

**4.8.6 Participants' responses regarding the statement "Another task, related to the cardiovascular system, e.g. the taking of blood pressure, will be more suitable to introduce as activity for task-based community-based learning in semesters four and/or five."**

Table 4.22 reflects participants' responses in this regard.

**TABLE 4.22: PARTICIPANTS' RESPONSES TO QUESTION 6.7 (Section 6 of the interview schedule) [n=31]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree, to a large extent</b>	<b>10</b>	<b>32.3</b>
<b>Agree, to a moderate extent</b>	<b>5</b>	<b>16.1</b>
<b>Neutral</b>	<b>4</b>	<b>12.9</b>
<b>Do not agree to a moderate extent</b>	<b>9</b>	<b>29.0</b>
<b>Do not agree to a large extent</b>	<b>3</b>	<b>9.7</b>

More participants (48 per cent) agreed with this statement than disagreed (39 per cent). Although 81 per cent of the participants agreed that "For undergraduate medical education, electrocardiography is appropriate for use as a learning task in the community setting" (cf. 4.8.3), 48 per cent of the participants were of the opinion that another cardiovascular system related learning task would be more suitable to use in the community in Phase 2. Thirteen (13) per cent of respondents provided a neutral answer, which reflects that they thought that electrocardiography was either equally appropriate or that it could be combined with another cardiovascular task (cf. Chapter 5, Table 5.3 for a list of tasks identified to be equally appropriate or more appropriate). Fifty-two (52) per cent of respondents were either neutral or did not agree with this statement, which reflects that electrocardiography as community-based learning task could be appropriate, provided the learning outcomes are formulated appropriately and/or electrocardiography is combined with another appropriate (preferably cardiovascular system-related) task. Seven respondents recommended combining an electrocardiography task with other community-based learning tasks (cf. the discussion under Table 5.3 in Chapter 5).

**4.8.7 Participants' responses regarding the statements "Community-based electrocardiography learning can be implemented in the preclinical phase of the UFS undergraduate medical curriculum." and "Community-based electrocardiography learning can be implemented in the clinical phase of the UFS undergraduate medical curriculum."**

Table 4.23 reflects participants' responses in this regard.

**TABLE 4.23: PARTICIPANTS' RESPONSES TO QUESTIONS 6.8 AND 6.10 (Section 6 of the interview schedule) [n=31]**

<b>OPINION</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
<b>Agree to a large extent</b>	<b>10</b>	<b>32.3</b>	<b>18</b>	<b>58.1</b>
<b>Agree to a moderate extent</b>	<b>7</b>	<b>22.6</b>	<b>7</b>	<b>22.6</b>
<b>Neutral</b>	<b>10</b>	<b>32.3</b>	<b>4</b>	<b>12.9</b>
<b>Do not agree to a moderate extent</b>	<b>3</b>	<b>9.7</b>	<b>1</b>	<b>3.2</b>
<b>Do not agree to a large extent</b>	<b>1</b>	<b>3.2</b>	<b>1</b>	<b>3.2</b>

The first statement referred to the preclinical phase of the UFS undergraduate medical curriculum. Fifty-five (55) per cent of the participants agreed with the first statement (Question 6.8), of which the majority (59 per cent) strongly agreed. Thirteen (13) per cent of the participants disagreed with the statement, of which only 25 per cent strongly disagreed.

The second statement referred to the clinical phase of the UFS undergraduate medical curriculum. Eighty-one (81) per cent of the participants agreed with the second statement (Question 6.10), of which the majority (72 per cent) strongly agreed. Six per

cent of the participants disagreed with the statement, of which 50 per cent disagreed to a large extent.

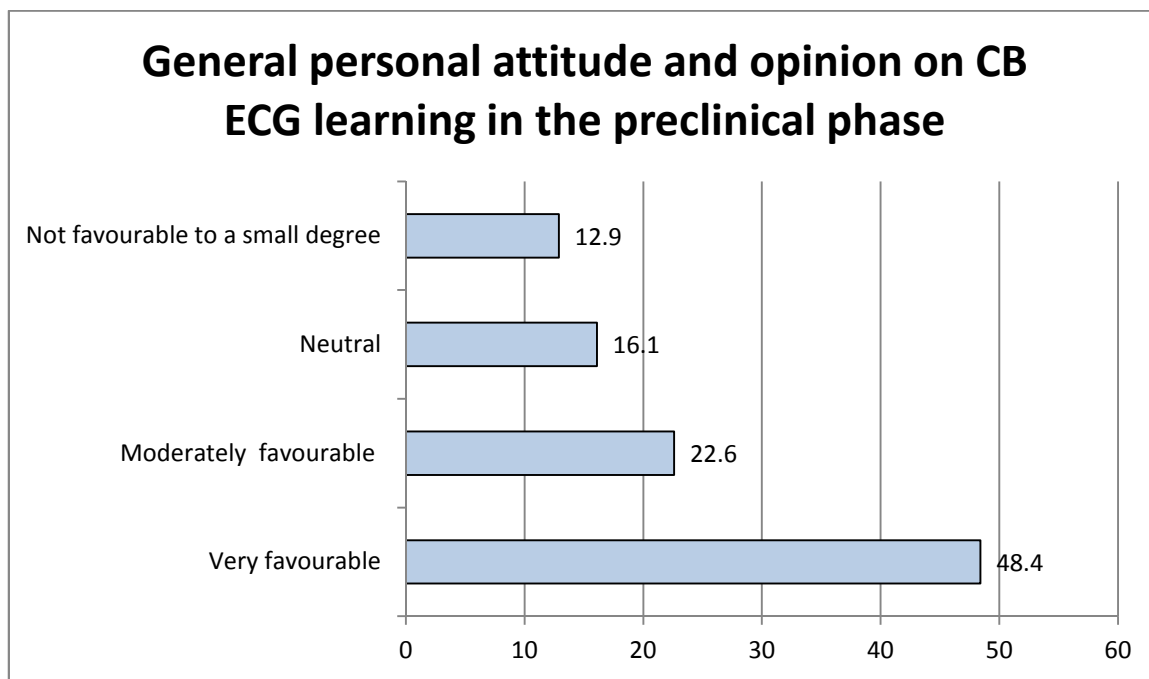
More respondents (with a 26 per cent percentage difference) were in favour of the implementation of community-based (CB) electrocardiography during the clinical phase of the curriculum than was the case for the preclinical phase of the curriculum. Seventy-two (72) per cent of the respondents who supported the implementation thereof, in the clinical phase indicated their strong support.

The results indicated in Table 4.23 are in alignment with the results reflected in Table 4.19, which illustrates that 81 per cent of participants were of the opinion that, for undergraduate medical education, electrocardiography is appropriate for use as a learning task in the community setting.

A comparison of the responses for the first and second statements also reflects that one participant strongly disagreed in each case (respondent numbers 32 and 28 respectively). Both of these respondents were specialists (in differing disciplines) and the researcher inferred from the qualitative data that both of these respondents were deeply concerned about the impact that the introduction of CB electrocardiography would have on the workloads of understaffed departments.

#### 4.8.8 Participants' general personal attitude and opinion regarding CB ECG learning in the preclinical phase of the UFS M.B.,Ch.B. curriculum

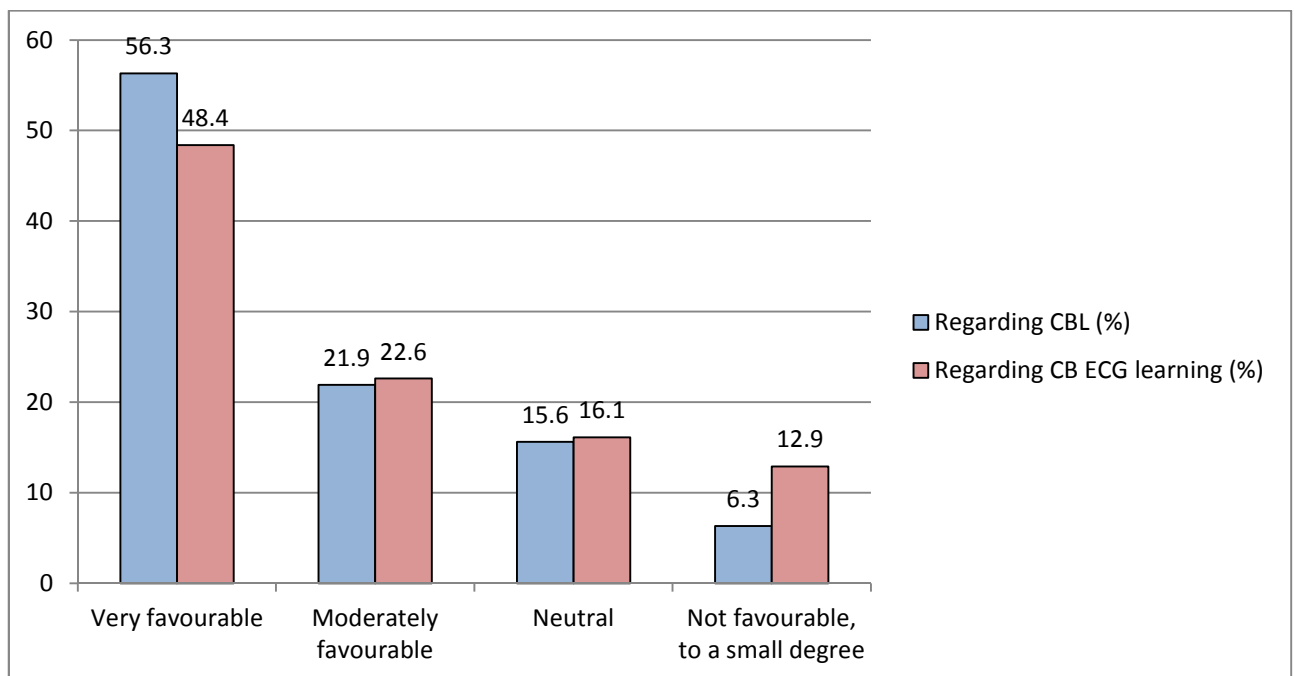
Figure 4.12 reflects participants' responses in this regard.



**FIGURE 4.12: PARTICIPANTS' GENERAL PERSONAL ATTITUDE AND OPINION REGARDING CB ECG LEARNING IN THE PRECLINICAL PHASE OF THE UFS M.B.,CH.B. CURRICULUM (Question 6.9, Section 6 of the interview schedule) [n=31]**

Seventy-one (71) per cent of the respondents indicated a favourable response in this regard, of which 68 per cent indicated a very favourable response. No respondents indicated that their dispositions in this regard were unfavourable to a large degree. These were very significant findings since the general disposition of personnel regarding the possible implementation of CB electrocardiography learning in the preclinical phase will influence the short-term and long-term feasibility thereof, especially in the context of understaffed departments (cf. Chapter 5, Table 5.3).

Figure 4.13 illustrates a comparison of these results with participants' general attitude and opinion regarding CBL in the preclinical phase (cf. Figure 4.11). As a group, the interviewees were more favourably disposed towards community-based learning in general than community-based ECG learning (78 per cent in favour of CBL, compared to 71 per cent in favour of CB ECG learning). These results can also be compared to the results reflected in Table 4.9 which indicate that 94 per cent of respondents agreed that task-based CBL is appropriate for the preclinical phase of the UFS undergraduate curriculum. These observations clarify and support the qualitative findings discussed in Chapter 5 under Table 5.3, where important prerequisites for success and negative factors related to using ECG as a community-based learning task are summarised.



**FIGURE 4.13: PARTICIPANTS' ATTITUDES AND OPINIONS REGARDING CBL AND CB ECG IN THE PRECLINICAL PHASE OF THE UFS M.B.,CH.B. CURRICULUM**



#### **4.9 A SUMMARY OF THE RESEARCH FINDINGS AND CONCLUSIONS**

In this chapter, the quantitative results of the structured interviews (with some reference to the qualitative results in Chapter 5) were presented and discussed.

Despite the small size of the purposive sample, useful quantitative data was collected, due to the diversity of interviewees' theoretical knowledge, occupational roles and previous employment experience. Interviewees not directly involved in semester four and five learning could provide valuable input due to their knowledge and/or experience of health professions education, electrocardiography or community-based learning. In general, the interviewees (as a group) were favourably disposed towards community-based learning and community-based electrocardiography learning in the preclinical phase. Although the majority of interviewees recognized the advantages of community-based learning, their responses with regard to the associated HR and non-HR related practical challenges and the possibility of addressing these challenges (in the context of the current locally available resources) were more variable. The majority of interviewees indicated that another cardiovascular system-related task (in preference to electrocardiography) would be more suitable to introduce as community-based learning task in the preclinical phase, although electrocardiography could be combined with another task to increase the feasibility of its implementation in the preclinical phase. More respondents supported the implementation of CB electrocardiography learning during the clinical phase of the curriculum than was the case for the preclinical phase of the curriculum.

Chapter 5, ***Results, analysis and discussion of the qualitative findings of the survey***, provides an exposition and discussion of the qualitative findings of the structured interviews. These findings include the perspectives of the interviewees with regard to community-based learning, task-based learning and electrocardiography learning in the UFS context.

## **CHAPTER 5**

### **RESULTS, ANALYSIS AND DISCUSSION OF THE QUALITATIVE FINDINGS OF THE SURVEY**

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#### **5.1 INTRODUCTION**

The purpose of this chapter is to present the qualitative results of the thirty-four (34) structured interviews conducted with a subgroup of members of the Faculty of Health Sciences at the University of the Free State.

The interview schedule, which included qualitative, open-ended components (cf. Appendix C), was designed to obtain the perspectives of available Faculty members who fulfilled the inclusion criteria (cf. Chapter 3).

Qualitative analysis of the following broad categories of data was performed:

1. Faculty members' knowledge, personal experience, attitudes, beliefs and opinions regarding:
  - a. Community-based learning
  - b. Task-based community-based learning
  - c. Electrocardiography learning
  - d. Community-based electrocardiography learning in the preclinical phase of the undergraduate UFS medical curriculum
  
2. Faculty members' views and recommendations regarding community-based electrocardiography learning in the UFS undergraduate M.B.,Ch.B. curriculum.

The principal aim of the qualitative data analysis was to identify and define the main research themes and sub-themes, arrange the available data into these themes and sub-themes, identify important correlations in the sub-themes (categories) and their sub-categories, and illustrate the relationship of each category and sub-category with the quantitative data obtained for each interview question.

As described in Chapter 3, (cf. 3.5) the researcher (in chronological order):

1. Obtained a general overview of the qualitative data documented in each of the 34 interview transcripts.
2. Electronically compiled (for questions 3.1 to 7, that generated qualitative data), the transcript data of all respondents for each question into one document.
3. Listed the principal themes (derived from the interview questions).
4. Identified prominent sub-themes (categories) and sub-categories of participant responses which emerged for a particular question.
5. Formulated descriptive sub-theme (category) and sub-category titles.
6. Formulated an appropriate abbreviation/code for each sub-theme (category).
7. Arranged the abbreviations/codes in an appropriate order.
8. Grouped the data into appropriate categories and sub-categories.
9. Selected and translated from Afrikaans into English (if necessary) appropriate transcript quotations, to illustrate and substantiate the selection of the identified categories and sub-categories.
10. Performed a preliminary data analysis.
11. Recoded and rearranged the documented data, as necessary.

In the discussion of the qualitative findings, the qualitative data will be correlated with the quantitative data, where appropriate. A short overview of the qualitative findings concludes the chapter.

## **5.2 COMMUNITY-BASED LEARNING**

Table 5.1 reflects the qualitative data regarding community-based learning (CBL).

**TABLE 5.1: COMMUNITY-BASED LEARNING (CBL)****(Section 3 of the interview schedule)**

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)
Theoretical knowledge	Definition of CBL (location and trainee)	CBL DEF	12: "community-based learning can also occur in the home, on the sports field... it does not have to be associated with health facilities" 14: "the definition of what people say is CBL is differs..... is Kimberley part of it?" "...the definition... it is a big caveat..." 18: "I also applied CBL with nursing personnel" 20: "taught patients, as well as nurses and the medical personnel..." 21: "outreaches... especially screening tests"
Number of years' experience	Contextual learning	CONT LNG	14: "with which problems patients present on the primary community area level" 17: "gives the students a very good insight into what lies ahead" 26: "...see patients in the environment... some of the patients I visited in their home" "to see what type of patients are attending the clinic: their social circumstances.... environmental and what they sort of think about the clinic... their background: .... their socio-economic..." 27: "can see from the beginning what lies ahead" 31: "orientate them... holistic approach... milieu of the patients" 33: "also being involved with the health care workers... have to do the home visits to see the environment and social determinants of health, in that specific environment"
Breadth of experience	Community health centres (where respondents worked)	COMM HC	4: "Omega centre for the elderly" 29: "Gabriel Dichabe clinic, and ...Sunflower House... Gateway clinic at National" 30: "Heidedal and in Batho and in the old age homes ....had an outreach thing to Lesotho: Leribe Hospital" 31: "Heidedal clinic...Sunflower House... I drove out to a clinic ... a care home in Mangaung for the Free State Society for the care of disabled... persons" 33: "old age homes.... social organisations, such as the churches ... and government institutions"

General personal attitude/opinion of respondents	Prerequisites for implementation	PRE	Appropriate learning outcomes (Sub-category A)	<p>4: "must define the outcomes very well... specific assigned task with prior instructions... aligned with his academic foundational knowledge"</p> <p>11. "integration with the specific curriculum and the extent of the curriculum"</p> <p>21: "their clinical experience is perhaps not so much that they must do too much at that stage" "instead of, for example, providing tuition in a University context or hospital context, one can provide the same tuition in a clinic...the same outcomes"</p> <p>30: "must limit to what the guys can understand at that stage"</p>
			Effective time management (Sub-category B)	<p>3. "has to do with use of time.... students have enough time if they manage it correctly"</p> <p>16: "It will have to be in groups..."</p> <p>21: "that which you already do... do in the community"</p> <p>26: "matter of seeing the importance... should make time"</p> <p>27: "A person must just make a plan... everything has to do with priorities... rather omit lectures..."</p> <p>29: "I think a person will... especially if you combine it with something else... I think you will fit it in"</p>

As indicated in Chapter 4 (cf. the discussion under Table 4.13), 26.5 per cent of the total purposive sample had in-depth knowledge of one or more CBL contexts and could therefore provide noteworthy recommendations with regard to CB learning. Three respondents (numbers 4, 30 and 33) had experience of working in community care facilities for the elderly.

With respect to respondents' opinions concerning the availability of time to implement four hours of CBL during phase II of the curriculum (cf. Appendix C for the interview schedule questions 3.5 and 3.6), 15 respondents (i.e. respondents 4, 6, 7, 8, 10, 14, 15, 21, 24, 25, 26, 29, 30, 31, and 34) indicated that they did not have sufficient knowledge of the semester four programme (content and time allocations) to provide an informed opinion. Five respondents (i.e. respondents 7, 8, 13, 14, and 34) indicated that they did not have sufficient knowledge of the semester five programme. Therefore less respondents (n=34) were of the opinion that they had inadequate knowledge of the semester five programme than was the case for the semester four programme. The location and type of trainee influenced the definition of community-based learning (cf. the comments of respondents 12, 14, 18, 20, and 21 in Table 5.1). Three respondents (26, 31, and 33) regarded knowledge of patients' social circumstances to be an important aspect of contextual learning.

Appropriate learning outcomes (w.r.t. formulation, level and alignment with the curriculum, as indicated by respondents 4, 11, 21, and 30) and effective time management (including the use of groups, combined tasks and the avoidance of content duplication, as indicated by respondents 3, 16, 21, 26, 27, and 29) emerged as prominent requirements for implementing CBL.

### **5.3 TASK-BASED COMMUNITY-BASED LEARNING**

Table 5.2 reflects the qualitative data regarding task-based community-based learning (TB CBL)

**TABLE 5.2: TASK-BASED COMMUNITY-BASED LEARNING (TB CBL)****(Section 4 of the interview schedule)**

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)	
Authentic experiential learning	Student-related advantages	SADV	Exposure to diverse patient groups, tasks, environments and factors (Sub-category A)	1: "exposure... certain ethnic groups... religion... not allow a male doctor to even perform an ECG on her; ... that are obese .... cell phone may ring" 4: "exposure... students had to perform ECG's themselves" 14: "other outcomes that one can address, that you just cannot address in the community, because there are specific patients in context" 15: "more authentic than just presenting it to them in a classroom context" 27: "After he has seen the patient in context: then he goes and does the ECG or he does the blood pressure so that the task makes sense in terms of the patient that he saw"
			Practical application of knowledge (Sub-category B)	3. "if a person does something so that you see what you are doing, then you just understand it better than if you only hear it" 23: "not only theoretical knowledge... you must be able to apply it too"
Addresses critical cross-field/exit outcomes or competencies	Student-related advantages	SADV	Increases communication skills (Sub-category A)	1: "communication skill that they are going to develop" 3: "if you can communicate and work together with the other persons" 14: "the communication is very important"
			Promotes teamwork and collaborative skills (Sub-category B)	3: "work together" 9: "a group is always better.... must be able to correct each other" 12: "if they work together in a team"

Other advantages not applicable to TBL in the skills laboratory	Student-related advantages	SADV	Exposure to authentic situations (Sub-category A)	<p>1: "Practical problems can arise."</p> <p>2: "The skills laboratory cannot create a fully authentic environment... variable factors in the community that cannot be simulated"</p> <p>4: "true life milieu... if we e.g. at the end of a session ask the students:... sometimes surprisingly positive answers"</p> <p>7: "there are things that you can learn in the community, that you cannot learn in the skills laboratory: much more practical"</p> <p>8: "authenticity... the real clinical environment has many advantages"</p> <p>10: "learn how to work with other people .... manage time better... to... equipment that does not work"</p> <p>12: "understand the context much better... the context in a simulation "lab" is very controlled..."</p> <p>23: "get to know other disease profiles than those in the hospitals"</p> <p>29: "always different to do it in the real life situation... unpredictability of patients"</p> <p>31: "reality training... if we want to teach the students to be patient-oriented"</p> <p>32: "provide exposure to patient contact"</p> <p>34: "rural population.... They can really see what the real scene at the grass-root level is"</p>
			Promotes communication skills	<p>14: "communication aspects..... the language problems:to work with ....hmm.... translators"</p> <p>18: "communication..... patients that (speak) another language"</p> <p>20: "different to work with a model than to work with a person. It has to do with communication and attitude..."</p>
	Community-related advantages	CADV	More cost-effective	31: "More cost-effective in terms of the patient"
			Greater accessibility has a positive effect	31: "very positive if they see that they are receiving attention.... better or easier access"



Is appropriate for the preclinical phase of the UFS curriculum	Exposure	EXP	Positive aspects (Sub-category A)	<p>1: "the sooner you expose them to it, the sooner in fact they will be able to do that task on a level that you would like..."</p> <p>21: "very good to expose them to that environment"</p> <p>3. "that they can place more emphasis on the clinical things that they are going to do later... if you can emphasise it for them before the time..."</p> <p>6: "consolidates the theory.... that they understand it better too"</p> <p>23: "You can do task-based learning from semester 1: it is done worldwide like that"</p> <p>27: "the more they can do, the more motivated they are"</p> <p>28: "It is probably the best time"</p> <p>26: "We have got several senses... you are touching flesh and blood... you are communicating verbally with somebody; you are visually seeing somebody; you are touching a living person"</p>
			Negative aspects (Sub-category B)	<p>2: "perhaps do not have enough knowledge and experience to be able to handle the changeable environment of the community: they should have more stable, structured cases"</p> <p>8: "with limited clinical experience I do not know of how much value it will be in the preclinical phase"</p> <p>15: "students may not understand what the clinical relevance is thereof"</p> <p>17: "... I am not entirely sure .... whether they are already really completely ready always for that type of task-based learning"</p> <p>21: "perhaps not so clinically adept..."</p>
			Prerequisites for implementation (Sub-category C)	<p>4: "not try to provide exposure to everything that will follow in the clinical years"</p> <p>15: "must be made very specific and perhaps explained in context.... to be appropriate"</p> <p>20: "not any task.... It will be specific things"</p>

The UFS challenges can be overcome	Challenges that raised concern	CHA	<p>3: "there are always financial implications everywhere"</p> <p>12: "little administrative and political will" "must the University transport them... insurance..." "ethically and legally...legal disposition"</p> <p>13: "ethically.... transport...it especially has to do with the finances"</p> <p>17: "transport and costs... All the students do not have cars"</p> <p>18: " hidden obstacles... students that are going to be sick or they miss it for some or other reason" "....transport..."</p> <p>19: "It depends on the University and the Province. Ethical things are not in our hands"</p> <p>20: "It is tough... with our limited resources...."</p> <p>21: "....cost implications..."</p> <p>22: "do not have the place...I do not think there are enough personnel (with the workload).</p> <p>24: "cost implications"</p> <p>25: "available time"</p> <p>30: "... is there really transport for small groups to and fro? .... they cannot be many, because a clinic cannot accommodate many....." "...is there enough money?.... these mini-buses of ours cost thousands of rands" "then the one bus broke down: then the whole class waits.....when you must transport people, you are dependent on external factors.... The driver is sick.... everyone does not have their own transport"</p> <p>31: "available time in the programme" "cost implications" "from experience often have problems to obtain state transport or University transport....." "ethical aspects... everyone involved.... before a student examines a patient, he must inform the patient ... informed consent" "several posts that are not necessarily filled....."</p> <p>32: "transport costs" "ethical aspects.... only physical examinations....."</p> <p>34: "time-wise ..... resource-wise ..."</p>
	Possible solutions	PS	<p>7. "can be addressed with the necessary policies"</p> <p>14: "if the necessary political will is there in the school"</p> <p>".... with reference to personnel and available time, where you let smaller groups rotate"</p> <p>18: "must complete a log book" "must be planned very well..... rules and regulations must be planned in advance"</p> <p>21: "nearer places..... not have to go away for weeks.... can stay in their homes or in the hostel..... approximately an hour's drive from Bloemfontein"</p>

			<p>23: "We must just get the will... if you plan the thing"</p> <p>27: "...plan carefully and people must buy into the process"</p> <p>30: "...if the political money power is behind it...if you throw enough money on a problem...."</p> <p>31: "planning of the curriculum...." "In Bloemfontein, specifically, our contact points.... Our clinics outside, not so far..." "have bus transport for the students.... can organise and which can include the lecturer...." "all available posts will have to be made available and enough personnel employed..."</p>
The advantages exceed the disadvantages in the preclinical phase	Exposure	EXP	<p>1: "...has to do with exposure..."</p> <p>14: "will prepare them better for the work place..."</p> <p>23: "we profess: we teach our students in context, but we do not really do it"</p> <p>29: "more advantageous to work with real patients than to sit in a laboratory... to learn interpersonal skills.... .to be exposed to that"</p>
	Pre-requisites for support of this statement	PRE	<p>11: "must be integrated... for the outcomes per module and also for the programme outcomes"</p> <p>12: "depends on the task itself: how appropriate it is"</p>
	Reasons for not supporting this statement	RNS	<p>2: "are alternatives that provide better options.... skills laboratories"</p> <p>8: "there are certain things that a person can do 'on site' in a skills laboratory...."</p> <p>15: "...I would like more information...."</p> <p>18: "hidden obstacles" "Unfortunately one will only, when such a programme runs, find out (but) what are the disadvantages?"</p> <p>20: "if you omit time somewhere, you pay a price"</p> <p>28: ".....I cannot say how it weighs up against the other things that you do there"</p> <p>30: "You do not know how much money it will cost"</p>

<p>TB CBL in the UFS preclinical phase: respondents' general personal attitudes/ opinions</p>	<p>Prerequisites for success</p>	<p>PRES</p>	<p>3: "orientate the student(s) in such a way that they realise the importance thereof"  13: "... must not take away too much time from the normal teaching.... It must not be dominant...."  30: "..... many people do not know where MUCPP is, have never been in Batho or Freeletsong... Where will the student stand? Where will the student sit? Who is going to manage him? Are you going to employ extra personnel?"  31: "if it is a clinical assignment.... e.g. go and measure the blood pressure of... of ten persons....then I think it can work very well"</p>
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As concluded in Chapter 4 (cf. the discussions under Tables 4.6 and 4.7), all interviewees agreed that TB CBL is a valuable form of experiential learning and addresses certain critical cross-field learning outcomes. The definition of TBL had a significant impact on the answers to Question 4.5 of the interview schedule. Five respondents (15, 19, 28, 29, and 34) stated that they required more information in order to express an opinion on the practicability of TBL in the undergraduate medical curriculum. Fifteen respondents (1, 2, 3, 4, 7, 9, 10, 12, 14, 16, 21, 23, 27, 31, and 32) indicated that TBL would be practicable if certain obstacles (cf. Table 5.2) could be overcome.

Student-related advantages of TB CBL include exposure to diverse patient-related factors (e.g. ethnicity, religion, gender and body mass index, as expressed by respondents 1 and 14), the environment (e.g. cell phones, as expressed by respondent 1) and relating the task to the specific patient (respondent 27). The practical application and understanding of knowledge (including knowledge of rural settings and disease profiles in the community) was also emphasised. Communication (respondents 1, 3, and 14) and teamwork (respondents 3, 9, and 12) emerged as important critical cross-field/exit outcomes of TB CBL.

Significant student-related advantages of TB CBL (as opposed to TB learning in the skills laboratory) are the exposure to variable, authentic community-related factors (respondents 1, 2, 4, 7, 8, 12, 23, 29, 31, 32, and 34) and the development of interpersonal, time management and problem-solving skills (respondent 10). Community-related advantages include potential cost-effectiveness and the perception of the community that they have greater access to electrocardiography and that their health needs are receiving attention.

Regarding TB CBL in the preclinical phase, experiential learning promotes consolidation and understanding of the theory, emphasises the future clinical applications thereof and motivates students (respondents 6, 3, and 27 respectively). However, five respondents (2, 8, 15, 17, and 21) pointed out that students' limited prior clinical experience may detract from the potential benefits of early patient exposure. Three respondents (4, 15, and 20) asserted that specific, well-delineated clinical tasks are a prerequisite for implementation of TB CBL in the preclinical phase.

Notable UFS challenges that raised concern were transport (respondents 12, 13, 17,18, 30, 31, and 32), finances (respondents 3, 13, 17, 21, 24, 30, 31, and 32), the ethical aspects (respondents 12,13,19 and 31), the availability of personnel (respondents 22 and 31), curriculum time constraints (respondents 25 and 31), student and driver absenteeism (respondents 18 and 30) and available clinic space (respondents 22 and 30). Possible solutions (for addressing these challenges) identified by respondents, in order of respondent frequency, included sound planning (respondents 18, 23, 27, and 31), appropriate policies and regulations (respondents 7 and 18), nearer locations (respondents 21 and 31), the necessary administrative and political will in the medical school for resource allocation (respondents 14 and 23), the motivation of stakeholders (respondent 27), the use of smaller student rotational groups (respondent 14), the use of student log books (respondent 18), the use of bus transport for students and lecturers (respondent 31), and the filling of all available personnel posts (respondent 31).

Exposure to real-life patients (related to future employment responsibilities and the acquisition of interpersonal skills) was a prominent advantage cited by respondents (1, 14, 23, and 29). Requirements for support of this statement were that the task and its associated outcomes should be appropriately integrated into the existing M.B.,Ch.B. programme (respondents 2, 8, 15, 18, 20, 28, and 30).

Four respondents (15, 18, 28, and 30) could not, due to a lack of substantiated information, support an assertion that the advantages of TB CBL outweigh the disadvantages in the preclinical phase. Two respondents (2 and 8) did not support this assertion because they opined that certain learning tasks could adequately be mastered in a "skills laboratory".

Respondents' general personal perspectives regarding the feasibility of introducing TB CBL in the UFS preclinical phase was that it was dependent on certain student-related (respondent 3), curriculum-related (e.g. time, cited by respondent 13), resource-related (e.g. venue and staff, cited by respondent 30) and task-related factors (respondent 31). This information assists in answering the research question "What are the generic, context-specific and task-specific issues that will inform decisions regarding community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum?" that is related to the first research objective.

## 5.4 CONTEXTUAL ASPECTS OF ELECTROCARDIOGRAPHY LEARNING

Table 5.3 reflects the qualitative data regarding the contextual aspects of electrocardiography learning.

### TABLE 5.3: CONTEXTUAL ASPECTS OF ELECTROCARDIOGRAPHY LEARNING

(Section 6 of the interview schedule)

Section 6 of the interview schedule assisted in answering the research question "What are the attitudes and opinions of Faculty members regarding community-based electrocardiography learning in semesters four and/or five?"

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)
ECG elements that should be taught in the preclinical phase	Required foundational knowledge	RFK	31: "co-ordinated with the anatomy and the electrophysiology of the heart" 32: "cardiovascular... have done history and basic examination methods at that stage...".
	Specific content recommended	SCR	3: "understand the value thereof" 14: "how to record it practically and check it technically that the calibration and the speed etc. are correct... basic components....to be able to determine the axis, the rhythm..... that it is anatomically linked to the heart.... from a myocardial ischaemia to an infarction and recovery ... atrial fibrillation... in the clinical years you can proceed to conduction blocks, to bundle branch blocks, to flutters... together with the management" "The next little step up... basic electrolyte disturbances such as hyperkalaemia and hypokalaemia..." 15: "myocardial infarction.... basic arrhythmias.... e.g. atrial fibrillation" 17: "infarction" 18: "normal electrocardiography with the limited abnormalities must definitely be started as early as possible"

		<p>21: "a ventricular fibrillation or an atrial fibrillation"</p> <p>22: "bradycardia or a tachycardia, extrasystoles... atrial abnormalities such as a flutter.... an atrial fibrillation"</p> <p>27: "atrial fibrillation, ventricular tachycardia, ventricular fibrillation and I think an atrial flutter...basic conduction blocks: a third degree conduction block ...bundle branch blocks... an acute myocardial infarction.... a bradycardia and a tachycardia..."</p> <p>28: "ST segment elevation infarction.....a right axis and a left axis, a bundle branch block pattern...."</p> <p>"Atrium fibrillation... extrasystoles..."</p> <p>29: "life-threatening things.... such as ventricular tachycardias and fibrillation.... The most common things.... such as atrial fibrillation and then also like myocardial infarction"</p> <p>30: "speed and rhythm and infarction.... fibrillation..... hypertrophy... a STEMI pattern..... blocks."</p> <p>31: ".....first look at the slow arrhythmias: the conduction blocks are extremely important." "The fast arrhythmias: atrial fibrillation... ventricular fibrillation and ventricular tachycardia that kills patients"</p> <p>32: "....ventricular extrasystoles.... ventricular tachy- and ventricular fibrillation... all the ischaemic images.... the STs and all those things.. "</p> <p>33: Tachy-arrhythmias... and also bradycardias.... myocardial infarction....</p> <p>34: "ischaemic changes, ventricular fibrillation..... cardiac arrest... ventricle tachycardia..., asystole.... pulseless electrical activity..... the four different types of cardiac arrest"</p>
	General participant suggestions	<p>GPS1</p> <p>1: "important to teach people a few abnormalities.... be able to draw a basic conclusion"</p> <p>10: "not too many abnormal things... the normal things must be consolidated much better than anything else"</p> <p>14: ".....that we teach them so basically that everyone is strong in those things...so decrease the content..."</p> <p>23: "...you teach the normal. The abnormal you can give a little of..."</p> <p>26: "they need to get used to the normal..."</p> <p>27: ".... not stand isolated in the preclinical phase"</p> <p>28: "... something happens between when you teach them and here where they reach the fifth year... they have forgotten everything by the time they get here... The ordinary ECG: they do</p>



			<p>not know how to approach it..."</p> <p>"... as soon as you come to specific diagnoses I do not think they can place it contextually, if they do not even know what an infarct is, why it changes and how it changes..."</p> <p>"not specific diagnosis-linked things such as acute infarction, ASD..."</p> <p>29: "not too much, too fast..."</p> <p>31: "...I assume it is coordinated with the anatomy and electrophysiology of the heart"</p> <p>"...you must first understand the normal very well. And then the abnormal is probably the general abnormalities... such as e.g. myocardial infarction and arrhythmias..."</p> <p>32: "It depends what exactly they have already learnt: cardiovascularly.... history and basic examination methods.... they can learn conduction blocks later"</p>
ECG in the preclinical phase should preferably be taught by lecturers with clinical ECG experience	Clinician as lecturer: advantages	CLA	<p>3: "... can help students very clearly with their experience there, if they ask something... "</p> <p>4: "... will be very difficult for someone who does not have the clinical experience to connect the clinical presentation and the ECG registration and also then with the further management of the patient..."</p> <p>8: "... know what the students must learn... what is applicable to the clinical environment"</p> <p>13: "a clinician has a little more practical experience with patients.... people with problems"</p> <p>18: "to attach a case study to it and it can easily clarify it from your own clinical experience and make it more authentic for the student: why it is important what he must learn now"</p> <p>20: "In the clinic it is a little clinical, interesting content that he adds"</p> <p>21: "I think they are the best equipped... "</p> <p>22: "... when you start with abnormalities... good that a person, who is in the clinical world, talks about it"</p> <p>23: "Otherwise you cannot link the theory nicely to the practical"</p> <p>27: "can give in the context of a clinical case on which he can expand ... does not necessarily have to be a clinical doctor: it can.... hh..... be a paramedic, for example".</p> <p>30: "..... he must have clinical experience"</p> <p>31: "otherwise you cannot convey the context to the student... you can verify it with your clinical contact..."</p>
	Reasons why a non-clinician will suffice	RNS	<p>7: "...they are going to... hhh.... anyway get the practical experience of that in their clinical years"</p> <p>15: "often it is difficult for clinicians to ..... become involved, to a large extent, in the preclinical</p>

			years" 20: "physiologists that understand what is going on can also provide very good tuition.... because it is pattern recognition, it is an understanding of Physiology" 22: "In the basic principles...yes, it can be covered by the Physiology"
	General participant suggestions	GPS2	8: ".....can almost be presented in a simpler way... perhaps it will help with retention" 14: "teaching skills of the person.... more important than the clinical background" 15: "should a programme be compiled or a curriculum be developed, someone who does have clinical experience of electrocardiography should be involved... in an advisory capacity..... and perhaps be involved in.... the assessment... can even think of involving people from Family Medicine...." 30: "it sounds as if it also must not be a super specialist..." 34: "... not theoretical like the cardiologists"
ECG is appropriate as community-based learning task for undergraduate medical education	Challenges and prerequisites for success	CPR	12: "many of the state institutions would, for example, not have ECG machines" 23: "very appropriate, provided the apparatus is available...." 29: "... availability of apparatus... " 32: "many of the clinics will not have ECG machines" 18: "Who is going to do the interpretation when they do it on a patient?... Who is going to refer that patient?" 27: "the supervisor.... have they got sufficient knowledge to teach it?" 30: "so he must take a 'try' on the registration and someone else must be nearby to 'supervise'.... If you are in the peripheral areas, then you usually do not have supervision" 14: "a person must keep in mind what do I want to achieve with the session..... communication skills... help to position someone" 26: "is not... hmm... a tool that you can say ....you are maybe screening for something or another... have to select patients"
	Other suitable community-based tasks	OST1	14: "... draw blood... " 26: "can do urine, for example: it is cheaper" 32: "blood pressure, a more basic thing that is more readily available"
Most preclinical phase ECG learning	Community-specific outcomes	CSO	4: "technical problems that are absolutely unique to certain patients in environments..." 14: "communication... work with the patient, how you approach it,....how I introduce myself .... in an 'authentic condition', such as for example, a clinic..... how I use that 'skill' as a doctor in

outcomes can be addressed in the clinical skills and simulation units			real life ... 'consent.... positioning, work with a patient that does not necessarily comply, whose BMI is perhaps very high....To be able to apply the skill in a broader context...." 20: "you can learn much with simulation, but the one thing that you cannot learn is to communicate with a live patient...." 30: "some people are fat and some are thin....landmarks so 'contorted' that you do not know where to put (the suction cups). And those things you are not going to get on a manikin"
	General participant suggestions	GPS3	12: "if it can be combined ... with other tasks" 14: "very handy to have a follow-up session in the community...." 15: "must perhaps be a combination: in the clinical skills unit and in the community" 16: "students are first assessed and do the necessary reflection ... are assessed at the end of semester four and again at the end of the first term of semester five... the students will reflect on these two assessments..... to make them more ready for community-based electrocardiography, that they then can possibly do at the end of semester five or beginning of semester six ... first by going through an assessment opportunity and reflection, to ensure that wrongful practices are not learnt, for example, by too early exposure to community-based ECG specifically." "...number of students... will just have to investigate it .... may be possible that a clinical staff member is already in a particular clinic..."
	Other suitable community-based tasks	OST2	27: "blood pressures... put up 'drips', draw blood...look at the nails, look at the spleen, look at the liver..."
The advantages of community-based ECG learning in semesters four and /or five do not justify the transport and tuition-related costs	Positive influencing factors	PIF	10: "In combination, I think, it definitely justifies it" 13: "CBE is also a requirement of the Council..." 14: "....a lot of good things will come out of it, with the broader outcomes" 23: "plan properly"
	Negative influencing factors	NIF	2: "controlled situations that are difficult in the community..." 4: "fine balance between the achievement of the outcomes and the costs..." 20: "perhaps not have an ECG machine or a working ECG machine ..." 27: "ECGs cost a lot of money...there are no stickers; the ECG machine is broken..."

The advantages of community-based ECG learning in semesters four and /or five do not justify the extra time and/or staff required	General participant comments	Positive comments and solutions	PC 12: "If it can be combined with something else..." 13: "will help to promote integration..." 18: "(A trial period) will be able to answer some of these questions..." 22: "must make plans..." 23: "Kimberley.....It is other personnel that will perform the work there... personnel that have students outside the Free State: monitoring role" 28: "go and look in your curriculum: how much time it will take..."
Negative comments		NC 8: "lends itself very well to the clinical years..." 29: "personnel availability" 30: "will prevent a lot of guys from performing their work"	
Another CVS-related task will be more suitable for CBL in semesters four and /or five	Combine with other tasks	CWOT	3: "...cannot just do one thing in, in isolation" 4: "that another task can be linked to, for example, an ECG task" 12: "...if it is linked to other tasks, I think it is worth it" 14: "rather do two or three tasks, that the students learnt in the 'skills lab' " 15: "not only do an ECG recording..." 18: "the one cannot really be without the other" 27: "if you can do it and take the patient's blood pressure..."
	Tasks deemed more suitable	TDMS	10: "...blood pressure..." 14: "... draw blood... blood pressure measurement... BMI..... hip-waist ratios....." 15: "blood pressure measurement..... cardiovascular risk assessment" 18: "blood pressure measurement" 21: "cardiovascular history and/or health information.....counselling" 22: "clinical examination of your cardiovascular system remains primary" 25: "... a blood pressure..." 27: "cardiovascular examination...blood pressure, determination of the patient's volume status, with JVP and all the other things together..." 28: "...blood pressure...assess the pulse... history" 29: "cardiovascular risk assessment..... blood pressure" 30: "peripheral oedema or to look for signs of cardiac failure.....glucoses" 31: "a good basic history ... a very complete history of the cardiovascular system.... take blood pressure and....and pulse and listen to the heart..."

			<p>32: "...blood pressure..."</p> <p>33: ".....blood pressure.....urinalysis.... fundoscopy"</p> <p>34: ".....counselling about the results of the smoking... plus about the obesity and the exercise... walking.... lifestyle modifications related to the cardiovascular system"</p>
Community-based ECG learning can be implemented in the preclinical phase of the UFS curriculum	Determining factors	DF	<p>3: "If the facilities are there"</p> <p>7: "personnel and equipment, resources"</p> <p>10: "Some places... do not have all the equipment..."</p> <p>12: "....with the equipment that is not there....."</p> <p>15: "number of personnel.....how often..."</p> <p>20: ".....the logistics will make it difficult.....attitude. You can do everything that you want to....."</p> <p>25: ".....available time..."</p> <p>28: ".....how it fits in with the preclinical curriculum: that you do not move other things out, that are perhaps important for it ...."</p> <p>31: "availability of personnel, transport, money etc."</p> <p>32: "I do not think the logistical things are in place"</p> <p>34: "..... you need the programme director....."</p>
General attitude and opinion regarding community-based ECG learning in the UFS preclinical phase	Reasons for support	RS1	<p>1: "exposure...."</p> <p>3: ".....the more they realise the importance thereof....."</p> <p>4: "...it will also convey to the students the seriousness and the importance thereof and which value the ECG can add..."</p> <p>29: "'real life experience' is better than ..... than with models and dolls."</p>
	Concerns	C1	<p>14: "outcomes must be written correctly.....otherwise they only become focussed on the skill and not on the context of the patient ... focus on consent... interaction... language.... building rapport, clinical communication...."</p> <p>28: "must be limited to the basic things that are understandable at that stage..."</p> <p>29: "must go and look very carefully at the group size and the availability of support personnel"</p> <p>"you perform an ECG and there is an abnormality.... then someone must do something about it"</p>

Community-based ECG learning can be implemented in the UFS clinical phase	Reasons for support	RS2	12: "it can, for example, be linked to the..... elective at Family Medicine.... in a community-based rotation at Internal Medicine..." 28: "...if they perhaps rotate at Family Medicine..." 20: "very stimulating to really do something" 30: "Clinical phase: they already go for other reasons..... The system already exists for it"
	Concerns	C2	28: "...I do not think it is practicable...we experience problems to get everything done in the hospital .... cardiology rotation... in the time that we see the students, it is not possible to also send them out..." 30: "... the nearest they get into the community is.... is Pelonomi"

As stated in Chapter 4 (cf. the discussion under Table 4.13), based on their stated theoretical and practical knowledge of electrocardiography, at least 68 per cent of the respondents were in an advantageous position to provide useful information regarding electrocardiography and ECG learning. Respondents 14, 31, and 32 emphasised the importance of foundational knowledge (i.e. anatomy, cardiac electrophysiology, cardiovascular history taking and the basic cardiovascular examination) for effective electrocardiography learning. General participant suggestions regarding appropriate ECG learning content in the preclinical phase included that students should become very proficient in the characteristics of a normal electrocardiogram before advancing to abnormal patterns (respondents 1, 14, 28, and 31).

Specific ECG elements identified by respondents that should be taught in the preclinical phase were (in order of frequency mentioned):

1. Rhythm: atrial fibrillation, atrial flutter, ventricular fibrillation (14, 15, 21, 22, 27, 28, 29, 30, 31, 32, 33, and 34)
2. Typical ECG characteristics of myocardial ischaemia, a myocardial infarction and recovery from a myocardial infarction (14, 15, 17, 27, 28, 29, 30, 32, 33, and 34)
3. Rate abnormalities: bradycardia and tachycardia (22, 27, 29, 30, 31, 32, 33, and 34)
4. Basic atrioventricular and bundle branch conduction delays (27, 28, 30, and 31)
5. Extrasystoles (22, 28, and 32)
6. Determination of the cardiac axis (14 and 28)
7. The practical recording and technical checking of the ECG: basic ECG components, calibration and speed etc. (14)
8. Basic electrolyte disturbances, such as hyperkalaemia and hypokalaemia (14)
9. The four different types of cardiac arrest (34)
10. The clinical value of electrocardiography (3).

Concerning the specific preclinical phase related ECG learning content (Question 6.1 of the interview schedule), four respondents (27, 28, 30, and 31) regarded cardiac conduction blocks to be appropriate, but three respondents (14, 32, and 33) specifically indicated that these abnormalities should be taught after the preclinical phase.

A prominent advantage of using a clinician as lecturer, identified by respondents, is their clinical experience (respondents 3, 4, 13, 18, 30, and 31) which enables them to link the theory to the clinical application (respondents 4, 8, and 23), clarify learning content (respondents 3 and 18) and appropriately expand on the learning content (e.g. with information on patient management) by using case studies and providing additional interesting information (respondents 4, 18, 20, and 27). However, a non-clinician may suffice because the learning content includes basic Physiology-associated principles (respondents 20 and 22), the practical application will be taught in the clinical phase (respondent 7), and clinicians cannot easily be involved during the preclinical phase (respondent 15).

General participant suggestions regarding community-based ECG learning in semesters four and five are that a person with effective teaching skills should present the learning content in a simple and practical way (to enhance knowledge retention), with the assistance of clinicians who are involved in curriculum development and assessment (respondents 8, 14, 15, 30, and 34).

Important prerequisites for success in using ECG as a community-based learning task for undergraduate medical education are availability of ECG machines at the teaching venues (respondents 12, 23, 29, and 32) and the availability of appropriately qualified supervisors who can refer patients for further management, if necessary (respondents 18, 27, and 30).

Suitable non-ECG community-based learning tasks identified by respondents were to draw blood (14), test urine (26) and measure blood pressure (32). Seven respondents recommended combining an electrocardiography task with other learning tasks.

Other cardiovascular system (CVS)-related tasks regarded by participants to be more suitable for CBL in semesters four and /or five (in order of frequency mentioned) were blood pressure measurement (10, 14, 15, 18, 25, 27, 28, 29, 31, and 32), the cardiovascular examination (22, 27, 28, 30, and 31), the cardiovascular history, including the risk assessment (15, 21, 28, 29, and 31), cardiovascular health counselling (21 and 34), body mass index and hip-waist ratio determination (14), drawing blood (14), glucose determinations (30), urinalysis and fundoscopy (33).



Positive and negative factors influence the decision whether the advantages of community-based ECG learning in semesters four and five justify the associated transport and tuition-related costs.

The following positive factors were stated:

1. ECG can be combined with other learning tasks in the community (10).
2. CBE is also a requirement of the Council (13).
3. Broader learning outcomes can be achieved (14).
4. Good planning can make it possible (23).

The following negative factors were stated:

1. Controlled situations are difficult to achieve in the community (2).
2. There is a fine balance between the learning outcomes and associated costs (4 and 27).
3. The availability of functioning ECG machines is a concern (20 and 27).

Prominent participant suggestions for solutions regarding the decision whether the advantages of community-based ECG learning in semesters four and /or five justify the extra time and/or staff required are that planning (22), a trial period (18) and analysis of the time required (28) will clarify this. However, personnel availability and the impact on existing clinic personnel was a concern (29 and 30).

Prominent determinants regarding the implementation of community-based ECG learning in the preclinical phase of the UFS curriculum constitute (in order of frequency stated) the availability of facilities and equipment (3, 7, 10, 12, 20, and 32), personnel (7, 15, and 31), curriculum time and planning (25, 28, and 34), and transport and money (31).

Respondents' general attitude and opinion regarding community-based ECG learning in the UFS preclinical phase was influenced by positive factors and concerns. The two prominent positive factors stated were that students would be exposed to real life contexts (1 and 29) and that the importance and value of electrocardiography would be conveyed to the students (3 and 4). Two major concerns were the formulation of

appropriate learning outcomes (14 and 28) and availability of personnel for appropriate patient management (29).

Regarding the possible implementation of community-based ECG learning in the UFS clinical phase, the single prominent positive factor stated was that this learning can be linked to existing community-based rotations (12, 28, and 30). This should make the logistical arrangements easier in the clinical phase, because currently no such rotations occur in semesters four and five. However, one respondent (28) did not think that this was practicable. Respondent number 30 commented that, during the clinical phase, students currently only perform “community-based learning” at Pelonomi Hospital. However, the possibility that semester four and /or five students may be able to rotate with more senior students and share logistical resources such as transport, equipment and personnel where possible, should be investigated.

During the interviews it became evident that the curricular phase during which a particular task can be introduced and the practical complexity of the task are very important determinants regarding Faculty decisions related to community-based learning. The more complex the logistical arrangements associated with a community-based learning task are, the more appropriate it will be to introduce the task at a later stage in the curriculum, where the task can possibly be combined with other clinical tasks for which the student has the necessary foundational knowledge.

#### **5.5 RESPONDENTS’ GENERAL COMMENTS REGARDING THE IMPLEMENTATION OF COMMUNITY-BASED ELECTROCARDIOGRAPHY LEARNING DURING SEMESTERS FOUR AND FIVE**

Table 5.4 reflects the most important themes derived from the respondents’ general comments regarding the implementation of CB ECG learning during semesters four and five.

**TABLE 5.4: GENERAL COMMENTS REGARDING THE IMPLEMENTATION OF CB ECG LEARNING DURING SEMESTERS FOUR AND FIVE (Section 7 of the interview schedule)**

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)
Benefits of early exposure	Student-related	SR	<p>10: "very good for the students to see the things, then they remember it much better."            13: "will promote integration.... because they already get to do with patients earlier ... learn in context"            14: "patients that do not cooperate, that do not necessarily understand the language, that do not move so fast and experience difficulty getting on to the bed... have another body habitus ... It provides insight into how it is in real life to use these skills"            17: ".....training will be so much better and... especially with cardiac diseases etc. that cause so much morbidity and mortality....."            21: "I think the students will also like it: ..... it will stimulate them... ."            26: "...the sooner the students know about the complications of common, chronic conditions and how to sort of..... hmm.....diagnose.....like early signs of maybe abnormal ECG...., the better...."            31: "...there is nothing that can influence contact and practical application of your learning more positively than contact with patients in the community.... the patient's attitude...."            32: "It motivates them....."</p>
	Community-related	CR	<p>1: "these students can perhaps pick up patients that did not even know that they have a cardiovascular problem ...."            7: "...perhaps the community will then also benefit from the learning....."            13: "'screening'..... a person can perhaps pick up something in such a way ...."            26: "in the community here in South Africa hypertension is a real.....high up on the list and diabetes is high up on the list and we know those two are both risk factors for heart disease....."</p>

Prerequisites or challenges regarding implementation	Material resources-related	MRR	<p>4: "They will also require a good clinical mentor in this regard...it must be structured. The outcomes must be written very clearly"</p> <p>5: "transport.... supervision"</p> <p>7: "must do a needs analysis....equipment... money.... transport' "</p> <p>10: "small group must be exactly so big that you can go with one 'transport', or two.... a session of six hours...."</p> <p>12: "there are many facilities that just do not have adequate equipment to teach students....hmm....well enough...."</p> <p>13: "it is going to cost money, like transport, accommodation, if it is in another.... let's say Kimberley and they must perhaps stay overnight and personnel.... you are probably going to need one or two persons that can manage the thing"</p> <p>"the final interpretation ..... must be done by a consultant or some other specialist ..... can even send it electronically."</p> <p>14: "the same 'resources'..... personnel can just go and teach it at another place"</p> <p>15: "more research definitely must be done to look if it indeed will be possible ....conversion of knowledge to the practical application thereof and it will be good if a person can go and look what... what can be done to bridge that..... hmm.... gap."</p> <p>16: "the number of students that can rotate. One will just have to investigate it."</p> <p>17: "transport and costs...."</p> <p>18: "the interpretation of ECGs, especially with pathology..... Are there sufficient personnel to help that student?..... The personnel of the clinic.... influences them too"</p> <p>21: "Logistically....especially transport for the students... many times, for example, there will be no functional machine ...must then just take one with...."</p> <p>26: "look at the machines that are in the community. Are they calibrated?"</p> <p>27: "the instructor must have examples of ECGs.....you may see a few fibrillations now and then. ....that they must buy that book of Dubin"</p> <p>30: "...how much space does it take to do this thing?.... Clinics are busy.... Where did you see a machine? In casualties. ....there is a casualties department at MUCPP... and there should be a machine...The space is taken up by the HIV clinic....."</p> <p>32: "...the facilities in your clinics..... there are many clinics that do not have ECG machines...."</p>
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			33: "need to make sure the facilities' equipment is running. ..normally we run out of stickers....make sure they are there... the paper is there...it is well calibrated...the physician working there ....be able to analyse and help and interact with the students... transportation"
	Non-material resources-related	NMRR	<p>2: "clinical cases.... must be very typical cases..."</p> <p>6: "practical component must be as close as possible to the theory component, so that the one can strengthen the other... with other projects that are already being implemented".</p> <p>7: "how are you going to convey your theoretical knowledge... in practice"</p> <p>10: "do it in combination with something else.....pulse and blood pressure and .....clinical things."</p> <p>11: "make sure that it is integrated in the curriculum, that it is not separate and presented separately; it must occur in context."</p> <p>"must be constructively aligned with the outcomes of the specific M.B.,Ch.B. programme.....be integrated with the learning development and the learning material...."</p> <p>16: "to first go through an assessment opportunity and reflection, to ensure that wrong practices are not learnt..... availability of personnel, especially preclinical personnel. It may be possible that a clinical staff member is already in a particular clinic..."</p> <p>20: "Formulate good guidelines for the students as well as any other person involved..... get a simple format for the student to work according to and get a champion that will push it through."</p> <p>21: "Logistically.... A lot of organisation will go into it..... A lot of time will go into it.... .... cooperation of the clinic personnel... the identification of patients... will mainly be the responsibility of the lecturer ... take for one.... maximum two sessions into the community"</p> <p>23: "just requires planning"</p> <p>24: "it must be planned well....."</p> <p>25: "the time aspect"</p> <p>27: "a strategic plan in place...."</p> <p>28: "..... remain within context of what they can do or must do at that stage and that it fits in with your curriculum."</p> <p>29: "..... there will have to be a protocol: what do we do if a small learning group gets an abnormality and what to do and how we manage it.."</p> <p>33: "....should have more practice time... before they go and practise on a real patient....."</p>

All interviewees made general recommendations (cf. Appendix C: Section 7 of the interview schedule), although three interviewees (due to a lack of theoretical and practical ECG knowledge) did not qualify to proceed to the interview questions (concerning the contextual aspects of ECG learning) under section 6 of the interview schedule. Based on these general comments, a summary of the most prominent conclusions (reached by the researcher) is provided.

The prerequisites (determinants), challenges, limitations and influencing factors regarding the implementation of community-based electrocardiography during semesters four and five of the UFS medical curriculum are interrelated and interdependent.

There are resource related and non-resource related prerequisites and challenges regarding implementation. Important resource related challenges mentioned by participants (in order of frequency) are:

1. The availability of a competent clinical supervisor who can assist with patient management, if an abnormal ECG is encountered (4, 5, 13, 14, 18, 26, and 33)
2. Student transportation (5, 7, 10, 13, 17, 21, and 33)
3. Functional equipment and ECG consumables (7, 12, 21, 26, 30, 32, and 33)
4. Finances (7, 13, and 17)
5. Additional research regarding the needs and solutions associated with implementation (7, 15, and 16)
6. Available space at the learning sites (30)
7. Overnight accommodation in the case of distant locations (13)

Participant suggestions for possible solutions included:

1. A structured approach and clearly formulated learning outcomes (4)
2. A practical session of six hours' duration (10)
3. Sending the ECG recordings electronically for quality control of their interpretation (13)
4. That the instructor should have examples of selected ECGs and the students should buy a textbook written by Prof. Dale Dubin (27).

Non-material resources-related prerequisites and challenges regarding implementation constitute curriculum and personnel-related issues.

Prominent curriculum-related challenges include strategic planning (21, 23, 24, and 27), with an emphasis on:

1. The learning outcomes and implementation guidelines (20 and 29)
2. The level, chronology and allocated time (21 and 25), constructive alignment (6, 11, 28, and 33) and presentation of the learning content (7, 10, and 16)
3. Appropriate patient selection (2 and 21).

Personnel-related challenges involve the co-operation of clinic personnel (21) and getting “a champion that will push it through” (20).

## **5.6 A SUMMARY OF THE QUALITATIVE FINDINGS AND THEIR RELATION TO THE QUANTITATIVE RESEARCH FINDINGS AND CONCLUSIONS**

In this chapter, the qualitative results of the structured interviews were presented and discussed. Where applicable and possible, these results were correlated with the quantitative results. By virtue of their practical experience regarding medical education, electrocardiography and community-based learning, and their diversity with regard to their qualifications and occupational roles, valuable qualitative data was collected and the interviewees (as a group) were able to provide a balanced perspective regarding aspects that determine the appropriateness and feasibility of introducing CB ECG learning during semesters four and/or five of the UFS medical curriculum.

For a broad overview of the study and a preamble to Chapter 6, the qualitative results can be correlated with a summary of the quantitative results of the interviewees' responses (discussed in Chapter 4) which are presented in Table 5.5.

**TABLE 5.5 A SUMMARY OF THE QUANTITATIVE RESULTS THAT REFLECT INTERVIEWEES' RESPONSES WITH REGARD TO OBJECTIVE 2 OF THE STUDY**

<b>1. Support of CBL, task-based CBL and CB ECG learning in the undergraduate medical curriculum (preclinical and clinical phases)</b>	
For the preclinical phase, 7 per cent more interviewees were favourably disposed towards community-based learning in general than community-based ECG learning.	
Twenty-six (26) per cent more respondents supported the implementation of CB electrocardiography during the clinical phase of the curriculum than was the case for the preclinical phase of the curriculum.	
<b>Percentage</b>	<b>Characteristic</b>
94	Supported the statement "Task-based CBL is appropriate for the preclinical phase of the UFS undergraduate medical curriculum"
91	Agreed with the statement "There are other advantages of task-based CBL that do not apply to task-based learning (TBL) in the skills laboratory"
84	Agreed with the statement "The advantages of implementing task-based CBL in the preclinical phase of the UFS medical curriculum outweigh the disadvantages (such as the extra time required, cost and transport arrangements)"
75	Agreed with the statement "The challenges/obstacles/limitations of task-based CBL (such as the cost implications, available time in the programme, available staff, transport arrangements and ethical issues) can be overcome in the UFS undergraduate medical curriculum"
66	Expressed a very favourable attitude/opinion regarding task-based CBL in the preclinical phase of the UFS undergraduate medical curriculum
<b>2. Opinions with regard to the academic appropriateness of ECG as CB learning task in the preclinical phase</b>	
More participants agreed than disagreed that another cardiovascular system-related task will be more suitable to introduce as activity for task-based community-based learning in semesters four and/or five, although some interviewees suggested that electrocardiography can be combined with another cardiovascular system-related learning task in this regard.	
<b>Percentage</b>	<b>Characteristic</b>
81	Agreed that community-based electrocardiography, as a learning task, is appropriate for undergraduate medical education
61	Agreed that most of the electrocardiography-related learning outcomes for the preclinical phase can be addressed in the clinical skills unit in combination with simulation training, which renders task-based community-based electrocardiography training unnecessary
<b>3. Opinions on the way in which ECG learning in the preclinical phase should be presented</b>	
<b>Percentage</b>	<b>Characteristic</b>
91	Agreed that electrocardiography, in the preclinical phase, should preferably (if possible) be taught by lecturers who have clinical experience of electrocardiography
77	Strongly agreed that the basic elements of normal electrocardiography, with a limited number of abnormal electrocardiographic patterns, should be taught in the preclinical phase of the UFS undergraduate medical curriculum



#### **4. Opinions regarding the practicability of implementing CB ECG learning in the preclinical phase.**

With regard to semesters four and five, separately, 63 per cent of 32 respondents agreed that there is sufficient time to implement four hours of CBL in semester four of the UFS M.B.,Ch.B. curriculum

The interviewees (as a group) were not, to a large degree, convinced that the advantages of community-based ECG learning in semesters four and five justify the extra costs involved, although their responses were more favourable with respect to the non-human resource-related cost-benefit balance than with respect to the human resource-related cost-benefit balance

Although the quantitative results (cf. Chapter 4 Table 4.23) indicated that more respondents supported the implementation of CB electrocardiography during the clinical phase of the curriculum than was the case for the preclinical phase of the curriculum, the majority of interviewees were favourably disposed towards community-based electrocardiography learning in the preclinical phase, provided the practical resource-related problems could be solved. The qualitative data indicated that participants could identify other community-based learning tasks that they regarded to be more appropriate for the preclinical phase. They could also provide several practicable solutions for the resource-related and logistical problems associated with the current UFS context.

The next chapter, Chapter 6 (***Conclusions, limitations of the study, and recommendations***), provides an overview of the research performed (together with the conclusions), describes the most important limitations of the study, and includes recommendations regarding future research.

## **CHAPTER 6**

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

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#### **6.1 INTRODUCTION**

The problem that initiated the research study was that more information was required regarding the practicability of introducing community-based electrocardiography teaching and learning during semesters four and five of the UFS undergraduate M.B.,Ch.B. curriculum.

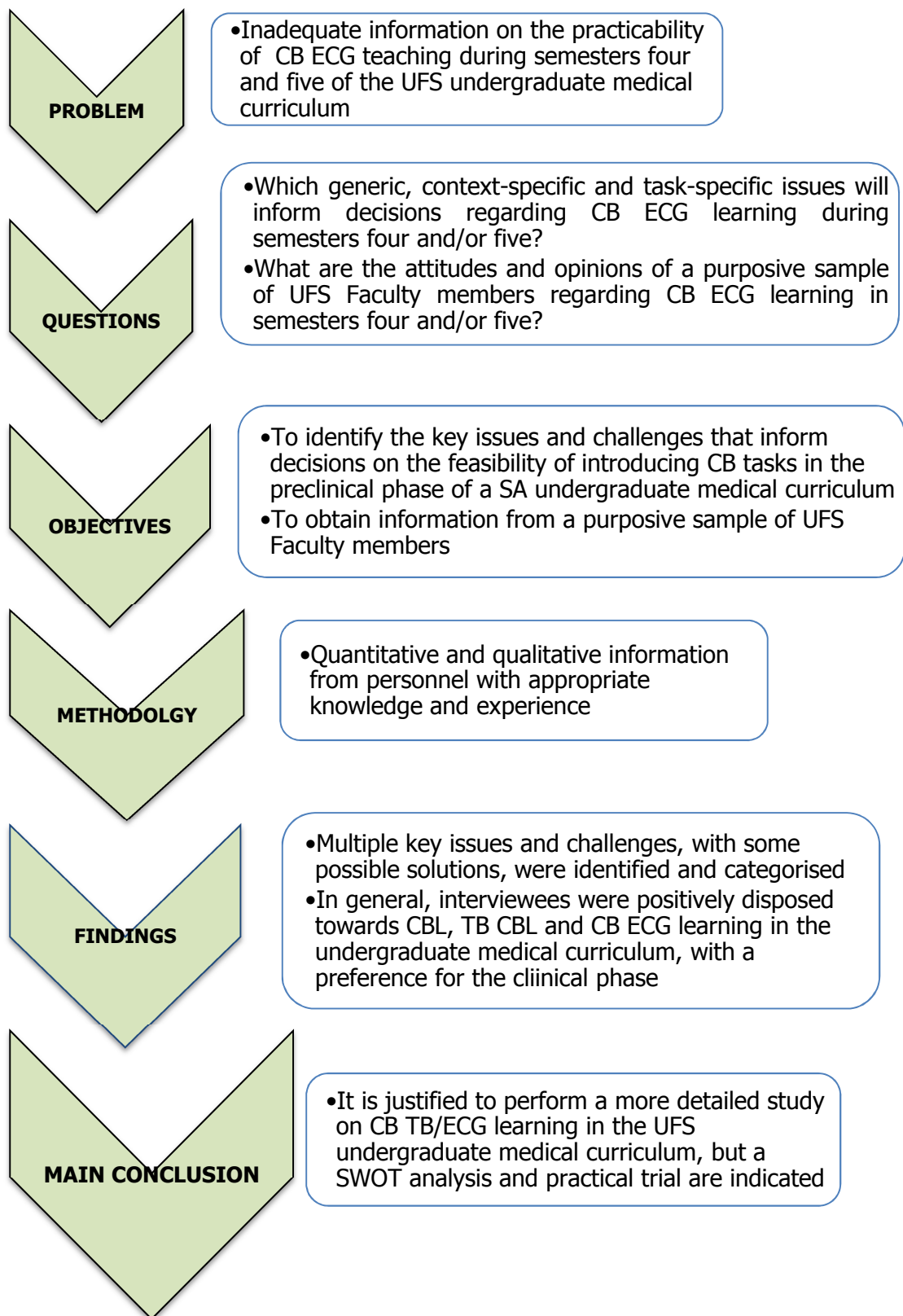
In Chapters 4 and 5, the quantitative and qualitative results of the empirical research were presented and discussed. As applicable to the research objectives presented in Chapter 1 (cf. 1.4.3), the relationships between the quantitative and qualitative results were analysed and discussed. In this chapter the researcher will document the conclusions of the study, endeavour to answer the research questions from which the research objectives were identified and discuss the limitations of the research study. Recommendations will be made with regard to task-based community-based learning (with an emphasis on electrocardiography learning) in the UFS undergraduate medical curriculum. The researcher will also suggest related topics that merit future research endeavours.

#### **6.2 AN OVERVIEW OF THE STUDY**

Figure 6.1 provides an overview of the research undertaken.

##### **6.2.1 The overall goal of the study**

The overall goal of the study (cf. Chapter 1, section 1.4.1) was to facilitate the transition between electrocardiography teaching and learning in the preclinical and clinical phases of the UFS medical curriculum. To achieve this goal, the researcher formulated the following aim and objectives.



**FIGURE 6.1: AN OVERVIEW OF THE RESEARCH UNDERTAKEN**

### **6.2.2 The aim of the study**

The aim of the study was to investigate community-based electrocardiography teaching and learning in semesters four and/or five of the UFS M.B.,Ch.B. programme, as reflected by the views of Faculty members who had the relevant knowledge and experience.

### **6.2.3 The objectives of the study**

To achieve the aim and answer the research questions (cf. Chapter 1, section 1.3), two objectives were pursued:

**Objective 1:** To identify the principal key issues and challenges that inform decisions regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum.

**Objective 2:** To obtain quantitative and qualitative information regarding the attitudes and opinions of a purposive sample of Faculty members (cf. Chapter 1, section 1.4.3) with regard to community-based electrocardiography learning in semesters four and/or five of the UFS undergraduate M.B.,Ch.B. curriculum.

## **6.3 CONCLUSIONS FROM THE STUDY**

In order to reach valid conclusions with regard to the research undertaken, it is important to make a distinction between the results and the concept "conclusion". According to the Encarta World English Dictionary (1999:394) a conclusion is "a decision made or an opinion formed after considering the relevant facts or evidence" or "an ending or the part that brings something to a close". The results constitute the research findings and provide the relevant facts or evidence from which the research conclusions are drawn. According to Hofstee (2006:157), "Conclusions are things you can deduce from your work as a whole". In this chapter a brief summary of the research findings applicable to a particular conclusion will be provided, so that a logical argument can be presented to justify the conclusion.

### **6.3.1 Conclusions applicable to objective 1**

From the literature survey (the first research method), the principal Faculty- and community-related issues and challenges were identified and classified into categories and subcategories (cf. Chapter 2 Table 2.2). The Faculty-related issues were categorised into four principal categories: Faculty policy-, sustainable resource-, learner-, and curriculum-related issues. The community-related issues were categorized into two principal categories: the patient- and location-related issues. This classification (as part of the research findings relevant to the first research objective) assisted the researcher to compile a contextually appropriate interview schedule. It can also be used to direct future research, since it would be advantageous to first address the most difficult issues, which became apparent from the results of the empirical part of the research study.

The main conclusion reached was that there are multiple dynamic and interrelated factors that influence decisions with regard to the practicability of implementing a particular community-based learning task. These factors can be classified into Faculty- and community-related issues that can be further sub-classified into human resource-related and non-human resource-related determinants. These factors should be considered in the light of the SPICES, PRISMS and DUNDEE pedagogical models (cf. Chapter 2 Section 2.2.1), which are used to plan curricula. The quality assurance requirements (including the SAQA exit level outcomes) that apply to South African medical curricula, the related quality of teaching and learning, and the sustainability of high quality education (in the long term) are significant overarching determinants in this feasibility survey.

The first research objective was therefore accomplished.

### **6.3.2 Conclusions applicable to objective 2**

Due to a paucity in currently available literature regarding electrocardiography learning in community-based settings (cf. Chapter 2), no direct comparisons could be made between the results of this study and similar studies. However, most of the Faculty- and community-related issues that were identified and categorized by the researcher

subsequent to the literature search (which was performed to pursue the first research objective), were verbalized by the interviewees.

Due to the diversity in the interviewees' theoretical knowledge, professional qualifications, occupational roles and previous occupational exposure (cf. Appendix L), useful quantitative data was collected, despite the small size of the purposive sample (n=34).

Interviewees' responses (with regard to the quantitative component of the study) related to objective 2 were analysed from four perspectives, namely their responses with regard to the different forms of CB learning pertinent to the study and the academic appropriateness, mode of presentation and practicability of CB ECG learning in the preclinical phase of the curriculum (cf. Chapter 5 Table 5.5).

In general, interviewees' responses with regard to their support of CBL, task-based CBL and CB ECG learning in the undergraduate medical curriculum (preclinical and clinical phases) was favourable, which justifies further research in this regard.

For the preclinical phase, seven per cent more interviewees were favourably disposed towards community-based learning in general than community-based ECG learning.

Twenty-six (26) per cent more respondents supported the implementation of CB electrocardiography during the clinical phase of the curriculum than was the case for the preclinical phase of the curriculum. From the qualitative data collected, the researcher concluded that this was mainly due to the fact that electrocardiography is a diagnostic procedure of which the interpretation and subsequent management of a patient is more complex than several other cardiovascular system-related learning tasks.

More participants agreed than disagreed that a non ECG cardiovascular system-related task will be more suitable for task-based community-based learning in semesters four and/or five, although some interviewees suggested that electrocardiography can be combined with another cardiovascular system-related learning task.

A large majority of interviewees were of the opinion that electrocardiography, in the preclinical phase, should be taught by lecturers who have clinical experience of electrocardiography and that the basic elements of normal electrocardiography, with a limited number of abnormal electrocardiographic patterns, should be taught in the preclinical phase of the curriculum.

Interviewees' responses with regard to the practicability of implementing CB ECG learning in the preclinical phase were moderately favourable (namely less favourable than their responses regarding the advantages and appropriateness of implementing TB CBL in the UFS undergraduate medical curriculum).

The "big five" challenges, identified from the empirical study, that determine feasibility are:

- Availability of appropriate learning sites, with the necessary infrastructure (including functional educational equipment), on a sustainable basis
- Availability of competent supervisors and supportive medical and non-medical personnel
- Availability of cost-effective and reliable transport for students
- Appropriate allocation of time in the undergraduate medical curriculum
- Adherence to appropriate ethical requirements to ensure that the health and other interests of the community are served

The "big three" possible solutions, identified from the empirical study, to meet these challenges are:

- Appropriate human and non-human resource allocation on a sustainable basis
- Strategic curricular planning, with appropriate time allocation, horizontal and vertical alignment of learning content and appropriately-formulated learning outcomes
- Refinement of Faculty policies and regulations for ethical conduct with respect to patient management

These principal issues and solutions were supported by the literature review, which confirms that they can be applied to other medical curricula that employ community-based learning (in the South African context and abroad).

The researcher concluded that the pursuit of objectives 1 and 2 provided preliminary data that will assist with establishing the feasibility of introducing community-based electrocardiography teaching and learning in semesters four and five of the UFS undergraduate medical curriculum. Although the conclusive establishment of the feasibility of introducing CB ECG learning in semesters four and /or five of the UFS undergraduate medical curriculum was not a primary objective of this study, advances have been made that can assist with future research endeavours.

#### **6.4 RECOMMENDATIONS**

Subsequent to the research undertaken, the following recommendations can be made:

- Possible solutions to increase the feasibility of implementing TB CB learning in the UFS undergraduate medical curriculum include sound planning, well-defined learning tasks with clearly formulated learning outcomes (set at the appropriate level of difficulty), appropriate policies and regulations, nearer locations, the necessary administrative and political will in the medical school for resource allocation, the motivation of stakeholders, the use of smaller student rotational groups, the use of student log books, the use of bus transport (for students and supervisors), and the filling of all available personnel posts.
- If a preliminary research study supports the feasibility thereof, CB electrocardiography learning should initially be introduced in the clinical phase, as part of existing community-based rotations, before it is introduced in the preclinical phase.
- Utilizing a combination of related learning tasks will increase the practicability and cost-effectiveness of the implementation of TB CBL in the preclinical phase.
- Inclusion of four hours of community-based learning time in semesters four and five is possible, but will require strategic curricular planning, without duplication of learning content. Small groups of students with one or two clinical supervisors should rotate at different community sites, to improve the quality of learning.



- Faculty should collaborate with the community health sector to align the performance of learning tasks to existing curricular learning outcomes, the capacity of community health care workers and the required standards of patient care.
- Regarding CB TB learning, the guidelines for appropriate ethical conduct of all the stakeholders (including the community members) should be formulated for the preclinical and clinical phases of the curriculum to protect the rights of all persons involved.
- A variety of community-based learning locations (including mobile clinics and patients' homes) should be investigated, since local clinics lack sufficient physical space for optimal student learning.
- Specific ECG elements that should be taught in the preclinical phase are (with an indication of the appropriate semester, based on the complexity thereof):
  1. The clinical value of electrocardiography (semester four)
  2. The basic ECG components and determination of cardiac rate and rhythm (semester four)
  3. The practical recording and technical checking of the ECG: calibration, speed, etc. (semester four)
  4. Rate abnormalities: bradycardia and tachycardia (semester four)
  5. The determination of the cardiac axis (semester four)
  6. The ECG diagnosis of cardiac hypertrophy (semester four)
  7. Basic rhythm abnormalities: extrasystoles, atrial fibrillation, atrial flutter, ventricular fibrillation (semesters four and five)
  8. Typical ECG characteristics of myocardial ischaemia, and a myocardial infarction (semester four), and recovery from a myocardial infarction (semester five)
  9. Basic atrioventricular (semester four) and bundle branch conduction delays (semester five)
  10. Basic electrolyte disturbances, such as hyperkalaemia and hypokalaemia (semester five)
  11. The four different types of cardiac arrest (semester five)

- Based on the foundational pedagogical theories and models discussed in Chapter 2 (cf. 2.2), community-based electrocardiography teaching should promote active and self-directed learning, accommodate different learning styles, be relevant to the community needs, be aligned with other curricular learning outcomes and tasks, and utilize multiple site locations.

Recommendations for future research include:

- The majority of the interviewees were favourably disposed towards the implementation of CB ECG in the undergraduate curriculum, with a preference for the clinical phase. Therefore the associated key issues and challenges should be investigated in a more systematic, detailed and comparative manner, using a SWOT (strengths, weaknesses, opportunities and threats) analysis. (Prominent UFS challenges that raised concern were finances, the availability of personnel, curriculum time constraints, the ethical aspects, transport, the availability of clinic space and student absenteeism.)
- A similar research study can be undertaken, to obtain the perspectives of personnel and other community members who are involved in the provision of services at community clinics.
- The perspectives of second and third year UFS medical students and a random sample of patients currently being treated at community clinics can also be explored.
- If a SWOT analysis of the key issues confirms the feasibility of introducing CB ECG in the preclinical and /or clinical phases of the programme, a preliminary short-term trial should be conducted, before officially adjusting the medical curriculum.
- Since 94 per cent of the respondents regarded task-based CBL to be appropriate for the preclinical phase of the UFS undergraduate medical curriculum, a future short-term trial study which investigates the limited use of one or more cardiovascular system-related tasks during semester four or five is justified.

## 6.5 LIMITATIONS OF THE STUDY

The researcher identified the following limitations of the study:

- Although an extensive literature search was performed, few research studies were identified that were directly applicable to community-based electrocardiography learning in the preclinical phase of South African undergraduate medical curricula. Consequently, before the commencement of the study there was no similar documented South African-based research which could alert the researcher to possible pitfalls in her research endeavours. To date, there are also no results of previous South African based research studies with which the findings of this study can be directly compared.
- Time and budgetary constraints limited the scope of the study to the UFS context. This limited the number of eligible participants (i.e. the size of the purposive sample) and only certain components of the results are generalizable to the undergraduate medical curricula of other South African medical schools and medical schools outside South Africa.
- The undergraduate medical curriculum of the UFS medical school currently differs from other medical curricula utilized in South Africa, with regard to the duration thereof and the associated structuring of the learning content. This limits the extent to which the research findings can be extrapolated to other South African undergraduate medical curricula.
- Subsequent to the completion of the empirical component of the study, two phase 2 session presenters were identified who, in addition to the researcher, fulfilled the criteria for inclusion in the study. Therefore the potential data of three Faculty members are not included in the research findings. Consequently noteworthy qualitative data could have been omitted, although the 91 per cent response rate of the invitees decreased the impact of this.
- Question 6.4 in the interview schedule contains two linked statements. This could have influenced the responses of respondents since some respondents were able to agree with the first part of the statement, but not with the second

part (cf. the discussion under 4.8.4 in Chapter 4). In an attempt to obtain trustworthy data, the researcher informed all the respondents that they had to respond to the statement in its entirety.

- Audio-recordings of the interviews were transcribed by the researcher and the content of the transcripts were verified by all the interviewees after the interviews. The audio-recordings and transcripts were also given to the study leader, who verified their content for quality assurance purposes. This was done in order to limit the extent of potential observer bias, since the same person was responsible for the interviews and data analysis. However, observer bias is always a potential limitation in mixed methods studies, since it may unintentionally influence the interpretation of the qualitative results.

## **6.6 CONTRIBUTIONS OF THE RESEARCH**

The researcher is of the opinion that the study assisted in clarifying the key challenges related to implementing task-based community-based learning in the UFS undergraduate medical curriculum, with particular emphasis on the preclinical phase and electrocardiography as learning task. Possible solutions for some of the key challenges in this regard were also identified, which can assist with the solution of the research problem.

The above-mentioned recommendations can assist with decisions regarding an appropriate strategy to conclusively determine the feasibility of introducing electrocardiography (as an example of a clinical task) in the UFS undergraduate medical curriculum.

The research findings of this study will be reported to the Phase 2 chairman, the programme director of the UFS undergraduate medical programme and the chairman of the Education and Quality Assurance Committee at the UFS School of Medicine.

The research findings and recommendations will also be submitted to appropriate South African journals and international academic journals, with a view to publication, since the information on task-based community-based learning and

electrocardiography learning may be of value to other academic institutions. If possible, the research findings will also be presented at conferences.

This study may stimulate future community-based electrocardiography-related research at other medical schools in South Africa and abroad.

## **6.7 CONCLUDING REMARKS**

In order to answer the two research questions (cf. Chapter 1, section 1.3) a literature survey and structured interviews were performed. The research findings can assist with establishing the feasibility of introducing community-based electrocardiography teaching and learning in semesters four and five of the UFS undergraduate medical curriculum, but further research is required to conclusively evaluate the feasibility thereof. These findings may constructively influence future curricular-related decisions at the UFS and initiate appropriate future research.

The majority of respondents were in favour of task-based CBL in the preclinical phase of the UFS M.B.,Ch.B. curriculum, but they identified several associated key challenges of which solutions still need to be found.

More interviewees were favourably disposed towards community-based learning in general than community-based ECG learning.

More respondents supported the implementation of CB electrocardiography learning during the clinical phase of the curriculum than was the case for the preclinical phase.

A high response rate of a diverse group of well-informed Faculty members provided noteworthy quantitative and qualitative information.

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## **APPENDICES**

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- APPENDIX A:** Letter of request (with information, consent form and list of questions) to potential participants to participate in a structured interview
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**APPENDIX A: Letter of request (with information, consent form and list of questions) to potential participants to participate in a structured interview**

Dear ..... (Name of potential participant)

**Letter of invitation with information (and consent form and list of questions as separate documents) to participate in a structured interview**

I am extending a cordial invitation to you to participate in a survey regarding undergraduate community-based electrocardiography learning, which forms part of research to be completed in partial fulfilment of a comprehensive mini-dissertation for the M.HPE degree (Magister in Health Professions Education)

The title of the research project is:

**'COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME'**

You have been identified, according to the criteria stipulated in the research protocol, to be one of the members of the Faculty of Health Sciences who is in a position to provide valuable input in this regard.

Since there are a maximum of approximately thirty potential respondents who fulfil the inclusion criteria for this study, I would sincerely appreciate your assistance in this regard. The potential respondents include personnel in the Faculty of Health Sciences who are directly involved in the administration and implementation of the UFS undergraduate medical curriculum in a senior capacity, and lecturers who are module leaders and/or session presenters for semesters four and five modules or are involved in community-based learning or are involved in teaching related to the cardiovascular system in the preclinical or clinical phases of the undergraduate medical curriculum.

No personal costs will be incurred by respondents and a gift book voucher (from *Exclusive Books* at Mimosa Mall in Bloemfontein) to the value of R100 will be

presented to each person who takes part in the structured interviews. The participant reserves the right to withdraw from the study at any time during the study. Completion of the structured interview will take approximately 30 minutes and an audio-recording will be made to ensure reliability regarding data collection. The information collected will be treated with strict confidentiality and the necessary professional discretion, and there will be no references to participants' names when the research results are reported. The researcher will address the same questions to the respondents in a predetermined order and manner, offering each individual the same set of possible responses, with an opportunity to elaborate on (or clarify) his/her answers. I include herewith a copy of the questions that will be asked in the structured interview.

I am currently involved in electrocardiography education (as lecturer and presenter of practical sessions in the Skills Laboratory) during semester four (and the assessment thereof during semester five) of the UFS undergraduate medical curriculum. Taking into account the advantages of community-based learning in undergraduate medical curricula, I would like to investigate the feasibility of introducing task-based community-based learning (with an emphasis on electrocardiography-related learning) during semesters four and/or five of the UFS undergraduate medical curriculum.

Task-based community-based learning in the preclinical phase of undergraduate medical curricula has not been widely researched in the global and South

African contexts and several challenges (such as the cost implications and availability of staff) influence the practicability thereof. Consequently, I decided to first perform a survey of the views, opinions and recommendations of certain Faculty members in this regard.

The overall goal of the study is to explore the possibility of introducing community-based learning during semesters four and/or five of the undergraduate M.B.,Ch.B. curriculum to facilitate the transition between electrocardiography learning in the

preclinical and clinical phases of the curriculum. The aim of the study is to investigate the practicability of introducing community-based electrocardiography

teaching and learning in semesters four and/or five of the M.B.,Ch.B. programme, as reflected by the views of certain Faculty members.

The results of the study will be submitted for potential publication in national and international journals.

My study leaders are:

1. Dr J Bezuidenhout (Division of Health Sciences Education Development, Faculty of Health Sciences, UFS)
2. Dr LJ van der Merwe (Department of Basic Medical Sciences, Faculty of Health Sciences, UFS)

The interviews are scheduled to take place during the period between 25 February and 30 June 2013.

My sincere thanks to you for taking the time to read this communication and for your anticipated participation. If you are available to participate in this study, please inform me by sms, e-mail or fax, so that I can arrange an appointment with you for the interview, during which I will also obtain the signed consent form from you.

You are welcome to contact me if you have any specific questions regarding the study.

Yours faithfully,

Dr. Carol Olivia Larson  
Dept. Basic Medical Sciences, Faculty of Health Sciences,  
University of the Free State, Bloemfontein 9300, South Africa

Telephone number: (W) (051)-4053893

Cellular phone: 084 4000078

Email address: [gnfscol@ufs.ac.za](mailto:gnfscol@ufs.ac.za)

Postal address: PO Box 339(G25), Bloemfontein, 9300.

(Project ECUFS no. 218/2012)

You may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS if you have any questions regarding your right as a research subject.

The contact details of the chairperson of the ethics committee are:

Ms H Strauss

Block D, Room 115

François Retief Building

PO Box 339(G40)

Faculty of Health Sciences

University of the Free State

Bloemfontein

9300

Tel: (051) 40521812

Fax: (051) 4444359

E-mail: [StraussHS@ufs.ac.za](mailto:StraussHS@ufs.ac.za)

## **CONSENT FORM**

Project title: **COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME**

I have been informed about the study (in writing) by Dr Carol Olivia Larson.

I understand the purpose of this research project and what my involvement in the study entails and that the information will be kept confidential and anonymity (regarding personal information) will be assured in the documentation, audio-taping and reporting of the research findings.

I understand that participation in this interview is voluntary, and that I may withdraw from the study at any time.

I (the undersigned) hereby, consent to participate in the interview, as indicated above, which is scheduled to take place during the period from 25 February 2013 to 30 June 2013.

Title: \_\_\_\_\_

Name(s) and surname: \_\_\_\_\_

E-mail address: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



**APPENDIX B: Brief aan moontlike deelnemers (met inligting, 'n toestemmingsvorm en lys van vrae) om deel te neem aan 'n gestruktureerde onderhoud**

Geagte ..... (Naam van moontlike deelnemer)

**Brief vir uitnodiging met inligting (en toestemmingsvorm en lys van vrae as aparte dokumente) om deel te neem aan 'n gestruktureerde onderhoud**

Ek rig hiermee 'n vriendelike uitnodiging aan u om deel te neem aan 'n ondersoek oor voorgraadse gemeenskapsgebaseerde elektrokardiografie-leer, wat deel uitmaak van navorsing wat gedoen word vir die gedeeltelike voltooiing van 'n uitgebreide skripsie vir die M.HPE graad (Magister in Gesondheidsberoepe Onderwys)

Die titel van die navorsingsprojek is:

**'COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME'**

U is geïdentifiseer (volgens die kriteria uiteengesit in die navorsingsprotokol) as een van die lede van die Fakulteit van Gesondheidswetenskappe wat in 'n posisie is om waardevolle insette te kan lewer in hierdie verband.

Aangesien daar 'n maksimum aantal van ongeveer dertig potensiële respondente is wat voldoen aan die insluitingskriteria van hierdie studie, sou ek u hulp in hierdie verband opreg waardeer. Die moontlike respondente sluit sleutel senior personeel van die Fakulteit van Gesondheidswetenskappe in wat direk betrokke is by die administrasie en implementering van die UV voorgraadse mediese kurrikulum en dosente wat module-leiers en/of sessie-aanbieders vir semesters vier en vyf modules is of wat betrokke is by gemeenskapsgebaseerde leer of wat betrokke is by onderrig wat direk verband hou met die kardiovaskulêre stelsel in die prekliniese of kliniese fases van die voorgraadse mediese kurrikulum.

Geen persoonlike onkoste sal deur respondente aangegaan word nie en 'n boek geskenkbewys (vanaf *Exclusive Books* by Mimosa Mall in Bloemfontein) ter waarde van R100 sal gegee word aan elke persoon wat deelneem aan die gestruktureerde onderhoud. Die deelnemer behou die reg om te onttrek van die studie op enige tydstip gedurende die studie. Voltooiing van die gestruktureerde onderhoud sal ongeveer 30 minute neem en 'n oudio-opname sal opgeneem word om betroubaarheid ten opsigte van dataversameling te verseker. Die navorser sal 'n kopie van die transkripsie van die onderhoud se kwalitatiewe inligting aan die respondent voorlê om seker te maak dat die data korrek gedokumenteer is. Die inligting wat versamel word sal met streng vertroulikheid en die vereiste professionele omsigtigheid hanteer word en daar sal geen melding van deelnemers se name in die navorsingsverslag gemaak word nie. Die navorser sal dieselfde vrae in 'n vooropgestelde volgorde en op 'n vooropgestelde wyse aan elke respondent stel en die respondent die geleentheid bied om kortliks uit te brei op sekere antwoorde. Hierdie vrae word as 'n aparte dokument aan u voorsien.

Ek is huidiglik betrokke by elektrokardiografie-opleiding (as dosent en aanbieder van praktiese sessies in die Vaardigheidslaboratorium) gedurende semester vier (en is behulpsaam met die assessering daarvan gedurende semester vyf) van die UV voorgraadse mediese kurrikulum. Met inagneming van die aanbevelings in die 2010 GBRSA Akkrediasieverslag en die voordele van gemeenskapsgebaseerde leer in voorgraadse mediese kurrikula, wil ek graag die moontlike implementering van gemeenskapsgebaseerde elektrokardiografie-leer gedurende semesters vier en/of vyf van die UV voorgraadse mediese kurrikulum ondersoek.

Taakgebaseerde gemeenskapsgebaseerde leer in die prekliniese fase van voorgraadse mediese kurrikula is tot op hede nog nie in die globale en Suid-Afrikaanse kontekste wyd nagevors nie en verskeie uitdagings (soos die koste-implikasies en beskikbaarheid van personeel) beïnvloed die uitvoerbaarheid daarvan. Gevolglik het ek besluit om eers ondersoek in te stel ten opsigte van die perspektiewe, opinies en aanbevelings van sleutel Fakulteitslede (deelhebbers) in hierdie verband.

Die breë doelwit van die studie is om die moontlikheid van die insluiting van taakgebaseerde gemeenskapsgebaseerde leer gedurende semester vier en/of vyf van die voorgraadse M.B.,Ch.B. kurrikulum te ondersoek, om die oorgang tussen

elektrokardiografie leer in die prekliniese en kliniese fases van die kurrikulum te fasiliteer. Die doel van die studie is om die maandelike implementering van gemeenskapsgebaseerde elektrokardiografie leer gedurende semesters vier en/of vyf van die voorgraadse M.B.,Ch.B. program te ondersoek, soos weerspieël deur die perspektiewe van sekere Fakulteitslede.

Die resultate van die studie sal voorgelê word vir maandelike publikasie in nasionale en internasionale joernale.

My studieleiers is:

1. Dr J Bezuidenhout (Afdeling Gesondheidswetenskappe Onderrig-ontwikkeling, Fakulteit van Gesondheidswetenskappe, UV)
2. Dr LJ van der Merwe (Departement Basiese Mediese Wetenskappe, Fakulteit van Gesondheidswetenskappe UV)

Die onderhoud is geskeduleer om plaas te vind gedurende die tydperk tussen 25 Februarie en 30 Junie 2013.

My opregte dank aan u dat u die tyd geneem het om hierdie brief te lees en vir u maandelike deelname aan die studie. U is welkom om vir my te kontak, indien u enige spesifieke vrae het ten opsigte van die studie. Indien u beskikbaar is om deel te neem aan hierdie studie, kontak asseblief vir my per sms, e-pos of faks, sodat ek 'n afspraak vir die onderhoud met u kan reël, waartydens ek die getekende toestemmingsvorm ook by u sal kry.

Vriendelike groete,

Dr. Carol Olivia Larson

Dept. Basiese Mediese Wetenskappe, Fakulteit Gesondheidswetenskappe

Universiteit van die Vrystaat, Bloemfontein 9300, Suid-Afrika

Telefoonnommer: (W) (051)-4053893

Selfoonnommer: 084-4000078

Faks: 051-4441198

E-posadres: [gnfscol@ufs.ac.za](mailto:gnfscol@ufs.ac.za)

Posadres: Posbus 339(G25), Bloemfontein, 9300

(Projek ETOVS No. 218/2012)

U mag die Sekretariaat van die Etiekkomitee van die Fakulteit van Gesondheidswetenskappe, UV kontak indien u enige vrae het ten opsigte van u reg as deelnemer aan die navorsing.

Die kontakbesonderhede van die voorsitter van die etiekkomitee is:

Mev H Strauss

Blok D, Kamer115

François Retief Gebou

Posbus 339(G40)

Fakulteit Gesondheidswetenskappe

Universiteit van die Vrystaat

Bloemfontein

9300

Tel: (051) 40521812

Faks: (051) 4444359

E-posadres: [StraussHS@ufs.ac.za](mailto:StraussHS@ufs.ac.za)

## **TOESTEMMINGSVORM**

Projek se titel: "**COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME**"

Ek is (op skrif) ingelig deur Dr Carol Olivia Larson oor die studie.

Ek verstaan die doel van hierdie studie-projek en wat my deelname aan die navorsingstudie behels en dat die inligting vertroulik sal bly en dat anonimiteit (ten opsigte van persoonlike inligting) verseker sal word by die opskryf, oudio-opname en verslaggewing van die navorsingsbevindings.

Ek verstaan dat deelname aan hierdie onderhoud vrywilliglik is en dat ek ter enige tyd mag onttrek van die studie.

Ek (die ondergetekende) gee hiermee toestemming dat ek sal kan deelneem in die onderhoud, soos hierbo uiteengesit, wat geskeduleer is om plaas te vind gedurende die tydperk vanaf 15 Januarie 2013 tot 30 April 2013.

Titel: \_\_\_\_\_

Naam/Name en van : \_\_\_\_\_

E-posadres: \_\_\_\_\_

Handtekening: \_\_\_\_\_

Datum: \_\_\_\_\_

## **APPENDIX C: Schedules for structured interview data collection (in English and Afrikaans)**

**Before the commencement of each structured interview the interviewer will state the following:**

**For English-speaking respondents:**

“You have been selected to participate in this research study according to certain inclusion criteria. I hereby affirm that all personal information that you provide in this interview will be managed with the necessary professionalism and confidentiality and will not be discussed with any third party, except with the study leader (if necessary). No mention of participants' names will be made in the research report. A numerical coding system will be used to ensure the confidentiality of your responses. Names or personal identifiers will not appear on the data sheets that are sent for statistical analysis. It would be appreciated if you could refrain from discussing your responses with any third party during the period during which the interviews are conducted, to provide a true reflection of Faculty members' personal views and try and optimise the validity of the research results. For certain questions you will be afforded an opportunity to comment or elaborate on your answer.”

**Undergraduate community-based electrocardiography teaching and learning**

Date of interview: DD/MM/YYYY

DD	MM	YYYY
<input type="text"/>	<input type="text"/>	<input type="text"/>

For office use

**Instructions for respondents of structured interview**

Respondent number

<input type="text"/>	<input type="text"/>
----------------------	----------------------

1 2

Please respond to every question, as applicable, taking into consideration your knowledge and previous experience of community-based teaching and learning, and electrocardiography teaching and learning.

Please answer the questions as candidly and comprehensively as possible.

**1. Participant demographic information**

1.1 Gender

1  Male    2  Female

<input type="text"/>	3
----------------------	---

1.2 Age (in years)

1	<input type="checkbox"/>	21-30
2	<input type="checkbox"/>	31-40
3	<input type="checkbox"/>	41-50
4	<input type="checkbox"/>	51-60
5	<input type="checkbox"/>	> 60

<input type="text"/>	4
----------------------	---

1.3 Institution where participant completed his/her undergraduate tertiary training

1  University of the Free State  
2  University of Pretoria  
3  Stellenbosch University  
4  University of Cape Town  
5  University of the Witwatersrand  
6  Medunsa  
7  University of Kwazulu-Natal  
8  Unitra (is currently called the Walter Sisulu University)  
9  Other (Please specify)

<input type="text"/>	5
----------------------	---

1.4 Year that participant completed his/her undergraduate tertiary education

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6	7	8	9	

1.5 Professional qualifications (Please mention all)

M.B.,Ch.B.  
 Masters degree (Please specify)   
 Ph.D (Please specify)   
 Other (Please specify)

<input type="text"/>	10
<input type="text"/>	11
<input type="text"/>	12
<input type="text"/>	13

## 1.6 Current occupational designation/position/role/nature of employment

(Please mention all that apply)

1	<input type="checkbox"/>	Junior lecturer/lecturer	<input type="checkbox"/>	14
2	<input type="checkbox"/>	Senior lecturer	<input type="checkbox"/>	15
3	<input type="checkbox"/>	Associate professor	<input type="checkbox"/>	16
4	<input type="checkbox"/>	Professor	<input type="checkbox"/>	17
5	<input type="checkbox"/>	Module leader/course co-ordinator	<input type="checkbox"/>	18
6	<input type="checkbox"/>	Senior management and administration	<input type="checkbox"/>	19
7	<input type="checkbox"/>	Programme planning and development (formal capacity)	<input type="checkbox"/>	20
8	<input type="checkbox"/>	Student support and development (formal capacity)	<input type="checkbox"/>	21
9	<input type="checkbox"/>	Other (Please specify) <input type="text"/>	<input type="checkbox"/>	22

**2. Questions regarding undergraduate medical education**2.1 Number of years of involvement (teaching and in any other capacity) with **undergraduate medical education** (not necessarily only at the UFS)

1	<input type="checkbox"/>	0-1		
2	<input type="checkbox"/>	2 to 3		
3	<input type="checkbox"/>	4 to 6		
4	<input type="checkbox"/>	7 to 10		
5	<input type="checkbox"/>	11 to 15		
6	<input type="checkbox"/>	16 to 20		
7	<input type="checkbox"/>	> 20	<input type="checkbox"/>	23

2.2 Are you currently involved in teaching during **semester four** of the UFS M.B.Ch.B. curriculum?

1	<input type="checkbox"/>	Yes		
2	<input type="checkbox"/>	No	<input type="checkbox"/>	24

2.3 Are you currently involved in teaching during **semester five** of the UFS M.B.Ch.B. curriculum?

1	<input type="checkbox"/>	Yes		
2	<input type="checkbox"/>	No	<input type="checkbox"/>	25



### 3. Questions regarding community-based learning

Community-based learning is learning **outside the formal hospital setting** and can occur in a setting such as a municipal or mobile clinic.

3.1 How much **theoretical knowledge** do you have of community-based learning?

1	No knowledge
2	Understand basic definition, with limited knowledge of one context
3	Understand basic definition, with limited knowledge of more than one context
4	Understand basic definition; in-depth knowledge of one or more contexts
5	Other (if applicable)/elaboration of answer

26

3.2 How much **personal experience (regarding time in years)** do you have of community-based learning?

1	None
2	< 1
3	1 to 5
4	> 5
Comments (elaboration of answer)	

27

3.3 How much **personal experience (regarding breadth of experience)** do you have of community-based learning?

1	None
2	One or two contexts
3	Three or more contexts
Comments (elaboration of answer)	

28

**If you have no knowledge and/or experience of community-based learning, we will proceed to section 5 of the questionnaire, that pertains to electrocardiography teaching and learning.**

3.4 What is your general personal attitude/opinion regarding community-based learning in the **preclinical** phase of the UFS undergraduate medical curriculum?

1	Very favourable (positive)
2	Moderately favourable (positive)
3	Neutral (i.e. not positive or negative)
4	Not favourable, to a small degree
5	Not favourable, to a large degree
	Comments/reason for choice of answer

 29

**For each of the following statements, please indicate to which extent you agree or do not agree with the statement.**

3.5 There is sufficient programme time to implement four hours of community-based learning in **semester four**.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
6	I do not have sufficient knowledge of the time available in semester four to answer this question
	<b>Comments/reason for choice of answer</b>

 30

3.6 There is sufficient programme time to implement four hours of community-based learning in **semester five**.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
6	I do not have sufficient knowledge of the time available in semester five to answer this question
	<b>Comments/reason for choice of answer</b>

 31

#### 4. Questions regarding task-based community-based learning

Task-based community-based learning involves a community-based task, such as performance of a cardiovascular risk assessment, the taking of blood pressure or electrocardiography.

For each of the following statements, please indicate to which extent you agree or do not agree with the statement.

4.1 Task-based community-based learning is a valuable form of authentic experiential learning.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 32

4.2 Task-based community-based learning addresses critical cross-field/exit outcomes or competencies such as time management, oral and written communication, ability to work as part of a team and critical problem-solving.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 33

4.3 There are other advantages of task-based community-based learning that do not apply to task-based learning in the skills laboratory.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/elaboration/reason for choice of answer

 34

4.4 Task-based community-based learning is appropriate for the **preclinical phase (i.e. before the end of semester 5)** of the UFS undergraduate medical curriculum.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 35

4.5 The challenges/obstacles/limitations of task-based community-based learning (such as cost implications, available time in the programme, available staff, transport arrangements and ethical issues) can be overcome in the **UFS undergraduate medical curriculum**.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 36

4.6 The advantages of implementing task-based community-based learning in the **preclinical phase** of the UFS medical curriculum outweigh the disadvantages (such as the extra time required, cost and transport arrangements).

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 37

4.7 General personal attitude/opinion regarding task-based community-based learning in the **preclinical phase** of the UFS undergraduate medical curriculum.

1	Very favourable
2	To a certain extent in favour/moderately favourable
3	Neutral (i.e. do not agree and do not disagree)
4	Not favourable, to a small degree
5	Not favourable, to a large degree
	Comments/reason for choice of answer

 38

## 5. Questions regarding electrocardiography learning

5.1 Please indicate your theoretical and practical knowledge of electrocardiography.

1	None
2	Less than the level expected of a "the reasonable" South African general practitioner
3	On the level expected of "the reasonable" South African general practitioner
4	On the level expected of "the reasonable" South African specialist across all disciplines
5	Other (if applicable)

 39

5.2 Please indicate your theoretical and practical knowledge of electrocardiography learning regarding **undergraduate medical curricula**.

1	None
2	Less than the level expected of a "the reasonable" South African general practitioner
3	On the level expected of "the reasonable" South African general practitioner
4	On the level expected of "the reasonable" South African specialist across all disciplines
5	Other (if applicable)

 40

5.3 Please indicate **your number of years of personal experience** in providing electrocardiography training (undergraduate and/or postgraduate medical education).

1	None
2	<1
3	2 to 5
4	6 to 10
5	11 to 20
6	> 20

 41

**If you have no knowledge and/or experience of electrocardiography learning, we will proceed to section 7 of the questionnaire, that pertains to your opinion regarding community-based teaching and learning in general and community-based electrocardiography teaching and learning.**

## 6. Questions regarding contextual aspects of electrocardiography learning

For each of the following statements, please indicate to which extent you agree or do not agree with the statement.

6.1 The basic elements of normal electrocardiography, with a limited number of abnormal electrocardiographic patterns, should be taught in the **preclinical phase of the UFS undergraduate medical curriculum**.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
Comments/reason for choice of answer	

 42

6.2 Electrocardiography in the **preclinical phase** should preferably (if possible) be taught by lecturers who have clinical experience of electrocardiography.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
Comments/reason for choice of answer	

 43

6.3 For **undergraduate medical education**, electrocardiography is appropriate for use as a learning task in the community setting .

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
Comments/reason for choice of answer	

 44

6.4 Most of the electrocardiography-related learning outcomes for the **preclinical phase** can be addressed in the clinical skills unit in combination with simulation training, which renders task-based community-based electrocardiography training unnecessary.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
6	Comments/reason for choice of answer

 45

6.5 The advantages of community-based electrocardiography learning in semesters four and/or five do not justify the **extra costs** that will be incurred due to, for example, transport and tuition materials.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 46

6.6 The advantages of community-based electrocardiography learning in semesters four and/or five do not justify **the extra time and/or staff** that will be required for electrocardiography learning.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 47

6.7 Another task, related to the cardiovascular system, e.g. the taking of blood pressure, will be more suitable to introduce as activity for task-based community-based learning in semesters four and/or five.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 48

6.8 Community-based electrocardiography learning can be implemented in the **preclinical phase** of the UFS undergraduate medical curriculum.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
	Comments/reason for choice of answer

 49

6.9 General personal attitude and opinion regarding community-based electrocardiography learning in the **preclinical phase** of the UFS undergraduate medical curriculum.

1	Very favourable
2	To a certain extent in favour/moderately favourable
3	Neutral (i.e. not positive or negative)
4	Not favourable, to a small degree
5	Not favourable, to a large degree
	Comments/reason for choice of answer

 50

6.10 Community-based electrocardiography learning can be implemented in the **clinical phase** of the UFS undergraduate medical curriculum.

1	Agree, to a large extent
2	Agree, to a (certain) moderate extent
3	Neutral (i.e. do not agree and do not disagree)
4	Do not agree, to a moderate extent
5	Do not agree, to a large extent
6	Comments/reason for choice of answer

 51



**7. General comments regarding the implementation of community-based electrocardiography learning during semesters four and/or five**

Any other comments or recommendations regarding the implementation (feasibility, advantages and challenges) of community-based electrocardiography learning during semesters four and/or five.



**THANK YOU FOR YOUR PARTICIPATION!**

**Vir Afrikaanssprekende respondente:**

“U is volgens sekere insluitingskriteria gekies om deel te neem aan hierdie navorsingsstudie. Ek verklaar hiermee dat alle persoonlike inligting wat deur u gedurende hierdie onderhoud verskaf word met die nodige professionele omsigtigheid en vertroulikheid hanteer sal word en nie met enige derde party, buiten die studieleier (indien nodig) bespreek sal word nie. Daar sal geen melding van deelnemers se name in die navorsingsverslag gemaak word nie. 'n Numeriese koderingstelsel sal gebruik word om die vertroulikheid van u response te verseker. Name of persoonlike identifiseerders sal nie op die datavelle wat vir statistiese analise gestuur word, verskyn nie. Dit sal waardeer word indien u nie u response bespreek met enige derde party gedurende die tydperk waartydens die onderhoude gehou word nie, om 'n ware weerspieëling van Fakulteitslede se persoonlike opinies te verkry en die geldigheid van die navorsingsresultate so hoog as moontlik te probeer hou. Daar is by sekere vrae die geleentheid vir u om kommentaar te lewer of om uit te brei op u antwoord.”

**Voorgraadse gemeenskapsgebaseerde elektrokardiografie onderrig en leer**

Datum van onderhoud: DD/MM/JJJJ

DD	MM	JJJJ
----	----	------

Vir kantoorgebruik

**Instruksies vir respondente van gestruktureerde onderhoud**

Respondent se nommer

--	--

Beantwoord asseblief elke vraag, soos toepaslik, deur u kennis en vorige ervaring van gemeenskapsgebaseerde onderrig en leer en elektrokardiografie onderrig en leer in ag te neem.

1 2

Beantwoord asseblief die vrae so eerlik en volledig as moontlik.

**1. Deelnemer se demografiese inligting**

1.1 Geslag

1  Manlik 2  Vroulik

	3
--	---

1.2 Ouderdom (in jare)

1	21-30
2	31-40
3	41-50
4	51-60
5	> 60

	4
--	---

1.3 Instansie waar deelnemer sy/haar voorgraadse tersiëre opleiding voltooi het

- 1  Universiteit van die Vrystaat
- 2  Universiteit van Pretoria
- 3  Stellenbosch Universiteit
- 4  Kaapstad Universiteit
- 5  Universiteit van die Witwatersrand
- 6  Medunsa
- 7  Kwazulu-Natal Universiteit
- 8  Unitra (Word huidiglik die Walter Sisulu Universiteit genoem)
- 9  Ander (Spesifiseer asseblief)

	5
--	---

1.4 Jaar wat deelnemer sy/haar voorgraadse tersiëre opleiding voltooi het

--	--	--	--	--

6 7 8 9

1.5 Professionele kwalifikasies (Noem asseblief almal)

- 1  M.B.,Ch.B
- 2  Meestergraad (Spesifiseer asseblief)
- 3  Ph.D (Spesifiseer asseblief)
- 4  Ander (Spesifiseer asseblief)

	10
	11
	12
	13

1.6 Huidige beroepsamp/-posisie/-rol/aard van werk (Noem asseblief almal wat van toepassing is)

1	<input type="checkbox"/>	Junior lektor/lektor	<input type="checkbox"/>	14
2	<input type="checkbox"/>	Senior lektor	<input type="checkbox"/>	15
3	<input type="checkbox"/>	Mede-professor	<input type="checkbox"/>	16
4	<input type="checkbox"/>	Professor	<input type="checkbox"/>	17
5	<input type="checkbox"/>	Moduleleier/kursuskoördineerder	<input type="checkbox"/>	18
6	<input type="checkbox"/>	Senior bestuur en administrasie	<input type="checkbox"/>	19
7	<input type="checkbox"/>	Programbeplanning en -ontwikkeling (formele hoedanigheid)	<input type="checkbox"/>	20
8	<input type="checkbox"/>	Studente-ondersteuning en -ontwikkeling (formele hoedanigheid)	<input type="checkbox"/>	21
9	<input type="checkbox"/>	Ander (Spesifiseer asseblief) <input type="text"/>	<input type="checkbox"/>	22

## 2. Vrae ten opsigte van voorgraadse mediese onderrig

2.1 Aantal jare betrokkenheid (onderrig en in enige ander hoedanigheid) t.o.v. voorgraadse mediese onderrig (nie noodwendig net by die UV nie)

1	<input type="checkbox"/>	0-1	<input type="checkbox"/>	23
2	<input type="checkbox"/>	2 tot 3	<input type="checkbox"/>	
3	<input type="checkbox"/>	4 tot 6	<input type="checkbox"/>	
4	<input type="checkbox"/>	7 tot 10	<input type="checkbox"/>	
5	<input type="checkbox"/>	11 tot 15	<input type="checkbox"/>	
6	<input type="checkbox"/>	16 tot 20	<input type="checkbox"/>	
7	<input type="checkbox"/>	> 20	<input type="checkbox"/>	

2.2 Is u huidiglik betrokke by onderrig en leer gedurende semester vier van die UV M.B.Ch.B. kurrikulum?

1	<input type="checkbox"/>	Ja	<input type="checkbox"/>	24
2	<input type="checkbox"/>	Nee	<input type="checkbox"/>	

2.3 Is u huidiglik betrokke by onderrig en leer gedurende semester vyf van die UV M.B.Ch.B. kurrikulum?

1	<input type="checkbox"/>	Ja	<input type="checkbox"/>	25
2	<input type="checkbox"/>	Nee	<input type="checkbox"/>	

### 3. Vrae ten opsigte van gemeenskapsgebaseerde leer

Gemeenskapsgebaseerde leer is leer wat **buite die formele hospitaalkonteks** plaasvind soos bv. in 'n munisipale of 'n mobiele kliniek

3.1 Oor hoeveel **teoretiese kennis** beskik u t.o.v. gemeenskapsgebaseerde leer?

1	Geen kennis nie
2	Verstaan die basiese definisie, met beperkte kennis van een konteks
3	Verstaan die basiese definisie, met beperkte kennis van meer as een konteks
4	Verstaan die basiese definisie, met in-diepte kennis van een of meer kontekste
5	Ander (indien van toepassing)/uitbreiding van antwoord

 26

3.2 Oor hoeveel **persoonlike ervaring** van gemeenskapsgebaseerde leer (**ten opsigte van tyd in jare**) beskik u?

1	Geen
2	< 1
3	1 tot 5
4	> 5
5	Kommentaar (uitbreiding van antwoord)

 27

3.3 Oor hoeveel **persoonlike ervaring** van gemeenskapsgebaseerde leer (**ten opsigte van omvang**) beskik u?

1	Geen
2	Een of twee kontekste
3	Drie of meer kontekste
4	Kommentaar (uitbreiding van antwoord)

 28

Indien u oor geen kennis en/of ervaring beskik ten opsigte van gemeenskapsgebaseerde leer nie, sal ons voortgaan met afdeling 5 van die vraelys, wat handel oor elektrokardiografie onderrig en leer.

3.4 Wat is u algemene persoonlike houding/opinie ten opsigte van gemeenskapsgebaseerde leer in die **prekliniese fase** van die UV voorgraadse mediese kurrikulum?

1	Baie gunstig (positief)
2	Redelik (matig) gunstig (positief)
3	Neutraal (naamlik nòg positief, nòg negatief)
4	Ongunstig, tot 'n klein mate
5	Ongunstig, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 29

**Vir elkeen van die volgende stellings, dui asseblief aan tot watter mate u saamstem, of nie, met die stelling.**

3.5 Daar is voldoende roostertyd om vier ure gemeenskapsgebaseerde leer in **semester vier** te implementeer.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nòg saam en stem nòg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 30

3.6 Daar is voldoende roostertyd om vier ure gemeenskapsgebaseerde leer in **semester vyf** te implementeer.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nòg saam en stem nòg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 31

#### 4. Vrae oor taakgebaseerde gemeenskapsgebaseerde leer

Taakgebaseerde gemeenskapsgebaseerde leer behels 'n gemeenskapsgebaseerde taak, soos die uitvoer van 'n kardiovaskulêre risiko-evaluering, bloeddrukbeplating of elektrokardiografie.

Vir elkeen van die volgende stellings, dui asseblief aan tot watter mate u saamstem, of nie, met die stelling.

4.1 Taakgebaseerde gemeenskapsgebaseerde leer is 'n waardevolle vorm van outentieke (lewensgetroue) ervaringsleer.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 32

4.2 Taakgebaseerde gemeenskapsgebaseerde leer spreek kritiese kruis-veld/uitgangsuitkomstes of kompetensies aan, soos tydbestuur, verbale en geskrewe kommunikasie-vermoë, om as deel van 'n span te werk en kritiese probleemoplossing.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 33

4.3 Daar is ander voordele van taakgebaseerde gemeenskapsgebaseerde leer wat nie van toepassing is op taakgebaseerde leer in die vaardigheidslaboratorium nie.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 34

4.4 Taakgebaseerde leer is toepaslik vir die **prekliniese fase** (naamlik voor die einde van semester 5) van die UV voorgraadse mediese kurrikulum.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 35

4.5 Die uitdagings/struikelblokke/beperkings van taakgebaseerde gemeenskapsgebaseerde leer (soos die koste-implikasies, beskikbare tyd in die program, beskikbare personeel, vervoer-reglings en etiese aspekte) kan oorkom word in the **UV voorgraadse mediese kurrikulum**.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 36

4.6 Die voordele van die implementering van taakgebaseerde gemeenskapsgebaseerde leer in die **prekliniese fase** van die kurrikulum is meer as die nadele (soos die ekstra tyd, kostes en vervoer wat benodig word).

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 37



4.7 Algemene persoonlike houding/opinie ten opsigte van taakgebaseerde gemeenskapsgebaseerde leer in die **prekliniese fase** van die UV voorgraadse mediese kurrikulum.

1	Baie gunstig (positief)
2	Redelik (matig) gunstig (positief)
3	Neutraal (naamlik nòg positief, nòg negatief)
4	Ongunstig, tot 'n klein mate
5	Ongunstig, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 38

### 5.Vrae oor elektrokardiografie-leer

5.1 Dui asseblief u teoretiese en praktiese kennis van elektrokardiografie aan.

1	Geen
2	Minder as die vlak wat verwag word vir "die redelike" Suid-Afrikaanse algemene praktisyen
3	Op die vlak wat verwag word vir "die redelike" Suid-Afrikaanse algemene praktisyen
4	Op die vlak wat verwag word van "die redelike" Suid-Afrikaanse spesialis oor alle dissiplines
5	Ander (indien toepaslik)

 39

5.2 Dui asseblief u teoretiese en praktiese kennis van elektrokardiografie leer ten opsigte van **voorgraadse mediese kurrikula** aan.

1	Geen
2	Minder as die vlak wat verwag word vir "die redelike" Suid-Afrikaanse algemene praktisyen
3	Op die vlak wat verwag word vir "die redelike" Suid-Afrikaanse algemene praktisyen
4	Op die vlak wat verwag word van "die redelike" Suid-Afrikaanse spesialis oor alle dissiplines
5	Ander (indien toepaslik)

 40

5.3 Dui asseblief u **aantal jare van persoonlike ervaring** ten opsigte van die voorsiening van elektrokardiografie-opleiding (voorgraadse en/of nagraadse mediese opleiding).

1	Geen
2	<1
3	2 tot 5
4	6 tot 10
5	11 tot 20
6	>20

 41

**Indien u oor geen kennis en/of ervaring beskik ten opsigte van elektrokardiografie-leer nie, sal ons voortgaan by afdeling 7 van die vraelys, wat handel oor u opinie ten opsigte van gemeenskapsgebaseerde onderrig en leer oor die algemeen en gemeenskapsgebaseerde elektrokardiografie onderrig en leer.**

## 6. Vrae ten opsigte van die kontekstuele aspekte van elektrokardiografie-leer

Vir elkeen van die volgende stellings, dui asseblief aan tot watter mate u saamstem, of nie, met die stelling.

6.1 Die basiese elemente van normale elektrokardiografie met 'n beperkte aantal abnormale elektrokardiografiese patrone, behoort geleer te word in die **prekliniese fase van die UV voorgraadse mediese kurrikulum**.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 42

6.2 Elektrokardiografie in the **prekliniese fase** behoort verkieslik (indien moontlik) aangebied te word deur dosente wat kliniese ervaring het van elektrokardiografie.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 43

6.3 Vir **voorgraadse mediese onderrig**, is elektrokardiografie geskik vir gebruik as onderrigtaak in die gemeenskapskonteks.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 44

6.4 Meeste van die elektrokardiografie-geassosieerde leeruitkomst vir die **prekliniese fase** kan in die kliniese vaardigheidslaboratorium, in kombinasie met simulasië opleiding aangespreek word wat taakgebaseerde, gemeenskapsgebaseerde elektrokardiografie opleiding onnodig maak.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 45

6.5 Die voordele van gemeenskapsgebaseerde elektrokardiografie-leer in semester vier en/of vyf regverdig nie die **ekstra onkoste** wat aangegaan sal moet word as gevolg van, by voorbeeld, vervoer en onderrig-materiale nie.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 46

6.6 Die voordele van gemeenskapsgebaseerde elektrokardiografie-leer in semester vier en/of vyf regverdig nie die **ekstra tyd en/of personeel** wat benodig sal word vir elektrokardiografie-leer nie.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 47

6.7 'n Ander taak, geassosieer met die kardiovaskulêre stelsel, sal meer geskik wees om in te stel as aktiwiteit vir taakgebaseerde gemeenskapsgebaseerde leer in semesters vier en/of vyf.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n (sekere) redelike mate
3	Neutraal (naamlik stem nóg saam en stem nóg nie saam nie)
4	Stem nie saam nie, tot 'n redelike mate
5	Stem nie saam nie, tot 'n groot mate
	Kommentaar/rede vir keuse van antwoord

 48

6.8 Gemeenskapsgebaseerde elektrokardiografie opleiding is prakties uitvoerbaar gedurende die **prekliniese fase** van die UV voorgraadse mediese kurrikulum.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n sekere (matige) mate
3	Neutraal (naamlik gaan nie akkoord met die stelling nie, maar is ook nie daarteen nie )
4	Stem nie saam nie, tot 'n sekere (matige) mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 49

6.9 Algemene persoonlike houding en opinie ten opsigte van gemeenskapsgebaseerde elektrokardiografie opleiding in die **prekliniese fase** van die UV voorgraadse mediese kurrikulum.

1	Baie ten gunste daarvan
2	Tot 'n sekere (matige) mate ten gunste daarvan
3	Neutraal (naamlik gaan nie akkoord daarmee nie, maar is ook nie daarteen nie )
4	Nie ten gunste (positief ingestel) daarvoor nie, tot 'n klein mate
5	Ongunstig, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 50

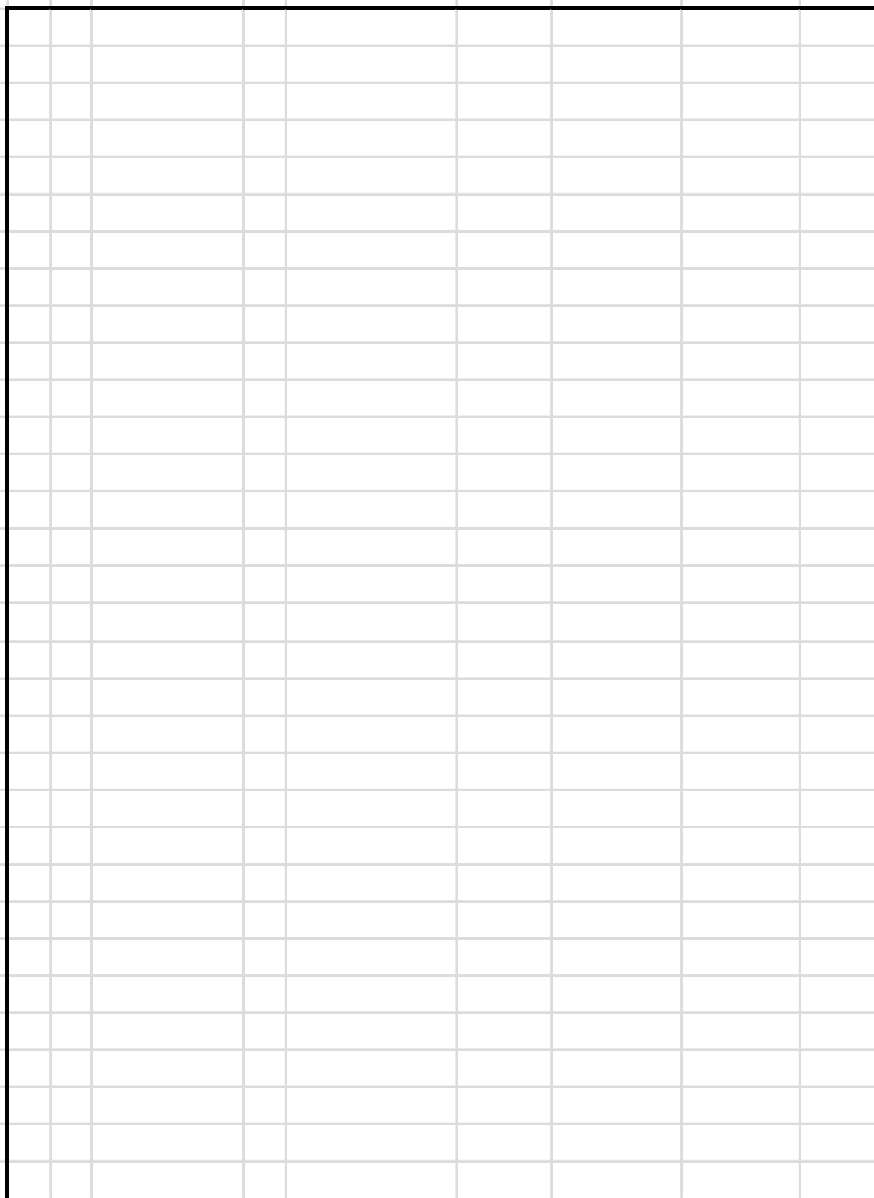
6.10 Gemeenskapsgebaseerde elektrokardiografie opleiding is prakties uitvoerbaar gedurende die **kliniese fase** van die UV voorgraadse mediese kurrikulum.

1	Stem saam, tot 'n groot mate
2	Stem saam, tot 'n sekere (matige) mate
3	Neutraal (naamlik gaan nie akkoord met die stelling nie, maar is ook nie daarteen nie )
4	Stem nie saam nie, tot 'n sekere (matige) mate
5	Stem nie saam nie, tot 'n groot mate
6	Kommentaar/rede vir keuse van antwoord

 51

**7. Algemene opmerkings ten opsigte van die implementering van  
gemeenskapsgebaseerde elektrokardiografie leer gedurende semesters  
vier en/of vyf**

Enige ander kommentaar of voorstelle ten opsigte van die implementering  
(praktiese uitvoerbaarheid, voordele en uitdagings) van gemeenskapsgebaseerde  
elektrokardiografie-leer gedurende semesters vier en/of vyf.



**BAIE DANKIE VIR U DEELNAME!**

**APPENDIX D: Letter of request for approval from the Dean of the UFS  
Faculty of Health Sciences to conduct the research study**

November 2012

Prof GJ van Zyl  
Dean of the Faculty of Health Sciences  
University of the Free State  
Bloemfontein

**Re: Application for permission to perform a research project and collect data from selected Faculty personnel who are involved in the administration and implementation of tuition in the UFS undergraduate medical programme**

Dear Prof van Zyl,

I have registered for a structured Master's degree in Health Professions Education, for which I must conduct a research study related to Health Professions Education. I am currently involved in electrocardiography education during semester four (and the assessment thereof during semester five) of the UFS undergraduate medical curriculum. Taking into account the advantages of community-based learning in undergraduate medical curricula, I would like to investigate the feasibility of introducing community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum.

Task-based community-based learning in the preclinical phase of undergraduate medical curricula has not been widely researched in the global and South African contexts and several challenges (such as the cost implications and availability of staff) will influence the practicability thereof. Consequently, for the purposes of the M.HPE degree, I decided to first perform a survey of the views, opinions and recommendations of Faculty members who are on a position to provide valuable input in this regard. I write this letter to courteously ask for your permission to continue with this research project and to collect the data that are required for this study.

The title of my research project is:

**'COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME'**

My supervisors are:

Dr J Bezuidenhout (Division of Health Sciences Education, Faculty of Health Sciences, UFS)

Dr LJ van der Merwe (Department of Basic Medical Sciences, Faculty of Health Sciences, UFS)

The overall goal of the study is to facilitate the transition between electrocardiography teaching and learning in the preclinical and clinical phases of the curriculum, in alignment with current HPCSA accreditation standards and benchmarks for undergraduate medical education by exploring the possibility of introducing community-based teaching and learning during semesters four and/or five of the undergraduate M.B.,Ch.B. curriculum.

The aim of the study is to investigate the practicability of introducing community-based electrocardiography teaching and learning in semesters four and/or five of the M.B.,Ch.B. programme, as reflected by the views of Faculty members who have the necessary knowledge and experience in this regard.

The objectives of the study (with the research methods that will be used to achieve these objectives) are as follows:

- i. To identify the principal key issues and challenges that will inform decision regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum. **(Literature perspectives)**
- ii. To obtain quantitative and limited, well-defined qualitative information from:
  - a. personnel in the Faculty of Health Sciences who are directly involved in the administration and implementation of the UFS undergraduate medical curriculum (at the time of the study) in a senior capacity

b. lecturers who (at the time of the study) are module leaders and/or session presenters for semesters four and five modules **or** are involved in community-based learning for the undergraduate programme **or** are currently teaching learning content in the preclinical or clinical phases of the undergraduate medical curriculum that is directly related to the cardiovascular system. **(Individual structured interviews)**

The researcher will collect current quantitative and qualitative information regarding the UFS undergraduate curriculum and then conduct individual structured interviews, (which contain closed and open ended questions) with available Faculty personnel who fulfil the inclusion criteria of the study. The quantitative and qualitative information will be correlated and integrated in order to inform further research in this regard. The quantitative research findings will be analysed by the Department of Biostatistics and the qualitative findings will be analysed and interpreted (in correlation with the quantitative findings) by myself, with the guidance of the study leaders.

If the programme-related qualitative information that is collected (e.g. time available in the curriculum) and the data collected from the selected Faculty personnel do not support the practicability of community-based electrocardiography learning, the researcher will explore alternative methods (including the use of simulation) in a future study to facilitate a smooth (seamless) transition regarding electrocardiography learning between the preclinical and clinical phases of the curriculum.

I attach a copy of the protocol and interview schedule that will be used.

I would like to sincerely thank you (in advance) for your attention and consideration of this request.

Yours faithfully,

Dr Carol Olivia Larson  
Magister student in Health Professions Education  
University of the Free State



Student number:1995486105

Room 221, Department of Basic Medical Sciences, Block B, Faculty of Health Sciences, Francois Retief Building, University of the Free State

Telephone number: (051)-4053893 / Cell number: 0844000078

e-mail address: [gnfscol@ufs.ac.za](mailto:gnfscol@ufs.ac.za)

**APPENDIX E: Letter for approval from the Vice-Rector of the UFS  
Academic management to conduct the research study**

November 2012

Prof HR Hay  
Vice-Rector: Academic management  
University of the Free State

**Re: Application for permission to perform a research project and collect data from selected Faculty personnel who are involved in the administration and implementation of tuition in the UFS undergraduate medical programme**

Dear Prof Hay,

I have registered for a structured Master's degree in Health Professions Education, for which I must conduct a research study related to Health Professions Education. I am currently involved in electrocardiography education during semester four (and the assessment thereof during semester five) of the UFS undergraduate medical curriculum. Taking into account the advantages of community-based learning in undergraduate medical curricula, I would like to investigate the feasibility of introducing community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum.

Task-based community-based learning in the preclinical phase of undergraduate medical curricula has not been widely researched in the global and South African contexts and several challenges (such as the cost implications and availability of staff) will influence the practicability thereof. Consequently, for the purposes of the M.HPE degree, I decided to first perform a survey of the views, opinions and recommendations of Faculty members who are on a position to provide valuable input in this regard. I write this letter to courteously ask for your permission to continue with this research project and to collect the data that are required for this study.

The title of my research project is:

**'COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME'**

My supervisors are:

Dr J Bezuidenhout (Division of Health Sciences Education, Faculty of Health Sciences, UFS)

Dr LJ van der Merwe (Department of Basic Medical Sciences, Faculty of Health Sciences, UFS)

The overall goal of the study is to facilitate the transition between electrocardiography teaching and learning in the preclinical and clinical phases of the curriculum, in alignment with current HPCSA accreditation standards and benchmarks for undergraduate medical education by exploring the possibility of introducing community-based teaching and learning during semesters four and/or five of the undergraduate M.B.,Ch.B. curriculum.

The aim of the study is to investigate the practicability of introducing community-based electrocardiography teaching and learning in semesters four and/or five of the M.B.,Ch.B. programme, as reflected by the views of Faculty members who have the necessary knowledge and experience in this regard.

The objectives of the study (with the research methods that will be used to achieve these objectives) are as follows:

- i. To identify the principal key issues and challenges that will inform decisions regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum. **(Literature perspectives)**

- ii. To obtain quantitative and limited, well-defined qualitative information from:
  - a. personnel in the Faculty of Health Sciences who are directly involved in the administration and implementation of the UFS undergraduate medical curriculum (at the time of the study) in a senior capacity
  - b. lecturers who (at the time of the study) are module leaders and/or session presenters for semesters four and five modules **or** are involved in community-based learning for the undergraduate programme **or** are currently teaching

learning content in the preclinical or clinical phases of the undergraduate medical curriculum that is directly related to the cardiovascular system. **(Individual structured interviews)**

The researcher will collect current quantitative and qualitative information regarding the UFS undergraduate curriculum and then conduct individual structured interviews, (which contain closed and open ended questions) with available Faculty personnel who fulfil the inclusion criteria of the study. The quantitative and qualitative information will be correlated and integrated in order to inform further research in this regard. The quantitative research findings will be analysed by the Department of Biostatistics and the qualitative findings will be analysed and interpreted (in correlation with the quantitative findings) by myself, with the guidance of the study leaders.

If the programme-related qualitative information that is collected (e.g. time available in the curriculum) and the data collected from the selected Faculty personnel do not support the practicability of community-based electrocardiography learning, the researcher will explore alternative methods (including the use of simulation) in a future study to facilitate a smooth (seamless) transition regarding electrocardiography learning between the preclinical and clinical phases of the curriculum.

I attach a copy of the protocol and interview schedule that will be used.

I would like to sincerely thank you (in advance) for your attention and consideration of this request.

Yours faithfully,

Dr Carol Olivia Larson

Magister student in Health Professions Education

University of the Free State

Student number:1995486105

Room 221, Department of Basic Medical Sciences, Block B, Faculty of Health Sciences, Francois Retief Building, University of the Free State

Telephone number: 051-4053893 / Cell number: 0844000078

e-mail address: [gnfscol@ufs.ac.za](mailto:gnfscol@ufs.ac.za)

**APPENDIX F: Letter for approval from the Head of the School of Medicine,  
Faculty of Health Sciences, UFS**

November 2012

Prof RA Smego  
Head of the School of Medicine  
Faculty of Health Sciences  
University of the Free State

**Re: Application for permission to perform a research project and collect data from selected Faculty personnel who are involved in the administration and implementation of tuition in the UFS undergraduate medical programme**

Dear Prof Smego,

I have registered for a structured Master's degree in Health Professions Education, for which I must conduct a research study related to Health Professions Education. I am currently involved in electrocardiography education during semester four (and the assessment thereof during semester five) of the UFS undergraduate medical curriculum. Taking into account the advantages of community-based learning in undergraduate medical curricula, I would like to investigate the feasibility of introducing community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum.

Task-based community-based learning in the preclinical phase of undergraduate medical curricula has not been widely researched in the global and South African contexts and several challenges (such as the cost implications and availability of staff) will influence the practicability thereof. Consequently, for the purposes of the M.HPE degree, I decided to first perform a survey of the views, opinions and recommendations of Faculty members who are on a position to provide valuable input in this regard. I write this letter to courteously ask for your permission to continue with this research project and to collect the data that are required for this study.

The title of my research project is:

**'COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME'**

My supervisors are:

Dr J Bezuidenhout (Division of Health Sciences Education, Faculty of Health Sciences, UFS)

Dr LJ van der Merwe (Department of Basic Medical Sciences, Faculty of Health Sciences, UFS)

The overall goal of the study is to facilitate the transition between electrocardiography teaching and learning in the preclinical and clinical phases of the curriculum, in alignment with current HPCSA accreditation standards and benchmarks for undergraduate medical education by exploring the possibility of introducing community-based teaching and learning during semesters four and/or five of the undergraduate M.B.,Ch.B. curriculum.

The aim of the study is to investigate the practicability of introducing community-based electrocardiography teaching and learning in semesters four and/or five of the M.B.,Ch.B. programme, as reflected by the views of Faculty members who have the necessary knowledge and experience in this regard.

The objectives of the study (with the research methods that will be used to achieve these objectives) are as follows:

- i. To identify the principal key issues and challenges that will inform decisions regarding the feasibility of introducing community-based tasks in the preclinical phase of a South African undergraduate M.B.,Ch.B. curriculum. **(Literature perspectives)**
- ii. To obtain quantitative and limited, well-defined qualitative information from:
  - a. personnel in the Faculty of Health Sciences who are directly involved in the administration and implementation of the UFS undergraduate medical curriculum (at the time of the study) in a senior capacity

b. lecturers who (at the time of the study) are module leaders and/or session presenters for semesters four and five modules **or** are involved in community-based learning for the undergraduate programme **or** are currently teaching learning content in the preclinical or clinical phases of the undergraduate medical curriculum that is directly related to the cardiovascular system. **(Individual structured interviews)**

The researcher will collect current quantitative and qualitative information regarding the UFS undergraduate curriculum and then conduct individual structured interviews, (which contain closed and open ended questions) with available Faculty personnel who fulfil the inclusion criteria of the study. The quantitative and qualitative information will be correlated and integrated in order to inform further research in this regard. The quantitative research findings will be analysed by the Department of Biostatistics and the qualitative findings will be analysed and interpreted (in correlation with the quantitative findings) by myself, with the guidance of the study leaders.

If the programme-related qualitative information that is collected (e.g. time available in the curriculum) and the data collected from the selected Faculty personnel do not support the practicability of community-based electrocardiography learning, the researcher will explore alternative methods (including the use of simulation) in a future study to facilitate a smooth (seamless) transition regarding electrocardiography learning between the preclinical and clinical phases of the curriculum.

I attach a copy of the protocol and interview schedule that will be used.

I would like to sincerely thank you (in advance) for your attention and consideration of this request.

Yours faithfully,

Dr Carol Olivia Larson  
Magister student in Health Professions Education  
University of the Free State



Student number:1995486105

Room 221, Department of Basic Medical Sciences, Block B, Faculty of Health Sciences, Francois Retief Building, University of the Free State

Telephone number: 051-4053893 / Cell number: 0844000078

e-mail address: [gnfscol@ufs.ac.za](mailto:gnfscol@ufs.ac.za)

**APPENDIX G: Letter for approval from the Head of the Department of Biostatistics of the Faculty of Health Sciences at the University of the Free State**

November 2012

Prof. G. Joubert  
Department of Biostatistics  
University of the Free State

Dear Prof. G. Joubert,

**Request to evaluate and approve research protocol**

I have registered for a structured Master's degree in Health Professions Education, for which I must conduct a research study related to Health Professions Education. I am currently involved in electrocardiography education during semester four (and the assessment thereof during semester five) of the UFS undergraduate medical curriculum. Taking into account the advantages of community-based learning in undergraduate medical curricula, I would like to investigate the feasibility of introducing community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum.

The title of my research project is:

**'COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME**

My supervisors are:

Dr J Bezuidenhout (Division of Health Sciences Education Development, Faculty of Health Sciences, UFS)

Dr LJ van der Merwe (Department of Basic Medical Sciences, Faculty of Health Sciences, UFS)

I would appreciate it if you could evaluate and approve my research protocol. I would like to convey my sincere thanks to you for your attention and assistance thus far in this regard.

Yours faithfully,

Dr Carol Olivia Larson

Magister student in Health Professions Education

University of the Free State

Student number:1995486105

Block B, Room 221, Department of Basic Medical Sciences,

Faculty of Health Sciences, Francois Retief Building,

University of the Free State

Telephone number: 051-4053893 / Cell number: 0844000078

e-mail address: [gnfscol@ufs.ac.za](mailto:gnfscol@ufs.ac.za)

**APPENDIX H: Letter for approval from the Ethics Committee, School of Medicine, Faculty of Health Sciences, UFS**

November 2012

Mrs H Strauss  
The Chairperson: Ethics Committee  
Block D, Room 115  
François Retief Building  
School of Medicine  
Faculty of Health Sciences  
University of the Free State

**Re: Application for ethical approval to conduct research**

Dear Mrs Strauss,

I have registered for a structured Master's degree in Health Professions Education, for which I must conduct a research study related to Health Professions Education. Taking into account the advantages of community-based learning in undergraduate medical curricula, I would like to investigate the feasibility of introducing community-based electrocardiography learning during semesters four and/or five of the UFS undergraduate medical curriculum.

Title of the research project:

**'COMMUNITY-BASED ELECTROCARDIOGRAPHY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME'**

My supervisors are:

Dr J Bezuidenhout (Division of Health Sciences Education Development, Faculty of Health Sciences, UFS)

Dr LJ van der Merwe (Department of Basic Medical Sciences, Faculty of Health Sciences, UFS)

I hereby apply for ethical evaluation and approval of my research protocol. The statistical analysis will be performed with the assistance of the Department of Biostatistics of the Faculty of Health Sciences at the University of the Free State.

The following documents accompany my letter:

- a. Application form for ethical approval to conduct research
- b. Protocol summary
- c. Curriculum vitae
- d. Research protocol (which includes proposed study budget)
- e. Data information sheet for potential participants
- f. Informed consent form for participants of the study
- g. Preliminary schedule for structured interviews (in Afrikaans and English)
- h. Letter of approval from the Dean of the Faculty of Health Sciences
- i. Letter of approval from the Vice Rector: Academic management, UFS
- j. Letter of approval from the Department of Biostatistics, UFS

My sincere thanks for your attention and consideration of this request.

Yours faithfully,

Dr Carol Olivia Larson

Magister student in Health Professions Education

Student number:1995486105

Block B, Room 221, Department of Basic Medical Sciences,

Faculty of Health Sciences, Francois Retief Building,

University of the Free State

Telephone number: 051-4053893 / Cell number: 0844000078

e-mail address: [gnfscol@ufs.ac.za](mailto:gnfscol@ufs.ac.za)

## APPENDIX I: Profile of interviewees according to selection criteria

DESIGNATION	INTERVIEW NUMBER	PERMANENT UFS FOHS MEMBER FOR MIN. OF 5 YEARS	SEM 4 OR 5 MODULE LEADER OR LECTURE R AT TIME OF STUDY	PRECLINICAL PHASE: SENIOR MANAGEMENT/ QUALITY ASSURANCE/ PROGRAMME PLANNING/ ADMINISTRATION	INVOLVED IN COMMUNITY-BASED TEACHING AND LEARNING IN UNDERGRAD. M.B.Ch.B CURRICULUM	EXPERIENCE IN UNDERGRAD. ECG TRAINING	EXPERIENCE IN POSTGRAD. ECG TRAINING
Senior lecturer	1	X	X				
Junior lecturer	2	X	X				
Senior lecturer	3	X	X				
Head of Dept.; senior specialist	4	X		X	X	X	X
Head of Dept.; senior lecturer	5	X	X	X			
Senior specialist; senior lecturer	6	X			X		
Head of Dept.; senior specialist	7	X		X	X		
Senior specialist; senior lecturer	8	X	X			X	X
Senior administrator	9	X		X			
Senior specialist	10	X	X	X	X	X	X
Education specialist	11	X		X			
Senior specialist	12	X	X	X	X	X	X
Senior lecturer	13	X	X	X		X	
Senior lecturer	14	X	X			X	
Senior specialist; senior lecturer	15	X			X	X	X

Head of Dept.; senior specialist; senior lecturer	16	X	X	X			
Senior lecturer	17	X	X				
Junior lecturer	18	X	X				
Senior lecturer	19	X	X				
Head of Dept.; senior specialist	20	X	X	X		X	
Senior specialist	21	X		X			
Senior specialist	22	X	X			X	
Senior administrator	23	X		X			
Junior lecturer	24	X			X		
Head of Dept.; senior specialist; senior lecturer	25	X	X	X			
Senior specialist; senior lecturer	26	X			X		
Head of Dept.; senior specialist	27	X		X			
Head of Dept.; senior specialist	28	X		X		X	X
Senior specialist; senior lecturer	29	X			X	X	
Senior specialist; senior lecturer	30				X	X	X
Senior specialist; senior lecturer	31	X		X	X	X	X
Senior specialist; senior lecturer	32	X		X	X	X	X

Head of Dept.; senior specialist; senior lecturer	33	X		X	X		
Senior specialist; senior lecturer	34	X		X	X		



## APPENDIX J: The 2013 UFS PHASE 2 programme structure

PHASE II							
YEAR 2							
Semester 2		Semester 3 (152C)		Semester 4 (88C)		Semester 5 (104C)	
<b>GMR124 (0C) **</b> Membranes, receptors and principles of pharmacotherapy <i>Dr. C.O. Larson      Dr. P. van Zyl</i>		<b>GMR218 (32C)</b>		<b>GUS264 (16C)</b> Urinary system <i>Prof. A. Crous</i>		<b>MFV354 (16C)</b> Respiratory system <i>Dr. H.J. Geyer</i>	
<b>MEO124 (0C) **</b> Structure and development of the body (dissection programme) <i>Dr. C. Vorster</i>		<b>MEO218 (32C)</b>		<b>MEQ264 (16C)</b> Haematology and Immunology <i>Dr. A.D. Jafta</i>		<b>MEX354 (16C)</b> Health and disease in populations <i>Dr. B. de Klerk</i>	
<b>MEI124 (0C) **</b> Molecules of the body and metabolism <i>Dr. H.C. de Villiers</i>		<b>MEI218 (32C)</b>		<b>MIS264 (16C)</b> Cardiovascular system <i>Mnr. G.J. van Zyl</i>		<b>MGB354 (16C)</b> Nervous system <i>Dr. S. van Zyl</i>	
		<b>MFP214 (16C)</b> Mechanisms of disease <i>Prof. B.D. Middlecote</i>		<b>MEY264 (16C)</b> Genital system <i>Dr. A.M. Gerber</i>		<b>GEE354 (16C)</b> Endocrine system <i>Dr. L. de Bruyn</i>	
		<b>MJR214 (16C)</b> Infections and Antimicrobial drugs <i>Dr. D. Goedhals</i>		<b>MEU264 (16C)</b> Gastro-intestinal system <i>Dr. H.J. Geyer</i>		<b>MEZ354 (16C)</b> Human diversity, human rights and legal ethics <i>Dr. L. Fouché</i>	
<b>GSM124 (0C) **</b> Epidemiology, biostatistics and special study module (SSM) <i>Prof. W.J. Steinberg &amp; Prof. G. Joubert</i>		<b>GSM213 (12C)</b>		<b>GSM262 (0C)</b> Epidemiology, biostatistics and special study module <i>Prof. G. Joubert &amp; Prof. W.J. Steinberg</i>		<b>GSM352 (8C)</b>	
Development Programme (LDP) of 6 months for candidates that failed				<b>GKV264 (0C) **</b> Clinical skills [and Emergency Care] <i>Dr. L. de Bruyn &amp; Prof. W.J. Steinberg</i>		<b>GKV353 (12C)</b>	
IMA190 Integrated Medical Assessment Module Mark				IMA290 Integrated Medical Assessment Module Mark			

\*\* Continuation

**APPENDIX K: Gender-related distribution of session presenters for Phase 2 modules in 2013 (excluding the presenters of the Learning Development Programme)** (Sources: UFS Phase II phase guide 2013-2014, Dr D Goedhals and Ms C Swart at the School of Medicine). Certain personnel were session-presenters for more than one module (as indicated by the brackets after their names appear for the first time)

<b>Module code</b>	<b>Gender</b>	
<b>Semester (s)</b>	<b>Male</b>	<b>Female</b>
<b>Semesters 2, 3, 4 and 5</b>		
<b>GSM124, GSM213, GSM262 and GSM352</b>	<b>Prof H Steinberg</b>	<b>Prof G Joubert</b>
<b>Semesters 2 and 3</b>		
<b>GMR124 and 218</b>	<b>Prof A Walubo</b>	<b>Dr CO Larson Dr R Smith Dr PM van Zyl</b>
<b>MEO124 and MEO218</b>	<b>Dr Jacobus H Potgieter Mr GJ van Zyl</b>	<b>Dr C Vorster Mrs A Nel Dr Y Coetzee Miss J Correia Miss N Peter</b>
<b>MEI124 and MEI218</b>		<b>Dr HC de Villiers</b>
<b>Semester 3</b>		
<b>MFP214</b>	<b>Prof BD Middelcote Dr BD Henderson</b>	<b>Dr J van der Merwe Dr J Goedhals Prof CA Beukes</b>
<b>MJR214</b>	<b>Mr L Mathengtheng, Prof AA Hoosen (Prof Walubo) Dr J-L Pretorius</b>	<b>Dr D Goedhals Dr T Wojno Dr M Pieters Mrs A van der Spoel van Dijk (Dr PM van Zyl) (Dr R Smith) Dr S Potgieter</b>
<b>Semester 4 and 5</b>		
<b>GKV264 and GKV353</b>		
<b>Semester 4 and 5</b>		
	<b>Internal Medicine: Dr S Schoeman Dr H Coetzer  Family Medicine:</b>	<b>Skills laboratory Dr J Lombaard Dr L de Bruyn</b>

	<b>Dr WJ Rabie</b>	
<b>Semester 4</b>	<p><b>Urology:</b>  <b>Dr H Horn</b>  <b>Dr J Myburg</b>  <b>Dr Pietersen</b></p> <p><b>Orthopaedics:</b>  <b>Dr A Aranda</b>  <b>Dr J du Toit</b>  <b>Dr C Blake</b>  <b>Dr F Fourie</b>  <b>Dr J van Reenen</b>  <b>Dr K Marais</b>  <b>Dr G Conradie</b>  <b>Dr D Taute</b>  <b>Dr J Arndt</b>  <b>Dr J Bithrey</b></p> <p><b>Family Medicine:</b>  <b>Dr TH Kellerman</b></p> <p><b>Haematology:</b>  <b>Dr W Janse van Rensburg</b>  <b>Dr J Roodt</b></p> <p><b>Physiology:</b>  <b>Dr AM Gerber</b></p>	<p><b>Physiology:</b>  <b>(Dr CO Larson)</b></p>
<b>Semester 5</b>	<p><b>Otorhinolaryngology:</b>  <b>Dr J Claassen</b>  <b>Dr J Tiedt</b>  <b>Dr I Butler</b></p> <p><b>Anaesthesiology:</b>  <b>Dr TD Boleke</b>  <b>Dr LJ van der Nest</b>  <b>Dr J-H Potgieter</b>  <b>Dr P de Wet</b></p> <p><b>Surgery:</b>  <b>Dr P Oosthuizen</b>  <b>Dr V Simmons</b>  <b>Dr NE Pearce</b>  <b>Dr DP Menge</b>  <b>Dr RG Botha</b>  <b>Dr CT Snowdowne</b></p> <p><b>Neurology:</b>  <b>Dr A van Aswegen</b></p>	<p><b>Paediatrics</b>  <b>Dr E Pretorius</b>  <b>Dr E Daffue</b>  <b>Dr Z Mukhahiwa</b>  <b>Dr M Conradie</b></p> <p><b>Otorhinolaryngology:</b>  <b>Dr T Erasmus</b>  <b>Dr T Daniller</b></p> <p><b>Anaesthesiology:</b>  <b>Dr M Reyneke</b>  <b>Dr A Kuhn</b>  <b>Dr L le Roux</b>  <b>Dr MJ Lemmer</b></p> <p><b>Surgery:</b>  <b>Sr D Smith</b>  <b>Sr P van der Merwe</b></p> <p><b>Neurology:</b></p>

	<b>Dr Ackerman</b>	<b>Dr L Smit</b> <b>(Dr E Pretorius)</b> <b>Dr Nicol</b> <b>Dr E van Rensburg</b>
<b>Semester 4</b>		
<b>GUS264</b>	<b>Prof A Crous</b> <b>Dr HJ Geyer</b> <b>Prof JM KuyI</b>	<b>(Prof CA Beukes)</b> <b>(Dr D Goedhals)</b> <b>Dr R Smith</b> <b>(Dr C Vorster)</b>
<b>MEQ264</b>	<b>(Dr AM Gerber)</b> <b>Prof V Louw</b> <b>Prof MJ Coetzee</b> <b>Prof C Viljoen</b>	<b>Dr AD Jafta</b> <b>Dr L Pretorius</b>
<b>MIS264</b>	<b>(Mr GJ van Zyl)</b> <b>(Prof A Walubo)</b>	<b>(Dr C Vorster)</b> <b>(Dr CO Larson)</b> <b>(Prof CA Beukes)</b> <b>(Dr D Goedhals)</b> <b>(Dr PM van Zyl)</b>
<b>MEY264</b>	<b>(Mr GJ van Zyl)</b> <b>(Dr AM Gerber)</b> <b>(Prof BD Middelcote)</b>	<b>(Dr C Vorster)</b> <b>(Dr PM van Zyl)</b> <b>(Dr D Goedhals)</b>
<b>MEU264</b>	<b>(Dr HJ Geyer)</b>	<b>(Dr HC de Villiers)</b> <b>(Dr D Goedhals)</b> <b>(Dr PM van Zyl)</b> <b>(Dr J Goedhals)</b>
<b>Semester 5</b>		
<b>MFW354</b>	<b>(Dr HJ Geyer)</b>	<b>(Dr C Vorster)</b> <b>Dr S Smith</b> <b>(Dr R Smith)</b> <b>(Dr D Goedhals)</b> <b>(Prof CA Beukes)</b>
<b>MEX354</b>	<b>(Prof WJ Steinberg)</b> <b>Prof WH Kruger</b> <b>Prof A Venter</b> <b>Dr P Pienaar</b> <b>Dr S Maduna</b> <b>Dr M Seitshiro</b> <b>Dr L Mosotho</b> <b>Dr T Seshoka</b> <b>Dr LM van der Merwe</b> <b>Dr W Esterhuizen</b>	<b>Dr L Fouche</b> <b>Dr A de la Quirra</b> <b>Dr M Strydom</b> <b>Dr H Mngomezulu</b>
<b>MGB354</b>	<b>(Prof A Walubo)</b> <b>(Prof JM KuyI)</b> <b>(Prof BD Middlecot)e</b> <b>Prof AJ Kruger</b>	<b>Dr S van Zyl</b> <b>(Mrs A Nel)</b> <b>(Dr PM van Zyl)</b> <b>(Dr D Goedhals)</b>

		(Dr L Smit) (Dr E van Rensburg)
GEE354	(Dr AM Gerber) (Mr GJ van Zyl)	(Dr L de Bruyn) (Dr R Smith) Dr M Koning Dr C Esterhuyzen
MEZ354	(Dr BD Henderson) (Dr Jacobus H Potgieter) Prof H Oosthuizen (Dr TH Kellerman) Dr C Boltman (Dr WJ Rabie) Dr J van Rooyen	Prof H Brits Dr M Marais Dr C Liebenberg (Dr L Fouché)
<b>Total gender-specific numbers</b>	<b>63 (57%)</b>	<b>48 (43%)</b>
<b>Total</b>	<b>111</b>	

**APPENDIX L: Statistical data, reflecting the diversity of interviewees' characteristics, with the percentages**

<b>Percentage</b>	<b>Characteristic</b>
<b>56</b>	Completed undergraduate tertiary training at UFS,
<b>97</b>	Completed undergraduate tertiary training ten or more years previously.
<b>79</b>	Master's degree (of which 3 were a Master's degree in Health Professions Education)
<b>29</b>	Ph.D. (of which 3 were a Ph.D. in Health Professions Education).
<b>71</b>	Module leader or course coordinator
<b>88</b>	Senior lecturer or professor
<b>71</b>	More than 10 years' involvement in undergraduate medical training
<b>47</b>	Involved in semester four and five teaching and learning
<b>27</b>	In-depth knowledge of one or more CBL contexts
<b>65</b>	At least one year of CBL-related experience
<b>47</b>	Has worked in three or more different CBL environments
<b>21</b>	Has in-depth knowledge of one or more contexts, with more than 5 years' CBL experience and experience of a minimum of three different CBL contexts.
<b>35</b>	Has theoretical and practical knowledge of electrocardiography on the level of "the reasonable South African general practitioner"
<b>32</b>	Has theoretical and practical knowledge of electrocardiography knowledge on the level of "the reasonable South African specialist across all disciplines".
<b>41</b>	With regard to undergraduate ECG learning, has knowledge on the level of "the reasonable South African general practitioner"
<b>24</b>	With regard to undergraduate ECG learning has knowledge on the level of "the reasonable South African specialist across all disciplines".
<b>65</b>	Has personal experience in providing undergraduate and/or postgraduate electrocardiography training.
<b>4</b>	Has more than 20 years' experience of providing ECG training and has proficiency in electrocardiography and ECG learning on a specialist level.

**APPENDIX M: Approval: the Ethics Committee, Vice-Rector: Academic,  
Head of the School of Medicine, Dean of the Faculty of Health Sciences,  
and language editors**



Research Division  
Internal Post Box G40  
☎ (051) 4052812  
Fax (051) 4444359

E-mail address: StraussHS@ufs.ac.za

Ms H Strauss/hv

2012-11-28

REC Reference nr 230408-011  
IRB nr 00006240

DR CO LARSON  
DEPT OF BASIC MEDICAL SCIENCES  
FACULTY OF HEALTH SCIENCES  
UFS

Dear Dr Larson

ECUFS NR 218/2012

DR CO LARSON

DEPT OF BASIC MEDICAL SCIENCES

PROJECT TITLE: COMMUNITY-BASED ELETROCARDIOGRAPHY TEACHING AND LEARNING  
IN SEMESTERS FOUR AND FIVE OF THE UFS M.B. CH.B. PROGRAMME.

- You are hereby kindly informed that the Ethics Committee approved the above project at the meeting held on 27 November 2012.
- Committee guidance documents: Declaration of Helsinki, ICH, GCP and MRC Guidelines on Bio Medical Research. Clinical Trial Guidelines 2000 Department of Health RSA; Ethics in Health Research: Principles Structure and Processes Department of Health RSA 2004; Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa, Second Edition (2006); the Constitution of the Ethics Committee of the Faculty of Health Sciences and the Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines.
- Any amendment, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.
- The Committee must be informed of any serious adverse event and/or termination of the study.
- A progress report should be submitted within one year of approval of long term studies and a final report at completion of both short term and long term studies.
- Kindly refer to the ETOVS/ECUFS reference number in correspondence to the Ethics Committee secretariat.

Yours faithfully

  
.....  
DR SM LE GRANGE  
ACTING CHAIR: ETHICS COMMITTEE

Cc Dr J Bezuidenhout

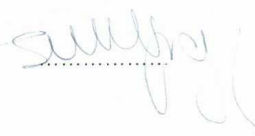
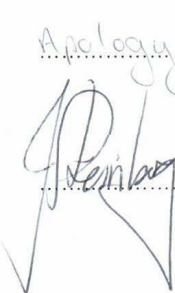
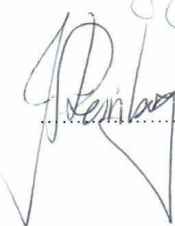


**ETHICS COMMITTEE  
OF THE FACULTY OF HEALTH SCIENCES**

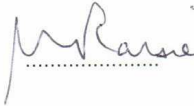

**ATTENDANCE LIST OF THE MEETING HELD ON 27 NOVEMBER 2012**

**A. FACULTY MEMBERS**

**1. SCHOOL OF MEDICINE REPRESENTATIVES**

Prof WH Kruger	Dept of Community Health (Chairperson) M.B. Ch.B (UFS) M.Med. (Community Health) (UFS) MBA (PU for CHE) Ph.D (Community Health) (UFS)	Apology
Prof DK Stones	Dept of Paediatrics and Child Health M.B. Ch.B (UCT) M.Med Paediatrics (UFS)	Apology
Dr SM le Grange (Lady)	Dept of Surgery (Acting chair) M.B. Ch.B (UFS) M.Med. (Surgery) (UFS) Cert. Paediatric Surgery (College of Surgeons of SA)	
Prof PJ Pretorius	Dept of Psychiatry M.B. Ch.B (UFS) M.Med (Psychiatry)	Apology
Prof BJS Diedericks	Dept of Anaesthesiology FFA (SA) M.Med (Anaesthesiology) (UFS) BA (Philosophy) UNISA M.B. Ch.B (UFS)	
Prof WJ Steinberg	Dept of Family Medicine M.B. Ch.B; DPH; DTM & H (Wits) M.Fam.Med (UFS) Dip. Obst (SA), FCFP	



Prof PH Wessels	Dept of Obstetrics and Gynaecology M.B. Ch.B; M. Med. (O. et G.) (UFS) L.K.O.G. (SA) MD (UFS)	Apology
Prof BW J van Rensburg	Dept of Internal Medicine M.B. Ch.B (UP) M. Med (Internal Medicine) (UP) FCP (SA)	Apology
Dr WJ Rabie	Dept of Family Medicine M.B. Ch.B (UFS) M.Fam.Med. (UFS) ATLS, Trauma Society ATLS instructor, Trauma Society	
Ms M Nel (Lady)	Dept of Biostatistics B.A. (Urbanology) B.A. Hons. (Statistics) M.Med.Sc (Biostatistics) (UFS) IRENSA Diploma in International Research Ethics 2006	

**2. SCHOOL OF NURSING REPRESENTATIVES**

Ms RM Mpeli (Lady)	School of Nursing Diploma in General Nursing Diploma in Midwifery Advance University Diploma in Clinical Nursing (Advanced Midwifery and Neonatology) B.Soc.Sc. (Nursing Education) M.Soc.Sc (Nursing)	Apology
Dr DE Botha (Lady)	School of Nursing M. Soc.Sc (Nursing) (UFS) Ph.D (Nursing) (UFS)	Apology

**3. SCHOOL OF ALLIED HEALTH PROFESSIONS REPRESENTATIVES**

Prof CM Walsh (Lady)	Dept of Human Nutrition B.Sc Dietetics (UFS) M.Sc Dietetics (UFS) Ph.D (Dietetics) (UFS)	
-------------------------	---	---

Ms PA Hough  
(Lady)

Dept of Occupational Therapy  
B.Sc Occupational Therapy (UFS)  
M.Sc Occupational Therapy (UFS)

*PA*  
Apology

Ms R Smith  
(Lady)

Dept of Physiotherapy  
B.Sc (Physiotherapy) (UFS)

*R Smith*

**4. BIOSTATISTICIAN**

Prof G Joubert  
(Lady)

Dept Biostatistics  
B.A. UCT, B.Sc. UCT  
B.Sc (Hons) (Mathematical Statistics) UCT  
M.Sc. (Mathematical Statistics) UCT

*G Joubert*

**B. NON-SCIENTIFIC MEMBERS**

**1. RELIGIOUS/LAY MEMBER**

Religious member has to be appointed.

**2. LEGAL MEMBER**

Prof H Oosthuizen

Dept Criminal Law  
B.Iur., LL.B., LL.D. (UFS)

Apology

Prof R-M Jansen  
(Secundus) (Lady)

Dept Private Law  
B.Soc.Sc. (Nursing) Hons.  
B.Iur., LL.B., LL.M. (UFS)

*R M Jansen*

**C. INDEPENDANT MEMBERS NOT AFFILIATED WITH INSTITUTION**

**1. LAY MEMBERS**

Ms KM Jingosi  
(Lady)

Child and Family Welfare Society  
Social Auxiliary Work  
SA Council for Social  
Service Professions

*KM Jingosi*

Ms SS Seclave  
(Secundus) (Lady)

Retired  
Primary Lower Teacher's Certificate  
Teacher's Higher Bilingual Certificate  
Education Diploma for the Junior  
Primary Phase (UFS)

Apology

Ms EF Makowa  
(Secundus) (Lady)

Admin Clerk  
Drakensberg Logistics  
Bloemfontein

*Ekowe*



Prof WMJ  
v d Heever Kriek  
(Lady)

Ph.D Clinical Technology  
School of Health Technology  
Central University of Technology,  
Free State  
Bloemfontein

*halla*



Dr NRJ van Zyl

Clinical Head: Universitas Hospital  
Bloemfontein  
M.Med. (UFS)  
Business MBL (UNISA)

Apology

Dr BM Masitha  
(Lady)

H.O.C.S. - Chief Medical officer  
Free State Psychiatric Complex  
Bloemfontein  
M.B. Ch.B.  
B.Sc Hons Health Sciences IFE - Nigeria  
B.Sc NBLs - ROMA

.....

Dr BA Benganga

Head: Clinical Services  
Pelonomi Hospital  
Bloemfontein



Ms BJ Ramodula

Chief Executive Officer  
National District Hospital  
Bloemfontein

.....

hp LaserJet 3030

ETHICS COM UFS  
051 4444359  
2012-Nov-29 14:25



Fax Call Report

Job	Date	Time	Type	Identification	Duration	Pages	Result
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29-NOV-2002 13:14 From:0514019140

Page:1/1



VERKLARING VIR NIE-BYWONING VAN  
ETIEKKOMITEE VERGADERING /  
DECLARATION OF NON-ATTENDANCE OF A ETHICS  
COMMITTEE MEETING

Hiermee word u versoek om te bevestig dat u die inhoud van die Agenda van die Etiekkomitee vergadering van 27 NOVEMBER 2012 kondoneer. /  
You are hereby kindly requested to confirm that the contents of the Agenda of the Ethics Committee meeting on 27 NOVEMBER 2012 has been condoned.

Ek,

Delene Ellen Botha

verklaar hiermee dat ek die inhoud van genoemde dokument kondoneer. /

I,

hereby declare that I condone the contents of the mentioned document.

GETEKEN te Blaauwfontein

hierdie 29 dag van November 2012

SIGNED at .....

this 29 day of November 2012

Delene Ellen Botha

HANDTEKENING / SIGNATURE



VERKLARING VIR NIE-BYWONING VAN  
ETIEKKOMITEE VERGADERING /  
DECLARATION OF NON-ATTENDANCE OF A ETHICS  
COMMITTEE MEETING

Hiermee word u versoek om te bevestig dat u die inhoud van die Agenda van die Etiekkomitee vergadering van 27 NOVEMBER 2012 kondoneer. /

*You are hereby kindly requested to confirm that die contents of the Agenda of the Ethics Committee meeting on 27 NOVEMBER 2012 has been condoned.*

Ek,

.....  
verklaar hiermee dat ek die inhoud van genoemde dokument kondoneer. /

I, Molieni Rosemary Mpei

hereby declare that I condone the contents of the mentioned document.

GETEKEN te .....

hierdie ..... dag van ..... 20... /

SIGNED at Bloemfontein on

this 27 day of November 2012

Mpei

HANDTEKENING / SIGNATURE



Siekkeloo  
2/8/2012

UNIVERSITY OF THE  
FREE STATE  
UNIVERSITEIT VAN DIE  
VRYSTAAT  
YUNIVESITHI YA  
FREISTATA



UFS·UV  
HEALTH SCIENCES  
GESONDHEIDSWETENSAPPE

E0423n  
Fakulteit Gesondheidswetenskappe  
Universiteit van die Vrystaat  
2012-11-14  
Dean: Faculty of Health Sciences  
University of the Free State

**APPROVAL FORM: UFS AUTHORITIES /  
GOEDKEURINGSVORM: UV OWERHEDE**

FOR PARTICIPATION OF STUDENTS/STAFF OF THIS FACULTY IN RESEARCH  
PROJECTS  
VIR DEELNAME VAN STUDENTE/PERSONEEL VAN HIERDIE FAKULTEIT AAN  
NAVORSINGSPROJEKTE

Name & student/ staff number  
Naam & studente-/personeelnr DR C.O. LARSON [Staff no: 0101766  
Stud. no: 1995486105]  
Department  
Departement Basic Medical Sciences  
Tel nr & e-mail  
Tel nr & e-pos (W) 051-4053893 / Cell: 0844000078 [e-mail:  
Study leader(s) DR J Bezuidenhout → 051-4053095 [gntsc@ufs.ac.za  
Studieleier(s) DR L. VAN DER MERWE → 051-4053107

Title of project / Titel van projek  
Community-based electrocardiography teaching and learning in  
Semesters four and five of the UFS M.B.Ch.B  
programme

Who will be involved in the study? Please tick (✓) in appropriate box. /  
Wie sal by die studie betrek word? Merk (✓) asseblief in die gepaste blokkie.

	YES / JA	NO / NEE
Personnel Personeel	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Students Studente	<input type="checkbox"/>	<input checked="" type="checkbox"/>

X Please attach the protocol for the study and the Ethics Committee application form.


Kindly note that it is the responsibility of the researcher(s) to ensure that all relevant signatures are obtained before this signed form is returned to the Ethics Committee Administration Division (D115) Francois Retief Building, Faculty of Health Sciences, UFS. The protocol may, however, be submitted for Ethics Committee approval while signatures are being obtained. /

Heg asseblief die protokol vir die studie hierby aan, asook die Etiekkomitee aansoekvorm.

Neem asb kennis dat dit die verantwoordelikheid van die navorser(s) is om te verseker dat alle toepaslike handtekeninge verkry word voor hierdie getekende vorm terugbesorg word aan die Etiekkomitee Administratiewe kantoor (D115) Francois Retief-gebou, Fakulteit Gesondheidswetenskappe, UV. Die protokol mag intussen ingehandig word vir Etiekkomitee goedkeuring terwyl handtekeninge bekom word.

A.

Approved /  
Goedgekeur  Rejected /  
Afgekeur  
HEAD OF SCHOOL /  
HOOF VAN DIE SKOOL

 14-11-12  
SIGNATURE / HANDTEKENING DATE / DATUM

COMMENTS / KOMMENTAAR:

B.


Approved /  
Goedgekeur  Rejected /  
Afgekeur  
DEAN OF THE FACULTY /  
DEKAAN VAN DIE FAKULTEIT

 15/11/12  
SIGNATURE / HANDTEKENING DATE / DATUM

COMMENTS / KOMMENTAAR:

C.

Approved /  
Goedgekeur  Rejected /  
Afgekeur  
VICE-RECTOR: ACADEMIC  
VICE-REKTOR: AKADEMIES  
PROF. HR HAY  
VICE-RECTOR: ACADEMIC  
TEL: 051-4013773

 20/11/2012  
SIGNATURE / HANDTEKENING DATE / DATUM

COMMENTS / KOMMENTAAR:

D.

If research will include students on campus and if questionnaires will be distributed in hostels on campus the Dean: Student Affairs has to be notified. /  
Wanneer studente op kampus by navorsing ingesluit gaan word en wanneer vraelyste versprei gaan word by koshuise moet die Dekaan: Studente Aangeleenthede in kennis gestel word.



29 January 2014

---

To: Dr C.O. Larson  
Room 315, Block B  
Francois Retief Building  
Basic Medical Sciences  
Faculty of Health Sciences  
University of the Free State  
Bloemfontein

PO Box 339 (G25)  
Bloemfontein  
9300

13 Conde Street  
Bayswater  
Bloemfontein  
9301

29/01/2014

**Statement by language editor**

I hereby declare that I language edited a dissertation by Dr C.O. Larson titled 'COMMUNITY-BASED ELECTROCARDIOGRAPY TEACHING AND LEARNING IN SEMESTERS FOUR AND FIVE OF THE UFS M.B.,Ch.B. PROGRAMME'. The text was edited for language matters and consistency and not for compliance with any other style requirements. Should there be any enquiries in this regard I can be contacted as below:

Mobile phone: 0832652654

E-mail address: jennylake@fastmail.fm



Yours faithfully,

Jennifer Lake

27 January 2014

*Luna Bergh*

55 Jim Fouché Avenue  
Universitas, Bloemfontein

To whom it may concern

This is to certify that I language-edited Chapters 1 and 2 of Carol Larson's dissertation manually. She effected the changes herself. In this way both linguistic excellence and the candidate's ownership of her text were ensured.

Sincerely



Luna Bergh

Language and writing specialist

29 January 2014

Ms M de Klerk  
237 President Paul Kruger Street  
Universitas  
Bloemfontein  
9301

To whom it may concern

This is to certify that I language-edited the references of Chapters 1, 2 and 3 of Carol Larson's dissertation manually. She effected the subsequent changes herself. In this way the quality of the language used and the candidate's ownership of the text were ensured.

Sincerely



Ms M de Klerk

Language and writing specialist

## APPENDIX N: Afrikaans quotations for Chapter 5

**TABLE 5.1: COMMUNITY-BASED LEARNING (CBL)**

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)
Theoretical knowledge	Definition of CBL (location and trainee)	CBL DEF	<p>12: "gemeenskapsgebaseerde leer kan ook in die huis voorkom, op die sportveld..... dit hoef nie net gebonde te wees tot gesondheidsfasiliteite nie" "community-based learning can also occur in the home, on the sports field... it does not have to be associated with health facilities"</p> <p>14: "die definisie van wat mense sê is gemeenskapsgebaseerde leer verskil..... is Kimberley Hospitaal deel daarvan?" "die definisie..... dit is 'n groot kaveaat....."</p> <p>"the definition of what people say is CBL is differs..... is Kimberley part of it?" "...the definition... it is a big caveat...."</p> <p>18: "Ek het met verpleegpersoneel ook gemeenskapsgebaseerde leer toegepas"</p> <p>"I also applied CBL with nursing personnel"</p> <p>20: "onderrig gegee aan pasiënte, sowel as verpleegkundiges en die mediese personeel....." "taught patients, as well as nurses and the medical personnel..."</p> <p>21: "uitreike.....veral siftingsondersoeke"</p> <p>"outreaches..... especially screening tests" "outreaches... especially screening tests"</p>
Number of years' experience	Contextual learning	CONT LNG	<p>14: "watse probleme presenteer pasiënte mee op die primêre gemeenskapsarea-vlak"</p> <p>"with which problems patients present on the primary community area level"</p> <p>17: "gee vir die studente 'n baie goeie insig van wat voorlê" "gives the students a very good insight into what lies ahead"</p> <p>26: "...see patients in the environment... some of the patients I visited in their home" "to see what type of patients are attending the clinic: their social circumstances.... environmental and what they sort of think about the clinic... their background: .... their socio-economic..."</p> <p>27: "kan van die begin af sien waarnatoe hulle op pad is" "can see from the beginning what lies ahead"</p> <p>31: "hulle oriënteer..... holistiese benadering..... milieu van die pasiënte" "orientate them... holistic approach... milieu of the patients"</p> <p>33: "also being involved with the health care workers... have to do the home visits to see the environment and social determinants of health, in that specific environment"</p>

Breadth of experience	Community health centres (where respondents worked)	COMM HC	<p>4: "Omega dienssentrum vir bejaardes" "Omega centre for the elderly"</p> <p>29: "Gabriel Dichabe kliniek, en.....Sunflower House..... Gateway kliniek by Nasionaal" "Gabriel Dichabe clinic, and ...Sunflower House... Gateway clinic at National"</p> <p>30: Heidedal en in Batho en in die ouetehuse..... uitreik ding gehad na Lesotho toe: Leribe Hospitaal" "Heidedal and in Batho and in the old age homes ....had an outreach thing to Lesotho: Leribe Hospital"</p> <p>31: Heidedal kliniek..... Sunflower House..... het ek vir die Vrystaatse Vereniging vir die versorging van gestremde..... mense het ek uitgery na 'n kliniek toe..... 'n versorgingshuis in Mangaung" "Heidedal clinic...Sunflower House... I drove out to a clinic ... a care home in Mangaung for the Free State Society for the care of disabled... persons"</p> <p>33: "old age homes.... social organisations, such as the churches ... and government institutions"</p>	
General personal attitude/opinion of respondents	Prerequisites for implementation	PRE	Appropriate learning outcomes (Sub-category A)	<p>4: "moet die uitkomst baie goed definieer..... bepaalde taak toegeken met die instruksies vooraf... belyn met sy akademiese onderbou" "must define the outcomes very well... specific assigned task with prior instructions... aligned with his academic foundational knowledge"</p> <p>11. "integrasie met die spesifieke kurrikulum en die omvang van die kurrikulum" "integration with the specific curriculum and the extent of the curriculum"</p> <p>21: "hulle kliniese ervaring is dalk nie so baie dat hulle te veel moet doen op daardie stadium nie" "in plaas van byvoorbeeld formele onderrig in Universiteitsopset of hospitaalopset, kan 'n mens dieselfde onderrig in 'n kliniek gaan doen..... dieselfde uitkomst" "their clinical experience is perhaps not so much that they must do too much at that stage" "instead of, for example, providing tuition in a University context or hospital context, one can provide the same tuition in a clinic...the same outcomes"</p> <p>30: "moet beperk tot wat die ouens kan verstaan op daardie stadium" "must limit to what the guys can understand at that stage"</p>
			Effective time management (Sub-category B)	<p>3. "gaan oor tydsbesteding.... studente het genoeg tyd as hulle dit reg bestuur" "has to do with use of time.... students have enough time if they manage it correctly"</p> <p>16: "Dit sal in groepe moet wees....." "It will have to be in groups..."</p> <p>21: dit wat jy reeds doen..... in die gemeenskap doen" "that which you already do... do in the community"</p> <p>26: "matter of seeing the importance... should make time"</p> <p>27: "n mens moet net 'n plan maak..... gaan alles oor prioriteite.... laat eerder lesings val..." "A person must just make a plan... everything has to do with priorities... rather omit lectures..."</p> <p>29: "ek dink tog 'n mens sal... veral as jy dit kombineer met iets anders... dink ek tog sal jy dit kan inpas" "I think a person will... especially if you combine it with something else... I think you will fit it in"</p>

**TABLE 5.2: TASK-BASED COMMUNITY-BASED LEARNING (TB CBL)**

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)
Authentic experiential learning	Student-related advantages	SADV	<p>Exposure to diverse patient groups, tasks, environments and factors (Sub-category A)</p> <p>1: "blootstelling..... sekere etniese groepe.... geloof... nie 'n manlike dokter toelaat om eers 'n EKG op haar te doen nie; ..... wat obees is..... selfone mag lui"                      "exposure... certain ethnic groups... religion... not allow a male doctor to even perform an ECG on her; ... that are obese .... cell phone may ring"                      4: "blootstelling..... studente self EKG's moes neem" "exposure... students had to perform ECG's themselves"                      14: "ander uitkomst wat 'n ou kan bereik, wat jy net in die gemeenskap kan bereik, omdat daar spesifieke pasiënte in konteks is" "other outcomes that one can address, that you just cannot address in the community, because there are specific patients in context"                      15: "meer lewensgetrou as om dit net in 'n klaskameropset vir hulle aan te bied"                      .. "more authentic than just presenting it to them in a classroom context"                      27: "Nadat hy die pasiënt in konteks gesien het: dan gaan doen hy die EKG of hy doen die bloeddruk sodat die taak sin maak in terme van die pasiënt wat hy gesien het" "After he has seen the patient in context: then he goes and does the ECG or he does the blood pressure so that the task makes sense in terms of the patient that he saw"</p>
			<p>Practical application of knowledge (Sub-category B)</p> <p>3: "as 'n ou iets doen dat jy sien wat jy doen, dan verstaan jy dit net beter as wat jy dit net hoor" "if a person does something so that you see what you are doing, then you just understand it better than if you only hear it"                      23: "nie net teoretiese kennis..... jy moet dit kan toepas ook" "not only theoretical knowledge... you must be able to apply it too"</p>
Addresses critical cross-field/exit outcomes or competencies	Student-related advantages	SADV	<p>Increases communication skills (Sub-category A)</p> <p>1: "kommunikasie "skill" wat hulle gaan ontwikkel"                      "communication skill that they are going to develop"                      3: "as jy met die ander ouens kan kommunikeer en saamwerk" "if you can communicate and work together with the other persons"                      14: "die kommunikasie is baie belangrik" "the communication is very important"</p>
			<p>Promotes teamwork and collaborative skills (Sub-category B)</p> <p>3: "saamwerk" "work together"                      9: " 'n groep is altyd beter.... moet mekaar kan reghelp"                      "a group is always better.... must be able to correct each other"                      12: "as hulle in 'n span werk" "if they work together in a team"</p>

<p>Other advantages not applicable to TBL in the skills laboratory</p>	<p>Student-related advantages</p>	<p>SADV</p>	<p>Exposure to authentic situations (Sub-category A)</p>	<p>1: "Daar kan praktiese probleme bykom." "Practical problems can arise."  2: "Die vaardigheidslaboratorium kan nie 'n ten volle outentieke omgewing skep nie..... veranderlike faktore in die gemeenskap wat nie nageboots kan word nie"  "The skills laboratory cannot create a fully authentic environment.... variable factors in the community that cannot be simulated"  4: "ware lewe omgewing.... as ons bv. aan die einde van 'n sessie vir die studente vra:..... soms verrassende positiewe antwoorde" "true life milieu.... if we e.g. at the end of a session ask the students:... sometimes surprisingly positive answers"  7: "daar is goed wat jy in die gemeenskap kan leer wat jy nie in die vaardigheidslaboratorium kan leer nie: baie meer prakties" "there are things that you can learn in the community, that you cannot learn in the skills laboratory: much more practical"  8: "outentisiteit..... die werklike kliniese omgewing het baie voordele....."authenticity.... the real clinical environment has many advantages"  10: "leer hoe met ander mense te werk..... tyd beter te spandeer....om "equipment" wat nie werk nie....." "earn how to work with other people .... manage time better... to... equipment that does not work"  12: "die konteks baie beter verstaan... die konteks in 'n simulasielab" is baie gekontroleerd....." "understand the context much better... the context in a simulation "lab" is very controlled...."  23: "ander siekteprofile as die in die hospitale te leer ken" "get to know other disease profiles than those in the hospitals"  29: "altyd anders om dit in die regte "real life situation" te doen ....onvoorspelbaarheid van pasiënte" "always different to do it in the real life situation... unpredictability of patients"  31: "werklikheidsopleiding..... as ons die studente wil leer om pasiëntgeoriënteerd te wees" "reality training.... if we want to teach the students to be patient-oriented"  32: "blootstelling gee aan pasiënte-kontak" "provide exposure to patient contact"  34: "rural population.... They can really see what the real scene at the grass-root level is"</p>
			<p>Promotes communication skills</p>	<p>14: "kommunikasie-aspekte.... die taalprobleme: om te werk met ....hmm.... tolke...." "communication aspects..... the language problems:to work with ....hmm.... translators"  18: "kommunikasie..... pasiënte wat 'n ander taal....."  "communication.... patients that (speak) another language"  20: "anderste om met 'n model te werk as om met 'n mens te werk. Dit gaan oor</p>

				kommunikasie en houding....." "different to work with a model than to work with a person. It has to do with communication and attitude..."
	Community-related advantages	CADV	More cost-effective	31: "Meer bekostigbaar in terme van die pasiënt" "More cost-effective in terms of the patient"
			Greater accessibility has a positive effect	31: "baie positief as hulle sien dat daar uitgereik word na hulle toe.... beter of makliker toegang" "very positive if they see that they are receiving attention.... better or easier access"
Is appropriate for the preclinical phase of the UFS curriculum	Exposure	EXP	Positive aspects (Sub-category A)	1: "hoe gouer jy hulle daaraan gaan blootstel, hoe gouer gaan hulle uit die aard van die saak daai taak op 'n vlak kan doen wat jy graag wil hê....." "the sooner you expose them to it, the sooner in fact they will be able to do that task on a level that you would like..." 21: "baie goed om hulle bloot te stel aan daardie omgewing" "very good to expose them to that environment" 3. "dat hulle meer kan klem lê op die kliniese goed wat hulle daarna gaan doen..... as 'n mens dit vir hulle kan inskerp voor die tyd..." "that they can place more emphasis on the clinical things that they are going to do later... if you can emphasise it for them before the time..." 6: "versterk die teorie....dat hulle dit ook beter verstaan" "consolidates the theory.... that they understand it better too" 23: "Taakgebaseerde leer kan jy eintlik basies al vanaf semester 1 doen: dit word wêreldwyd so gedoen" "You can do task-based learning from semester 1: it is done worldwide like that" 27: "hoe meer hulle kan doen, hoe meer gemotiveerd is hulle "the more they can do, the more motivated they are" 28: "Dit is waarskynlik die beste tyd" "It is probably the best time" 26: "We have got several senses... you are touching flesh and blood... you are communicating verbally with somebody; you are visually seeing somebody; you are touching a living person"
			Negative aspects (Sub-category B)	2: "het dalk nie genoeg kennis en ervaring in die veld om die veranderlike omgewing van die gemeenskap te kan hanteer nie: hulle moet meer stabiele, gestruktureerde gevalle hê" "perhaps do not have enough knowledge and experience to be able to handle the changeable environment of the community: they should have more stable, structured cases" 8: "met beperkte kliniese ervaring ..... weet ek nie van hoeveel waarde dit gaan wees in die prekliniese fase nie" "with limited clinical experience I do not know of how much value it will be in the



			<p>preclinical phase"</p> <p>15: "studente kan dalk nie verstaan wat is die kliniese relevansie daarvan nie" "students may not understand what the clinical relevance is thereof"</p> <p>17: "...is ek net nie heeltemal seker of die... .of hulle al regtig heeltemal gereed is altyd vir... vir daardie tipe taakgebaseerde leer nie" "... I am not entirely sure .... whether they are already really completely ready always for that type of task-based learning"</p> <p>21: "dalk nog net nie klinies so vaardig....." perhaps not so clinically adept...."</p>
		Prerequisites for implementation (Sub-category C)	<p>4: "nie probeer om alles wat in die kliniese jare gaan kom vir hulle daar blootstelling te gee nie" "not try to provide exposure to everything that will follow in the clinical years"</p> <p>15: "moet baie spesifiek gemaak word en miskien in konteks verduidelik word.....om toepaslik te wees" "must be made very specific and perhaps explained in context.... to be appropriate"</p> <p>20: "nie enige taak..... Dit sal spesifieke dinge wees" "not any task.... It will be specific things"</p>
The UFS challenges can be overcome	Challenges that raised concern	CHA	<p>3: "...finansiële implikasies is daar maar altyd oral....." "there are always financial implications everywhere"</p> <p>12: "min administratiewe en politiese wil" "little administrative and political will"</p> <p>12: "moet die Universiteit hulle vervoer....., versekering..." "must the University transport them... insurance..."</p> <p>"eties en geregte...geregte denke..." "ethically and legally...legal disposition"</p> <p>13: "eties... vervoer ... dit gaan veral oor die finansies..." "ethically.... transport...it especially has to do with the finances"</p> <p>17: "vervoer en kostes..... Al die studente het nie motors nie....." "transport and costs... All the students do not have cars"</p> <p>18: 'hidden' struikelblokke..... studente wat gaan siek wees of hulle mis dit om een of ander rede... wat is die implikasie as 'n student dit dan gemis het?" " hidden obstacles... students that are going to be sick or they miss it for some or other reason" ".....vervoer....." "...transport..."</p> <p>19: "Dit hang van die Universiteit af en die Provinsie. Etiese goed is nie in ons hande nie" " Dit is taai..... met ons beperkte bronne....." "It depends on the University and the Province. Ethical things are not in our hands"</p> <p>20: "It is tough... with our limited resources...."</p> <p>21: ".....koste-implikasies....." "...cost implications..."</p> <p>22: "do not have the place...I do not think there are enough personnel (with the workload).</p> <p>24: "cost implications"</p> <p>25: "beskikbare tyd" "available time"</p> <p>30: "...is daar rênge vervoer vir klein groepies heen en weer? .....hulle kan nie baie wees nie, want 'n kliniek kan nie baie hanteer nie....." "... is there really transport for small groups to and fro? .... they cannot be many,</p>

			<p>because a clinic cannot accommodate many....."</p> <p>30: ". is daar genoeg geld?..... hierdie bussies van ons kos duisende rande"  "...is there enough money?... these mini-buses of ours cost thousands of rands" "dan het die een bus gaan staan: dan .... die hele klas hang.....Sodra jy mense moet rondry, is jy van buitefaktore afhanklik..... die 'driver' is siek..... almal het nie hulle eie vervoer nie"  "then the one bus broke down: then the whole class waits.....when you must transport people, you are dependent on external factors.... The driver is sick.... everyone does not have their own transport"  31: "beskikbare tyd in die program" "available time in the programme" ""koste-implikasies....."  cost implications" "from experience often have problems to obtain state transport or University transport....."  "etiese aspekte..... almal wat betrokke is..... voordat 'n student 'n pasiënt ondersoek, moet hy die pasiënt inlig..... ingeligte toestemming" "ethical aspects... everyone involved.... before a student examines a patient, he must inform the patient ... informed consent" ""heelwat poste wat nie noodwendig gevul is nie...."several posts that are not necessarily filled....."</p> <p>32: "vervoerkostes" "transport costs" "etiese aspekte..... net fisiese ondersoeke" "ethical aspects.... only physical examinations....."</p> <p>34: "time-wise .... resource-wise ..."</p>
	Possible solutions	PS	<p>7. "kan met die nodige beleide aangespreek word" "can be addressed with the necessary policies"  14: "as die nodige politieke wil daar is in die skool" "if the necessary political will is there in the school"  "... met verwysing na personeel en beskikbare tyd, waar 'n mens kleiner groepe laat roteer"  ".....with reference to personnel and available time, where you let smaller groups rotate"  18: "moet 'n logboek invul....." "must complete a log book" "...baie mooi moet beplan word..... reëls en regulasies sal voor die tyd beplan moet word....."  must be planned very well..... rules and regulations must be planned in advance"  21: "nearer places..... not have to go away for weeks.... can stay in their homes or in the hostel.... approximately an hour's drive from Bloemfontein"  23: "Ons moet net die wil kry.....as 'n mens die ding beplan" "We must just get the will... if you plan the thing"  27: "...plan carefully and people must buy into the process"  30: "...as die politieke geld "power" agter is.... as jy genoeg geld op 'n probleem gooi..."  ".....mooi beplan en mense moet inkoop by die proses" ".....if the political money power is behind it...if you throw enough money on a problem...."  31: "beplanning van die kurrikulum....." "planning of the curriculum...." "In Bloemfontein, spesifiek, is ons kontakpunte.....ons klinieke daarbuite, nie so ver....."  In Bloemfontein, specifically, our contact points.... Our clinics outside, not so far..." "tog busvervoer vir die studente....kan organiseer en wat die dosent dan kan insluit..." "have bus transport for the students.. can organise and which can include the lecturer..." "alle poste beskikbaar gaan moet oopgestel word en genoeg personeel aangestel moet word..." "all available posts will have to be made available and enough personnel employed..."</p>

The advantages exceed the dis-advantages in the preclinical phase	Exposure	EXP	<p>1: "...gaan oor blootstelling..." "...has to do with exposure..."</p> <p>14: "gaan hulle beter voorberei vir die werkplek..." "will prepare them better for the work place..."</p> <p>23: "ons roem daarop: ons leer ons studente in konteks, maar ons doen dit nie werklik nie"</p> <p>"we profess: we teach our students in context, but we do not really do it"</p> <p>29: "meer voordelig om met regte pasiënte te werk as om in 'n laboratorium te sit..... interpersoonlike vaardighede aan te leer.....daaraan blootgestel word" "more advantageous to work with real patients than to sit in a laboratory... to learn interpersonal skills.... .to be exposed to that"</p>
	Prerequisites for support of this statement	PRE	<p>11: "moet geïntegreer word ..... vir die uitkomst per module en ook vir die programuitkomst"</p> <p>"must be integrated... for the outcomes per module and also for the programme outcomes"</p> <p>12: "hang af van die taak self: of dit toepaslik is" "depends on the task itself: how appropriate it is"</p>
	Reasons for not supporting this statement	RNS	<p>2: "is alternatiewe wat beter opsies bied.....vaardighedslaboratoriums"</p> <p>"are alternatives that provide better options.... skills laboratories"</p> <p>8: "daar is sekere dinge wat 'n mens 'on site' kan doen in 'n vaardighedslaboratorium....."</p> <p>"there are certain things that a person can do 'on site' in a skills laboratory...."</p> <p>15: ".ek sou graag meer inligting wil hê....." ".I would like more information...."</p> <p>18: "hidden' struikelblokke" "hidden obstacles" "Ongelukkig gaan 'n mens eers, wanneer so 'n program hardloop, kan agterkom maar wat is die nadele?" Unfortunately one will only, when such a programme runs, find out (but) what are the disadvantages?"</p> <p>20: "as jy tyd wegvat iewers, betaal jy 'n prys"</p> <p>if you omit time somewhere, you pay a price"</p> <p>28: "...ek kan nie sê hoe weeg dit op teenoor die ander goed wat julle daar moet doen nie"</p> <p>"I cannot say how it weighs up against the other things that you do there"</p> <p>30: "Jy weet nie hoeveel geld dit gaan kos nie"</p> <p>"You do not know how much money it will cost"</p>
TB CBL in the UFS preclinical phase: respondents' general personal attitudes/ opinions	Prerequisites for success	PRES	<p>3: ".....student(e) so oriënteer dat hulle die belang daarvan besef....."</p> <p>"orientate the student(s) in such a way that they realise the importance thereof"</p> <p>13 ".....moenie te veel tyd wegvat van die gewone opleiding..... Dit moenie oorheers nie....."</p> <p>"... must not take away too much time from the normal teaching.... It must not be dominant...."</p> <p>30: ".....baie ouens weet nie waar MUCPP is nie, was nog nooit in Batho of Freeletsong nie..... Waar gaan die student staan? Waar gaan die student sit? Wie gaan hom hanteer? Gaan jy ekstra personeel moet aanstel.....?"</p> <p>"..... many people do not know where MUCPP is, have never been in Batho or Freeletsong... Where will the student stand? Where will the student sit? Who is going to manage him? Are you going to employ extra personnel?"</p> <p>31: ".....as dit 'n kliniese opdrag is.....bv. gaan neem die bloeddruk van ..... van tien persone.....dan dink ek kan dit baie goed werk" "if it is a clinical assignment.... e.g. go and measure the blood pressure of... of ten persons....then I think it can work very well"</p>

**TABLE 5.3: CONTEXTUAL ASPECTS OF ELECTROCARDIOGRAPHY LEARNING**

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)
ECG elements that should be taught in the preclinical phase	Required foundational knowledge	RFK	<p>31: "gekoördineer met die anatomie en die elektrofisiologie van die hart" "co-ordinated with the anatomy and the electrophysiology of the heart"</p> <p>32: "kardiovaskulêr.....geskiedenis en basiese ondersoekmetodes gedoen het op daardie stadium....." "cardiovascular... have done history and basic examination methods at that stage...".</p>
	Specific content recommended	SCR	<p>3: ".....die nut daarvan insien" "understand the value thereof"</p> <p>14: "hoe om dit prakties te neem en tegnies te 'check' dat die kalibrasie en die spoed en goed reg is..... basiese komponente.....die as te kan uitwerk, die ritme te kan uitwerk.... dat dit anatomies 'gelink' is met die hart.... vanaf 'n miokardiale isgemie tot 'n infarksie en terugkeer..... atriale fibrillasie..... in die kliniese jare kan verder gegaan word na hartblokke toe, na bondeltakblokke toe, na fladders toe..... saam met die hantering." "Die volgende stappie op..... basiese elektrolietstoornisse soos hiperkalemie en hipokalemie....." "how to record it practically and check it technically that the calibration and the speed etc. are correct... basic components....to be able to determine the axis, the rhythm.... that it is anatomically linked to the heart.... from a myocardial ischaemia to an infarction and recovery ... atrial fibrillation... in the clinical years you can proceed to conduction blocks, to bundle branch blocks, to flutters... together with the management" "The next little step up... basic electrolyte disturbances such as hyperkalaemia and hipokalaemia...."</p> <p>15: "miokard-infarksie.....basiese disritmieë..... soos bv. atrium-fibrillasie" "myocardial infarction.... basic arrhythmias.... e.g. atrial fibrillation"</p> <p>17: "infarction"</p> <p>18: "normale elektrokardiografie met die beperkte abnormaliteite moet definitief so vroeg as moontlik begin word." "normal electrocardiography with the limited abnormalities must definitely be started as early as possible"</p> <p>21: "a ventricular fibrillation or an atrial fibrillation"</p> <p>22: "bradikardie of 'n tagikardie, ekstrasistole..... atriale afwykings soos 'n fladder..... 'n atriale fibrillasie" "bradycardia or a tachycardia, extrasystoles... atrial abnormalities such as a flutter.... an atrial fibrillation"</p> <p>27: "atriale fibrillasie, ventrikulêre tagikardie, ventrikulêre fibrillasie en ek dink 'n atriale fladder..... basiese hartblokke: 'n derde graadse hartblok..... bondeltakblokke.....'n akute miokardiale infarksie..... 'n bradikardie en 'n tagikardie....." "atrial fibrillation, ventricular tachycardia, ventricular fibrillation and I think an atrial flutter...basic conduction blocks: a third degree conduction block ...bundle branch blocks... an acute myocardial infarction.... a bradycardia and a tachycardia..."</p> <p>28: "ST segment elevasie infarksie.....'n regter as en 'n linker as, 'n bondeltakblokpatroon...." "Atriumfibrillasie".... ekstrasistole"</p>

		<p>"ST segment elevation infarction.....a right axis and a left axis, a bundle branch block pattern...." "Atrium fibrillation... extrasystoles..."</p> <p>29: "lebensbedreigende goed... soos ventrikulêre tagikardieë en fibrillasie.... Die algemeenste goed.... soos atriale fibrillasie en dan ook soos miokardiale infarsie" "life-threatening things.... such as ventricular tachycardias and fibrillation.... The most common things.... such as atrial fibrillation and then also like myocardial infarction"</p> <p>30: "spoed en ritme en infarsie.... fibrillasie.....hipertrofie... 'n STEMI patroon..... blokke." "speed and rhythm and infarction.... fibrillation..... hypertrophy... a STEMI pattern..... blocks."</p> <p>31: ".....eers kyk na die stadige disritmes: die hartblokke is geweldig belangrik." "Die vinnige disritmes: atriale fibrillasie..... ventrikulêre fibrillasie en ventrikulêre tagikardie wat pasiënte doodmaak" "....first look at the slow arrhythmias: the conduction blocks are extremely important." "The fast arrhythmias: atrial fibrillation... ventricular fibrillation and ventricular tachycardia that kills patients"</p> <p>32: ".....ventrikulêre ekstrasistole....ventrikulere tagi- en ventrikulêre fibrillasie.....al die isgemiese beelde....die STs en al daardie goed....." "....ventricular extrasystoles.... ventricular tachy- and ventricular fibrillation... all the ischaemic images.... the STs and all those things... "</p> <p>33: Tachy-arrhythmias... and also bradycardias.... myocardial infarction....</p> <p>34: "ischaemic changes, ventricular fibrillation.... cardiac arrest... ventricle tachycardia..., asystole.... pulseless electrical activity..... the four different types of cardiac arrest"</p>
	<p>General participant suggestions</p>	<p>1: "belangrik om wel vir mense bietjie abnormaliteite t.o.v EKG te leer..... 'n basiese afleiding kan maak" "important to teach people a few abnormalities.... be able to draw a basic conclusion"</p> <p>10: "nie te veel abnormale goeters nie..... die normale goeters moet baie beter vasgelê te word as enigiets anders" "not too many abnormal things... the normal things must be consolidated much better than anything else"</p> <p>14: ".dat ons hulle so basies leer dat almal sterk is in daardie goeters.....so die 'content' verminder....." "....that we teach them so basically that everyone is strong in those things...so decrease the content..."</p> <p>23: "....jy leer die normale. Die abnormale kan jy 'n bietjie van gee....." "....you teach the normal. The abnormal you can give a little of...."</p> <p>26: "they need to get used to the normal..."</p> <p>27: "....nie geïsoleerd staan in die prekliniese fase nie" ".... not stand isolated in the preclinical phase"</p> <p>28: "....iets gebeur tussen waar julle hulle leer en hier waar hulle in die vyfde jaar kom..... hulle het alles vergeet teen die tyd wat hulle hier kom..... Die gewone EKG: hulle weet nie hoe om hom te benader nie....." ".....sodra jy kom by spesifieke diagnoses dink ek nie hulle kan dit kontekstueel sit, as hulle nog nie eers weet wat is 'n infark nie, hoekom verander hy en hoe verander hy....." "nie spesifiek diagnose-gekopplede goed soos akute infarsie, ASD....."</p> <p>"... something happens between when you teach them and here where they reach the fifth year... they have forgotten everything by the time they get here... The ordinary ECG: they do not know how to approach it..."</p> <p>"... as soon as you come to specific diagnoses I do not think they can place it contextually, if they do not even know what an infarct is, why it changes and how it changes..."</p> <p>"not specific diagnosis-linked things such as acute infarction, ASD..."</p>

			<p>29: "nie te veel, te vinnig..." "not too much, too fast..."</p> <p>31: "...ek neem aan dit word gekoördineer met die anatomie en die elektrofisiologie van die hart" "...die normale moet jy eers baie goed verstaan. En dan die abnormale is waarskynlik die algemene abnormaliteite.....soos bv. miokardiale infarksie en disritmieë...."</p> <p>"...I assume it is coordinated with the anatomy and electrophysiology of the heart"</p> <p>"...you must first understand the normal very well. And then the abnormal is probably the general abnormalities... such as e.g. myocardial infarction and arrhythmias...."</p> <p>32: "Dit hang nou net af presies wat hulle al geleer het: kardiovaskulêr.....geskiedenis en basiese ondersoekmetodes..... hartblokke kan hulle later leer" "It depends what exactly they have already learnt: cardiovascularly.... history and basic examination methods.... they can learn conduction blocks later"</p>
<p>ECG in the preclinical phase should preferably be taught by lecturers with clinical ECG experience</p>	<p>Clinician as lecturer: advantages</p>	<p>CLA</p>	<p>3: ".....kan studente baie duidelik met hulle ervaring daar help, as hulle iets vra....."</p> <p>"... can help students very clearly with their experience there, if they ask something... "</p> <p>4: ".....sal baie moeilik wees vir iemand wat nie die kliniese ervaring het om die kliniese beeld en die EKG beeld bymekaar uit te bring en ook dan by die beplanning van die verdere hantering van die pasiënt nie...."</p> <p>"... will be very difficult for someone who does not have the clinical experience to connect the clinical presentation and the ECG registration and also then with the further management of the patient...."</p> <p>8: ".....weet wat die studente moet leer.....wat is van toepassing op die kliniese omgewing....." "... know what the students must learn... what is applicable to the clinical environment"</p> <p>13: "n klinikus het n bietjie meer praktiese ervaring met pasiënte.... mense met probleme"</p> <p>"a clinician has a little more practical experience with patients.... people with problems"</p> <p>18: "n gevallestudie daaraan te heg en dit kan uit jou eie kliniese ervaring maklik na vore kom en vir die student meer outentiek en meer verstaanbaar maak; hoekom dit van belang is wat hy nou moet leer" "to attach a case study to it and it can easily clarify it from your own clinical experience and make it more authentic for the student: why it is important what he must learn now"</p> <p>20: "In die kliniek is dit so bietjie kliniese interessantheid wat hy byvoeg....." "In the clinic it is a little clinical, interesting content that he adds"</p> <p>21: "Ek dink hulle is die beste toegerus....." "I think they are the best equipped... "</p> <p>22: ".....wanneer jy begin met afwykings..... goed dat n persoon, wat in die kliniese wêreld verkeer, daarvan praat"</p> <p>"... when you start with abnormalities... good that a person, who is in the clinical world, talks about it"</p> <p>23: "Anders kan jy nie die teorie lekker by die prakties uitbring nie....." "Otherwise you cannot link the theory nicely to the practical"</p> <p>27: "in die konteks kan gee van n kliniese geval waarop hy sou kon uitbrei..... hoef nie noodwendig n kliniese dokter te wees nie: dit kan.... hh.....bv. n paramedikus wees".</p> <p>"can give in the context of a clinical case on which he can expand ... does not necessarily have to be a clinical doctor: it can.... hh..... be a paramedic, for example".</p> <p>30: "..... hy moet kliniese ervaring hê" "... he must have clinical experience"</p> <p>31: "want anders kan jy nie die konteks vir die student oordra nie..... jy kan dit verifieer met jou kliniese</p>

			kontak....." "otherwise you cannot convey the context to the student... you can verify it with your clinical contact..."
Reasons why a non-clinician will suffice	RNS		<p>7: "...hulle gaan tog die.... hhhh.... praktiese ervaring daarvan in hulle kliniese jare kry"</p> <p>"...they are going to... hhh.... anyway get the practical experience of that in their clinical years"</p> <p>15: "baie keer is dit moeilik vir .....klinici om ....grootliks betrokke te raak by die prekliniese jare" "often it is difficult for clinicians to ..... become involved, to a large extent, in the preclinical years"</p> <p>20: "fisioloë wat verstaan wat aangaan kan ook baie goeie onderrig (gee).....want dit is patroon-herkenning, dit is fisiologie verstaan"</p> <p>"physiologists that understand what is going on can also provide very good tuition.... because it is pattern recognition, it is an understanding of Physiology"</p> <p>22: "In die basiese beginsels.....ja, dit kan deur die fisiologie gedek word"</p> <p>"In the basic principles...yes, it can be covered by the Physiology"</p>
General participant suggestions	GPS2		<p>8: "...amper eenvoudiger aangebied kan word..... dalk sal dit help met die retensie"</p> <p>"....can almost be presented in a simpler way... perhaps it will help with retention"</p> <p>14: " 'teaching' vaardighede van die persoon..... meer belangrik as die kliniese agtergrond"</p> <p>"teaching skills of the person.... more important than the clinical background"</p> <p>15: "sou daar 'n program saamgestel word of daar 'n kurrikulum ontwikkel word, moet iemand wat wel kliniese ervaring het van elektrokardiografie betrokke wees..... in 'n raadgevende hoedanigheid..... en miskien ..... betrokke te wees by die.... die assessering... kan selfs dink om mense van Huisartskunde ook te betrek....."</p> <p>"should a programme be compiled or a curriculum be developed, someone who does have clinical experience of electrocardiography should be involved... in an advisory capacity..... and perhaps be involved in.... the assessment... can even think of involving people from Family Medicine...."</p> <p>30: "dit klink asof dit ook nie 'n superpesialis moet wees nie....." "it sounds as if it also must not be a super specialist..."</p> <p>34: "... not theoretical like the cardiologists"</p>

<p>ECG is appropriate as community-based learning task for undergraduate medical education</p>	<p>Challenges and prerequisites for success</p>	<p>CPR</p>	<p>12: "baie van die staatsinstansies sou bv. nie EKG masjiene hê nie"  "many of the state institutions would, for example, not have ECG machines"  23: "baie geskik, mits die apparatuur beskikbaar is....." "very appropriate, provided the apparatus is available..."  29: "...beskikbaarheid van apparate...."  "... availability of apparatus... "  32: "baie van die klinieke gaan nie EKG masjiene hê nie" many of the clinics will not have ECG machines"  18: "Wie gaan die interpretasie doen wanneer hulle dit op 'n pasiënt doen?..... Wie gaan daardie pasiënt verwys?  "Who is going to do the interpretation when they do it on a patient?... Who is going to refer that patient?  27: "die toesighouer.... het hulle genoegsame kennis om dit te kan leer?" "the supervisor... have they got sufficient knowledge to teach it?"  30: "so hy moet 'n 'try' vat op die aflei en iemand anders moet by wees om hom te 'supervise'..... Sodra jy in die periferie sit, dan kort jy gewoonlik toesig" "so he must take a 'try' on the registration and someone else must be nearby to 'supervise'.... If you are in the peripheral areas, then you usually do not have supervision"  14: "n mens moet in gedagte hou wat wil ek bereik met die sessie..... kommunikasie-vaardighede..... help iemand om te posisioneer"  "a person must keep in mind what do I want to achieve with the session..... communication skills... help to position someone"  26: "is not... hmm... a tool that you can say ...you are maybe screening for something or another... have to select patients"</p>
	<p>Other suitable community-based tasks</p>	<p>OST1</p>	<p>14: "...bloed trek..." "... draw blood... "  26: "can do urine, for example: it is cheaper"  32: "bloeddruk, 'n meer basiese ding wat meer beskikbaar is"  blood pressure, a more basic thing that is more readily available"</p>



<p>Most preclinical phase ECG learning outcomes can be addressed in the clinical skills and simulation units</p>	<p>Community-specific outcomes</p>	<p>CSO</p>	<p>4: "tegniese probleme wat absoluut uniek aan bepaalde pasiënte in omgewings is....." "technical problems that are absolutely unique to certain patients in environments..."</p> <p>14: kommunikasie..... werk met die pasiënt, hoe jy dit benader, ....hoe ek myself voorstel.... in 'n 'authentic' kondisie, soos bv. 'n kliniek..... hoe gebruik ek daardie 'skill' as 'n dokter in die regte lewe..... 'consent'..... posisionering, werk met 'n pasiënt wat nie lekker noodwendig saamwerk nie, wat se BMI dalk baie hoog is..... " Om die 'skill' te kan toepas in 'n breër konteks....." "communication... work with the patient, how you approach it,....how I introduce myself .... in an 'authentic condition', such as for example, a clinic..... how I use that 'skill' as a doctor in real life ... 'consent.... positioning, work with a patient that does not necessarily comply, whose BMI is perhaps very high....To be able to apply the skill in a broader context...."</p> <p>20: "jy kan met simulاسie baie leer, maar die een ding wat jy nie kan leer nie is om met 'n lewendige pasiënt te kommunikeer...." you can learn much with simulation, but the one thing that you cannot learn is to communicate with a live patient...."</p> <p>30: "party mense is dik en party is maer.....landmerke so 'contorted' dat jy nie weet waar om (die bobbel) te sit nie. En daardie goeters gaan jy nie op 'n 'manikin' kry nie." "some people are fat and some are thin....landmarks so 'contorted' that you do not know where to put (the suction cups). And those things you are not going to get on a manikin"</p>
	<p>General participant suggestions</p>	<p>GPS3</p>	<p>12: "as dit gekombineer kan word.....met ander take" "if it can be combined ... with other tasks"</p> <p>14: "baie handig wees om 'n opvolgessie in die gemeenskap te hê....." "very handy to have a follow-up session in the community...."</p> <p>15: "dalk 'n kombinasie moet wees: in die kliniese vaardigheidslaboratorium en in die gemeenskap" "must perhaps be a combination: in the clinical skills unit and in the community"</p> <p>16: "studente eers geassesseer word en die nodige refleksie doen.....geassesseer word aan die einde van semester vier en weer aan die einde van die eerste kwartaal van semester vyf.....die studente sal reflekteer op hierdie twee assesserings..... om hulle meer gereed te maak vir gemeenskapsgebaseerde elektrokardiografie, wat hulle dan moontlik aan die einde van semester vyf of begin van semester ses kan doen.....eers deur 'n assesseringsgeleentheid en refleksie te gaan, om te verseker dat verkeerde praktyke nie aangeleer word, deur bv. te vroeë blootstelling aan gemeenskapsgebaseerde EKG spesifiek nie." "....aantal studente..... sal dit net moet ondersoek..... mag moontlik wees dat 'n kliniese personeelid reeds in 'n bepaalde kliniek is....."</p> <p>"students are first assessed and do the necessary reflection ... are assessed at the end of semester four and again at the end of the first term of semester five... the students will reflect on these two assessments..... to make them more ready for community-based electrocardiography, that they then can possibly do at the end of semester five or beginning of semester six ... first by going through an assessment opportunity and reflection, to ensure that wrongful practices are not learnt, for example, by too early exposure to community-based ECG specifically."</p> <p>"....number of students... will just have to investigate it .... may be possible that a clinical staff member is already in a particular clinic..."</p>

	Other suitable community-based tasks	OST2	27: "bloeddrukke.....'drips' opsit, bloed trek.....kyk na die naels, kyk na die milt, kyk na die lewer....." "blood pressures... put up 'drips', draw blood...look at the nails, look at the spleen, look at the liver..."
The advantages of community-based ECG learning in semesters four and /or five do not justify the transport and tuition-related costs	Positive influencing factors	PIF	10: "In kombinasie, dink ek, regverdig dit dit definitief" 13: "'CBE' is ook 'n vereiste van die Raad....." 14: "....daar sal baie goeie dinge kan uitkom daaruit, met die breër uitkomstes" 23: "ordentlik beplan"
	Negative influencing factors	NIF	2: "gekontroleerde of beheerde situasies wat in die gemeenskap moeilik is....." 4: "fyn balans wees tussen die bereiking van die uitkomste en die onkoste ....." 20: "miskien dalk nie 'n EKG masjien of 'n werkende EKG masjien hê nie....." 27: "EKG's kos baie geld..... daar is nie plakkers nie; die EKG masjien is stukkend....." "ECGs cost a lot of money...there are no stickers; the ECG machine is broken..."
The advantages of community-based ECG learning in semesters four and /or five do not justify the extra time and/or staff required	General participant comments	Positive comments and solutions	PC 12: "As dit met iets anderste verbonde kan word....." 13: "sal help om integrasie te bevorder....." 18: "'n Proefperiode) sal van hierdie vrae kan beantwoord....." 22: "moet planne maak...." 23: "Kimberley..... Dit is ander personeel wat die werk daar gaan doen..... personeel wat buite die Vrystaat studente het: moniteringsrol" 28: "in julle kurrikulum gaan kyk: watse tyd dit gaan vat....."
		Negative comments	NC 8: "homself baie goed verleen tot die kliniese jare..." 29: "personeelbeskikbaarheid" 30: "gaan klomp ouens uit die werk hou"

	Combine with other tasks	CWOT	<p>3: : "...kan nie net een ding in, in afsondering doen nie" "...cannot just do one thing in, in isolation"</p> <p>4: "dat 'n ander taak gekoppel kan word aan, bv. 'n EKG taak" "that another task can be linked to, for example, an ECG task"</p> <p>12: "...as dit met ander take verbonde word, dink ek is dit die moeite werd" "...if it is linked to other tasks, I think it is worth it"</p> <p>14: "eerder twee of drie take te doen, wat die studente in die 'skills lab' geleer het....." "rather do two or three tasks, that the students learnt in the 'skills lab' "</p> <p>15: ".....nie net 'n EKG bepaling doen nie....." "not only do an ECG recording...."</p> <p>18: "die een kan nie eintlik sonder die ander een nie" "the one cannot really be without the other"</p> <p>27: "as jy dit kan doen en die pasiënt se bloeddruk neem..." if you can do it and take the patient's blood pressure..."</p>
Another CVS-related task will be more suitable for CBL in semesters four and /or five	Tasks deemed more suitable	TDMS	<p>10: "...bloeddruk...." "...blood pressure....."</p> <p>14: ".....bloed trek..... bloeddrukbeplating..... BMI.....'hip-waist ratios'....." "... draw blood... blood pressure measurement... BMI..... hip-waist ratios....."</p> <p>15: "bloeddrukbeplating..... kardiiovaskulêre risikobepaling" "blood pressure measurement..... cardiovascular risk assessment"</p> <p>18: "bloeddrukbeplating" "blood pressure measurement"</p> <p>21: "kardiiovaskulêre geskiedenis en/of gesondheidsinligting..... voorligting" "cardiovascular history and/or health information.....counselling"</p> <p>22: "kliniese ondersoek van jou kardiiovaskulêre stelsel bly primêr" "clinical examination of your cardiovascular system remains primary"</p> <p>25: ".....'n bloeddruk....." "... a blood pressure..."</p> <p>27: "kardiiovaskulêre ondersoek.....bloeddruk, bepaling van die pasiënt se volumestatus, met JVP en al die ander goed saam....." "cardiovascular examination...blood pressure, determination of the patient's volume status, with JVP and all the other things together..."</p> <p>28: ".....bloeddruk.....pols neem.....geskiedenis" "...blood pressure..assess the pulse... history"</p> <p>29: "kardiiovaskulêre risikobepaling.....bloeddruk" "cardiovascular risk assessment..... blood pressure"</p> <p>30: "perifere edeem of om te kyk vir tekens van hartversaking .....glukoses" "peripheral oedema or to look for signs of cardiac failure.....glucoses"</p> <p>31: 'n goeie basiese geskiedenis....'n baie volledige geskiedenis van die kardiiovaskulêre sisteem.....bloeddruk neem en....en pols neem en luister na die hart....." "a good basic history ... a very complete history of the cardiovascular system... . take blood pressure and...and pulse and listen to the heart..."</p> <p>32: ".....bloeddruk....." "...blood pressure..."</p> <p>33: ".....blood pressure.....urinalysis.... fundoscopy"</p> <p>34: ".....counselling about the results of the smoking... plus about the obesity and the exercise..."</p>

			walking.... lifestyle modifications related to the cardiovascular system"
Community-based ECG learning can be implemented in the preclinical phase of the UFS curriculum	Determining factors	DF	<p>3: "As die fasiliteite daar is....." "If the facilities are there"</p> <p>7: "personeel en `equipment', `resources' "</p> <p>"personnel and equipment, resources"</p> <p>10: "Party plekke.....het nie al die toerusting ....." "Some places... do not have all the equipment..."</p> <p>12: ".....met die toerusting wat nie daar is nie..." "...with the equipment that is not there....."</p> <p>15: "hoeveel personeel.....hoe dikwels....." "number of personnel.....how often..."</p> <p>20: ".....die logistiek sal dit bemoeilik .....houding. Jy kan alles doen wat jy wil....."</p> <p>".....the logistics will make it difficult.....attitude. You can do everything that you want to....."</p> <p>25: ".....beskikbare tyd....." ".....available time..."</p> <p>28: ".hoe dit inpas by die prekliniese kurrikulum: dat jy nie ander goed wat miskien belangrik is uitskuif daarvoor nie....." ".....how it fits in with the preclinical curriculum: that you do not move other things out, that are perhaps important for it ...."</p> <p>31: "...besikbaarheid van personeel, vervoer, geld ens...."</p> <p>"availability of personnel, transport, money etc."</p> <p>32: "Ek dink nie die logistiese goed is in plek nie"</p> <p>I do not think the logistical things are in place"</p> <p>34: "..... you need the programme director....."</p>
General attitude and opinion regarding community-based ECG learning in the UFS preclinical phase	Reasons for support	RS1	<p>1: "blootstelling....." "exposure...."</p> <p>3: "....hoe meer besef hulle die belang daarvan...." "...the more they realise the importance thereof...."</p> <p>4: ".....dit sal ook aan die studente tuisbring die erns en belangrikheid daarvan en watter waarde die EKG kan toevoeg..."</p> <p>"...it will also convey to the students the seriousness and the importance thereof and which value the ECG can add..."</p> <p>29: "'real life experience' is better than ..... than with models and dolls."</p>
	Concerns	C1	<p>14: "uikomste moet reg geskryf word..... anders raak hulle net gefokus op die `skill' en nie op die konteks van die pasiënt nie..... fokus op `consent'..... interaksie..... taal..... rapport bou, kliniese kommunikasie.....".</p> <p>"outcomes must be written correctly.....otherwise they only become focussed on the skill and not on the context of the patient ... focus on consent... interaction... language.... building rapport, clinical communication..."</p> <p>28: "moet beperk word tot die basiese goed wat op daardie stadium inneembaar is....."</p> <p>"must be limited to the basic things that are understandable at that stage..."</p> <p>29: "baie mooi moet gaan kyk na die groepgrootte en die beskikbaarheid van ondersteunende personeel...." "jy doen `n EKG en daar is `n abnormaliteit.... dan gaan iemand iets daaraan moet doen"</p> <p>"must go and look very carefully at the group size and the availability of support personel"</p> <p>"you perform an ECG and there is an abnormality.... then someone must do something about it"</p>

Community-based ECG learning can be implemented in the UFS clinical phase	Reasons for support	RS2	<p>12: "Dit kan byvoorbeeld met die..... elektief by Huisartskunde verbonde wees..... in 'n gemeenskapsgebaseerde rotasie in Interne....."</p> <p>"it can, for example, be linked to the..... elective at Family Medicine.... in a community-based rotation at Internal Medicine..."</p> <p>28: ".....as hulle miskien by Huisartskunde inwoon....." "...if they perhaps rotate at Family Medicine..."</p> <p>20: "baie stimulerend om iets regtig te doen" "very stimulating to really do something"</p> <p>30: "Kliniese fase: gaan hulle reeds vir ander redes..... Die sisteem bestaan alreeds vir dit."</p> <p>"Clinical phase: they already go for other reasons..... The system already exists for it"</p>
	Concerns	C2	<p>28: "...ek dink nie dit is prakties uitvoerbaar nie.....ons sukkel om die goed in die hospitaal alles gedoen te kry..... kardiologie inwoning.....in die tyd wat ons die studente sien, is dit nie haalbaar om hulle nog uit te stuur....."</p> <p>"...I do not think it is practicable...we experience problems to get everything done in the hospital .... cardiology rotation... in the time that we see the students, it is not possible to also send them out..."</p> <p>30: ".....die naaste wat hulle in die gemeenskap kom is ....is Pelonomi"</p> <p>".... the nearest they get into the community is.... is Pelonomi"</p>

**TABLE 5.4: GENERAL COMMENTS REGARDING THE IMPLEMENTATION OF COMMUNITY-BASED ELECTROCARDIOGRAPHY LEARNING DURING SEMESTERS FOUR AND FIVE**

THEME	CATEGORY	CODE	RESPONDENTS' COMMENTS (DENOTED BY INTERVIEW NUMBER)
Benefits of early exposure	Student-related	SR	<p>10: "baie goed vir die studente om die goed te sien, dan onthou hulle dit baie beter."  "very good for the students to see the things, then they remember it much better."</p> <p>13: "gaan integrasie bevorder.....want hulle kry reeds vroeër met pasiënte te doen..... leer in konteks"  "will promote integration..... because they already get to do with patients earlier ..... learn in context"</p> <p>14: "pasiente wat nie so saamwerk, wat nie noodwendig die taal verstaan nie, wat nie so vinnig beweeg en moeilik op die bed klim.....'n ander liggaamshabitus het..... Dit gee insig oor hoe is dit in die regte lewe om hierdie vaardighede te gebruik"  "patients that do not cooperate, that do not necessarily understand the language, that do not move so fast and experience difficulty getting on to the bed.....have another body habitus ..... It provides insight into how it is in real life to use these skills"</p> <p>17: ".....opleiding sal soveel beter wees en.....veral met hartsiektes ens. wat soveel morbiditeit en mortaliteit veroorsaak....."  ".....training will be so much better and.....especially with cardiac diseases etc. that cause so much morbidity and mortality....."</p> <p>21: "ek dink die studente sal ook hou daarvan: .....dit gaan hulle prikkel....."  "I think the students will also like it: .....it will stimulate them....."</p> <p>26: "...the sooner the students know about the complications of common, chronic conditions and how to sort of..... hmm.....diagnose.....like early signs of maybe abnormal ECG....., the better...."</p> <p>31: "...daar is niks wat kontak en praktiese toepassing van jou leer meer positief kan beïnvloed as kontak met pasiënte in die gemeenskap nie.... die pasiënt se houding....."  "....there is nothing that can influence contact and practical application of your learning more positively than contact with patients in the community.... the patient's attitude....."</p> <p>32: "Dit motiveer hulle....." "It motivates them....."</p>

	Community-related	CR	<p>1: "kan hierdie studente dalk pasiënte optel wat nie eers geweet het hulle het 'n kardiovaskulêre probleem nie....."</p> <p>"these students can perhaps pick up patients that did not even know that they have a cardiovascular problem ....."</p> <p>7: ".....miskien sal die genmeenskap dan ook baat uit die leer....."</p> <p>".....perhaps the community will then also benefit from the learning....."</p> <p>13: "screening'.....kan 'n mens dalk iets optel op so 'n manier....."</p> <p>"screening'..... a person can perhaps pick up something in such a way ....."</p> <p>26: "in the community here in South Africa hypertension is a real.....high up on the list and diabetes is high up on the list and we know those two are both risk factors for heart disease....."</p>
Prerequisites or challenges regarding implementation	Material resources-related	MRR	<p>4: "Hulle sal 'n goeie kliniese mentor ook nodig hê in hierdie verband. ....dit moet gestruktureerd wees. Die uitkomst moet baie duidelik geskryf wees"</p> <p>"They will also require a good clinical mentor in this regard..... it must be structured. The outcomes must be written very clearly"</p> <p>5: "vervoer....toesig" "transport.... supervision"</p> <p>7: "behoeftebepaling moet doen....'equipment'..... geld..... vervoer' "</p> <p>"must do a needs analysis...equipment..... money..... transport' "</p> <p>10: "groepie moet presies so groot moet wees dat jy met een vervoer kan gaan, of twee..... 'n sessie van 6 ure....." "small group must be exactly so big that you can go with one 'transport', or two..... a session of six hours....."</p> <p>12: "daar baie fasiliteite is wat net nie voldoende toerusting het om studente.....hmm.....goed genoeg te leer...." "there are many facilities that just do not have adequate equipment to teach students.....hmm....well enough...."</p> <p>13: "dit gaan geld kos, soos vervoer, verblyf as dit in 'n ander....sê maar dit is Kimberley en hulle moet dalk 'n nag oorslaap en personeel..... jy gaan waarskynlik 'n persoon of twee nodig hê wat die ding bestuur." "..... die finale interpretasie:..... moet dan deur 'n konsultant gedoen word of een of ander spesialis.....Jy kan dit selfs elektronies stuur....."</p> <p>"it is going to cost money, like transport, accommodation, if it is in another.... let's say Kimberley and they must perhaps stay overnight and personnel..... you are probably going to need one or two persons that can manage the thing" "the final interpretation.....must be done by a consultant or some</p>

		<p>or other specialist.....You can even send it electronically .....</p> <p>14: "dieselselfde 'resources'..... personeel kan net op 'n ander plek dit gaan 'teach' "</p> <p>"the same 'resources'..... personnel can just go and teach it at another place"</p> <p>15: "definitief meer navorsing gedoen moet word om te kyk of dit wel moontlik sal wees.....omskakeling van ...van kennis tot die praktiese toepassing daarvan en dit sal goed wees as 'n mens kan gaan kyk wat... wat kan gedoen word om daardie.....hmm.... gaping te oorbrug."</p> <p>"more research definitely must be done to look if it indeed will be possible ....conversion of knowledge to the practical application thereof and it will be good if a person can go and look what..... what can be done to bridge that.....hmm.... gap."</p> <p>16: "die aantal studente wat uitgeplaas kan word. 'n Mens sal dit net moet ondersoek."</p> <p>"the number of students that can rotate. One will just have to investigate it."</p> <p>17: "vervoer en onkostas...." "transport and costs....."</p> <p>18: "die interpretasie van EKGs, veral met patologie.....Is daar genoeg personeel om daardie student te help?.... Die personeel van die kliniek.....beïnvloed hulle ook..... pasiëntgesondheid, pasiëntregte"</p> <p>"the interpretation of ECGs, especially with pathology..... Are there sufficient personnel to help that student?.... The personnel of the clinic..... influences them too.."</p> <p>21: "Logisties..... veral vervoer vir die studente..... baie keer gaan daar byvoorbeeld nie 'n masjien wees wat werk nie.....moet maar een saamneem."</p> <p>"Logistically.....especially transport for the students ..... many times, for example, there will be no functional machine .....must then just take one with....."</p> <p>26: "look at the machines that are in the community. Are they calibrated?"</p> <p>27: "die instrukteur moet voorbeelde hê van EKGs....jy gaan dalk 'n paar fibrillasies nou en dan sien. ....dat hulle daardie boek van Dubin moet koop"</p> <p>"the instructor must have examples of ECGs.....you may see a few fibrillations now and then. ....that they must buy that book of Dubin"</p> <p>30: ".....hoeveel spasie vat dit om hierdie ding te doen?.... Klinieke is besig.....Waar het jy 'n masjien gesien? In noodgevalle. ....daar is 'n noodgevalle afdeling in MUCPP....en daar behoort 'n masjien te wees.....Die spasie is opgeneem deur die HIV kliniek....."</p> <p>".....how much space does it take to do this thing?.... Clinics are busy..... Where did you see a machine? In casualties. ....there is a casualties department at MUCPP... and there should be a</p>
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			<p>machine..... The space is taken up by the HIV clinic.....”</p> <p>32: “.....die fasiliteite in jou klinieke..... daar is baie klinieke wat nie EKG masjiene het nie.....”</p> <p>“.....the facilities in your clinics..... there are many clinics that do not have ECG machines.....”</p> <p>33: “we need to make sure the facilities’ equipment is running. And normally we run out of stickers.....make sure they are there....the paper is there.....it is well calibrated.....physician working there should also have an interest..... be able to analyse and help and interact with the students.....transportation”</p>
	<p>Non- material resources- related</p>	<p>NMRR</p>	<p>2: “kliniese gevalle.....moet baie tipiese gevalle wees....”</p> <p>“clinical cases..... must be very typical cases.....”</p> <p>6: “praktiese komponent moet so naby as moontlik aan die teorie komponent wees, sodat die een die ander een kan versterk.....saam met ander projekte wat alreeds aan die gang is”.</p> <p>“practical component must be as close as possible to the theory component, so that the one can strengthen the other... with other projects that are already being implemented”.</p> <p>7: “hoe gaan jy jou toeretiese kennis oordra.....in praktyk”</p> <p>“how are you going to convey your theoretical knowledge..... in practice”</p> <p>10: “in kombinasie met iets anderste doen.... pols en bloeddruk en .....kliniese goete.”</p> <p>“do it in combination with something else.....pulse and blood pressure and .....clinical things.”</p> <p>11: “seker te maak dat dit geïntegreer word binne in die kurrikulum, dat dit nie losstaande is en apart aangebied word nie; dit moet binne konteks plaasvind”</p> <p>“moet konstruktief belyn word met die uitkomst van die spesifieke M.B.,Ch.B. program.....geïntegreer word met die leerontwikkeling en die leermateriaal....”</p> <p>“make sure that it is integrated in the curriculum, that it is not separate and presented separately; it must occur in context.”</p> <p>“must be constructively aligned with the outcomes of the specific M.B.,Ch.B. programme.....be integrated with the learning development and the learning material....”</p> <p>16: “eers deur `n assesseringsgeleentheid en refleksie te gaan, om te verseker dat verkeerde praktyke nie aangeleer word.... beskikbaarheid van personeellede, veral prekliniese personeellede. Dit mag moontlik wees dat `n kliniese personeellid reeds in `n bepaalde kliniek is.....”</p> <p>“to first go through an assessment opportunity and reflection, to ensure that wrong practices are not learnt..... availability of personnel, especially preclinical personnel. It may be possible that a clinical</p>

		<p>staff member is already in a particular clinic.....”</p> <p>20: “Skep goeie riglyne vir die studente sowel enige ander persoon wat daarby betrokke is. ....kry `n eenvoudige formaat vir die student om volgens te werk en kry `n kampioen wat dit sal deurdruk.”</p> <p>“Formulate good guidelines for the students as well as any other person involved..... get a simple format for the student to work according to and get a champion that will push it through.”</p> <p>21: “Logisties..... Gaan baie organisasie daar ingaan..... Daar gaan baie tyd daar ingaan..... .....samesamewerking van die kliniekpersoneel... die identifiseer van pasiënte.....sal grootliks op die dosent moet afkom.....vir een.....maksimum twee sessies in die gemeenskap vat.....”</p> <p>“Logistically..... A lot of organisation will go into it..... A lot of time will go into it..... .....cooperation of the clinic personnel... the identification of patients..... will mainly be the responsibility of the lecturer .....take for one..... .....maximum two sessions into the community...”</p> <p>23: “kort net beplanning” “just requires planning”</p> <p>24: “dit moet baie goed beplan word.....” “it must be planned well.....”</p> <p>25: “die tydaspek” “the time aspect”</p> <p>27: “rugsteuningsplan in plek....” “a strategic plan in place.....”</p> <p>28: “.....binne konteks bly van wat hulle kan doen op daardie stadium of behoort te doen en dat dit inpas by julle kurrikulum.”</p> <p>“.....remain within context of what they can do or must do at that stage and that it fits in with your curriculum.”</p> <p>29: “.....daar sal moet `n protokol wees: wat doen ons as ons leergroepie `n abnormaliteit kry en wat om te doen en hoe hanteer ons dit.”</p> <p>““.....there will have to be a protocol: what do we do if a small learning group gets an abnormality and what to do and how we manage it..”</p> <p>33: “....should have more practice time..... before they go and practise on a real patient.....”</p>
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