



PHD

**EVALUATION OF THE IMPLEMENTATION AND ASSESSMENT OF AFRIMEDS
PHYSICIAN COMPETENCY FRAMEWORK IN AN UNDERGRADUATE MEDICAL
PROGRAMME: A SOUTH AFRICAN MIXED- METHODS CASE STUDY**

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METHODS CASE STUDY**

by

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The material presented here for examination for the award of a higher degree by research has not been incorporated into a submission for another degree. I am the author of this thesis, and the work described therein was carried out by myself personally.

Nathaniel Mofolo

Abstract

Aim and background: The study evaluates the University of the Free State (UFS) MBChB programme in relation to its implementation and assessment of the AfriMEDS physician competency framework. The Health Professions Council of South Africa (HPCSA), in collaboration with the South African Committee of Medical Deans (SACoMD), adopted and adapted the CanMEDs physician framework in 2014 by incorporating community-based education and a community-oriented approach to healthcare training, and this became the AfriMEDS physician framework. This framework provides an evaluation of physician competencies for medical students in the eight competency roles: medical expert, communicator, scholar, collaborator, professional, leader and manager, health advocate, and community-based education.

Methodology: The study employed mixed-methods case study design using the UFS MBChB programme as a case study. The methods involved qualitative methods, namely, document analysis and virtual interviews with educators, and quantitative methods by using a cross-sectional survey conducted among medical interns who graduated from UFS and were doing first- and second-year internships in 2020.

Results: The findings of the study revealed that AfriMEDS graduate competencies are superficially implemented at the UFS and that some competencies are more challenging to teach and assess than others. The results from document analysis reveal that the core competencies of health advocate, leader and manager, and scholar feature less prominently across all phases, while professional and health advocate role assessment tools are not mentioned in the phase guides of the UFS undergraduate medical programme. The tools of assessment mentioned in the MBChB phase guide booklets are not in line with the recommended tools used to assess the CanMEDS (AfriMEDS) competency framework.

A total of 71 medical interns took part in the online survey, and 15 educators participated in virtual interviews. More than 80% of the medical interns felt that they were sufficiently trained and prepared for internship (80%). Most of the medical interns rated the sufficiency of competencies very high (over 80%), with the exception of leader and manager (63%), community-based education (71%), collaborator (72%), and communicator (79%). These results were closely similar to educators' findings.

Conclusion and recommendations: The study identified challenges, barriers, and gaps affecting the effective implementation of the AfriMEDS competency framework. Lack of staff, increasing number of students, lack of sufficient time, COVID-19 impact, and limited clinical exposure are factors that need to be addressed to enhance internship experience and undergraduate training. The study concludes by showing that a framework, guidelines, and benchmarked assessment tools are needed to infuse the AfriMEDS framework to transform the UFS MBChB programme and curriculum.

SUMMARY

Background

Graduate attributes (GAs), according to Bowden et al. (2000:262), are defined as qualities, skills, and understandings a university community agrees its students should develop during their time with the institution. These attributes include, but go beyond, the disciplinary expertise or technical knowledge that has traditionally formed the core of most university courses. GAs are qualities that prepare graduates to be agents of social good in an unknown future. GAs are sometimes referred to as generic skills or professional skills or graduate competencies, and often the terms are used interchangeably; however, there are differences between the two terms – unlike GAs, professional skills in the context of health sciences studies are observable abilities of health professionals, which integrate multiple components, such as knowledge, skills, values, and attitudes, whereas generic skills are universal qualities and skills that a graduate should acquire and not discipline specific. Since competencies are observable, they can be measured and assessed to ensure their acquisition. The aim of GAs is to equip students with the competencies they need to make their educational experience transformative, thus meeting the needs of society.

In 1996, the Royal College of Physicians and Surgeons of Canada adopted a competency-based medical education (CBME), which is known as CanMEDS. The International Competency-Based Medical Education collaborators endorsed the CanMEDS framework internationally in 2009. The Health Professions Council of South Africa (HPCSA), in collaboration with the South African Committee of Medical Deans (SACoMD), adopted the framework in 2014, though SACoMD renamed CanMEDS AfriMEDS, with the intention of making the framework more Afrocentric and relevant to the African context. The concomitant adoption of the AfriMEDS physician competency framework required a paradigm shift, or transformation, in the context of South African medical education and, therefore, the emphasis was on the incorporation of community-based education and a community-oriented approach to healthcare; this formed the basis for and the appropriate context in which AfriMEDS was introduced. Community-based education is sometimes referred to as *decentralised training*, which is defined as training activities for undergraduate medical students that take place away from tertiary academic complexes, for example, healthcare centres, primary care clinics, and district and rural hospitals. Other terms that are used in literature to describe decentralised training are distributed learning, community-based education, off-campus training, and rural training. This work argues that

the AfriMEDS physician competency framework requires a case study to explore the users' experience of AfrimedS and to evaluate those using the AfriMEDS framework to measure its successes and shortfalls. There are currently no available guidelines to evaluate AfriMEDS physician competencies implementation and assessment in South Africa, and to do so, the University of the Free State (UFS) was used as a mixed-methods case study.

Aim

The study aimed to evaluate the implementation and assessment of AfriMEDS by medical interns completing either their first or second years of internship (medical residency) in 2020, and who had studied at UFS. Internship training in South Africa involves two years of experiential learning for Bachelor of Medicine and Bachelor of Surgery (MBChB) graduates, which is regulated by the HPCSA. This experiential learning can only be performed under the supervision of senior medical practitioners at an HPCSA-accredited facility.

Goal

The study was focused on the evaluation of the implementation and assessment of milestones achieved in entrenching the AfriMEDS physician competency framework in post-apartheid South African medical school systems. It elucidates AfriMEDS components, such as scholar, professional, collaborator, communicator, advocate, leader and manager, and community-based education and their implementation, which intend to address society's needs. Community-based education is emphasised, as is adopted by the HPCSA and SACoMD as a relevant primary care experience for clinical associates and medical and dental students who service remote, underserved communities in order to make CanMEDS components relevant for the South African context, hence the AfriMEDS framework. The AfriMEDS framework has since been used by the HPCSA to accredit undergraduate medical programmes in South Africa.

Setting

The study was conducted towards the end of 2020 at the medical school of UFS in South Africa and makes particular reference to its undergraduate medical programme. UFS is the only medical school in South Africa that offers a five-year undergraduate medical programme – other medical schools offer a six-year programme. The success of this

programme in relation to the implementation of the AfriMEDS framework at the institution was evaluated in the context of socio-political transformations that have taken place. A distinction was drawn between the pre- and post-apartheid periods, the former representing the apartheid regime and the latter focusing on the process of constituting a democratic dispensation after 1994.

Methods

The study followed a mixed-methods case study design that employed both qualitative and quantitative methods. The first part used qualitative methodology, through

- (a) Analysis of secondary documents to review the undergraduate medical curriculum and documents used to implement and assess CBME components. This step assisted in broadening the conceptualisation of the problem, formulating research questions, and generating empirical data; and
- (b) Focused, semi-structured individual virtual interviews with educators involved in undergraduate medical teaching throughout the years, and the MBChB programme coordinators and director.

The second part employed quantitative methodology, using an online questionnaire that was distributed to newly qualified medical interns completing either their first- or second-year internship (medical residency) in 2020, who had studied at UFS. The online questionnaire determined the extent to which graduate AfriMEDS physician competencies were embedded during their training and how these competencies were applied during their internship.

Ethical approval was received from the Ethics Committee of the Faculty of Health, University of the Free State, with reference number: HSD2020/1420, and from the Social Sciences Research and Ethics Committee, University of Bath, with reference number: S20-068. Permission to conduct the study was also received from the National and Provincial Health departments. The study targeted educators involved in the medical undergraduate programme and the medical students who had graduated and were busy with medical internship in 2020. Participants were informed that data would be handled with complete confidentiality, and participation in the study was voluntary. All participants consented to their involvement in the study.

Results

Different viewpoints were elicited from educators and interns, describing how the UFS undergraduate medical programme can be transformed to embed AfriMEDS competencies in the curriculum. Most of the medical interns rated the sufficiency of competencies very high (over 80%), with the exception of leader and manager (63%), community-based education (71%), collaborator (72%), and communicator (79%). The study identified challenges, barriers, and gaps that affect the effective implementation of the AfriMEDS competency framework, namely, lack of staff, an increasing number of students, lack of time and limited clinical exposure, COVID-19 impact, insufficient resources to support benchmarking and assessments tools, and a lack of institutional and faculty support.

Drawing from both the literature and the study findings, the core components were organised to create a revised AfriMEDS framework. This ultimately culminated in the development of guidelines for the AfriMEDS framework.

Since the aim of the study was to evaluate the implementation of AfriMEDS and develop an AfriMEDS framework. It is therefore intended that the results of the evaluation of the UFS MBChB in implementing and assessing the AfriMEDS framework, feeds into the proposed draft graphical representation of the AfriMEDS framework, and when it is implemented its guidelines will transform pedagogy at the UFS and South African medical schools so that its medical education and training meets the accreditation needs of the HPCSA, and satisfies the AfriMEDS framework.

Keywords: graduate attributes, competency-based medical education framework, guidelines, evaluation, assessment

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LIST OF ABBREVIATIONS AND ACRONYMS

AACU	Association of American Colleges and Universities
ADRI	Approach Deploy Review Improve
AIDS	Acquired Immune Deficiency Syndrome
ACGME	Accreditation Council for Graduate Medical Education
AfriMEDS	African education framework based on CanMEDS
CBE	Community-Based Education
CBME	Competency-Based Medical Education
CHE	Council on Higher Education
COPC	Community-Oriented Primary Care
GA	Graduate Attribute
HEQC	Higher Education Quality Committee
HIV	Human Immunodeficiency Virus
HPCSA	Health Professions Council of South Africa
ICBME	International Competency-Based Medical Education
IPE	Interprofessional Education
ITER	In-Training Evaluation Report
LDP	Learning Development Programme
MBChB	Bachelor of Medicine and Bachelor of Surgery
MCQ	Multiple-Choice Question
MIMA	Integrated Medical Science Assessment
MSF	Multi-Source Feedback
MSSM	Epidemiology, Biostatistics and Special Study Module
NGRC	National Health Research Committee
NMFCMP	Nelson Mandela-Fidel Castro Medical Programme
OSCE	Objective Structured Clinical Examination
PBL	Problem-Based Learning
SACoMD	South African Committee of Medical and Dental Deans
SAQ	Short-Answer Question
UFS	University of the Free State

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

The fundamental question is, what makes a competent doctor? How do we decide that a medical trainee is competent enough to serve the public? In this research project, the researcher undertook an extensive study to answer the aforementioned questions with the aim of evaluating the implementation and assessment of the AfriMEDS physician competency framework in an undergraduate medical programme using the University of the Free State (UFS), South Africa, as a mixed-methods case study.

Society is interested in the quality of medical education and expects a well-rounded, trained doctor, while students have the right to good quality education (Vroeijerstijn, 1995). The United Kingdom's Medical Schools Council provides a list of core values and attributes that are needed to be selected to study medicine; this list is endorsed by all medical schools. It sets out what medical schools are looking for so that they can recruit and train students to become good doctors (Medical Schools Council, 2014). The World Health Organization (2013) proposes using selection methods and tests that reference non-cognitive attributes to prevent selecting students who possess what are considered unprofessional and personal characteristics that are likely to affect their ability to care for patients and work in a team. In the United States, the Association of American Medical Colleges (AAMC) launched a project to help medical schools formulate new admissions policies that consider multiple selection metrics – not only cognitive tests – that incorporate an applicant's "experiences, qualities and metrics" into the screening, application, and selection processes (AAMC, 2016).

Today concerns about patient safety and preventing errors, curbing rising medical costs, and fear of litigation are pervasive. Questions about the standard of care and quality of training are cause for concern (Wachter, 2010), today more than ever before. Therefore, there is mounting pressure on medical schools to ensure that they provide quality training and are accountable for the quality of doctors they produce (Malau-Aduli, Zimitat & Malau-Aduli, 2011). Quality assurance and assessment depend not only on measurement instruments and tools but also on the quality of faculty, staff, and students (Malau-Aduli, Zimitat & Malau-Aduli, 2011).

Research shows that, globally, Graduate Attributes (GAs) are seen to represent essential outcomes of tertiary education, in addition to disciplinary expertise and balanced disciplinary content (De la Harpe & David, 2012). As a result, students are rigorously selected according to socially accepted GAs (De la Harpe and David, 2012). The Draft Framework for Institutional Quality Enhancement of the Higher Education Quality Committee (HEQC) explains that quality student learning in South African higher education represents “a combination of an increase in the number of graduates that have attributes that are personally, professionally and socially valuable” (Council on Higher Education (CHE), 2014:ii). This means there must be an intersection between GAs and in preparing students as agents of social good.

1.1.1 Concepts of graduate attributes, competencies, and skills

The concepts of GAs have long existed in universities, and universities have been required to be accountable to governments, employers, students, and society at large (Barrie, 2005). Consequently, universities across the globe have been prompted to reconsider their curriculum development in an effort to make curricula more research-led and evidence-based, and more relevant to meeting societal needs and expectations (Prosser & Barrie, 2003). One comprehensive and useful definition of GAs is provided by Bowden et al. (2000:262):

The qualities, skills and understandings a university community agrees its students should develop during their time with the institution. These attributes include but go beyond the disciplinary expertise or technical knowledge that has traditionally formed the core of most university courses. They are qualities that also prepare graduates as agents of social good in an unknown future.

Given this definition, a greater number of public higher education institutions are increasingly concerned about the employability of their graduates in a rapidly changing world and how to make them active citizens who can contribute to economic and civil society (Barrie, 2006; De la Harpe & David, 2012). Even though the aims of GAs are noble, the critical discourse of this present time is the unknown future in a rapidly changing world, which is compounded further by the complexity of the coexisting pandemics of COVID-19, climate change, and the emerging 4th and 5th Industrial Revolutions (World Economic Forum, 2021). Thus, GAs must be able to address and meet these complex demands of the rapidly changing modern world.

Although attributes and skills (competencies) are terms that are often used interchangeably, they have different meanings. GAs are usually more overarching than skills and include qualities such as loyalty, commitment, honesty, and integrity (Nagarajan & Edwards, 2014). These qualities, which have been found to be highly desirable by governments, employers, students, and society (Barrie, 2005), are usually considered to be attributes rather than skills. Skills are conventionally practical, such as communication, time management, and teamwork (Nagarajan and Edwards, 2014). Thus, GAs are not a list of skills to be mastered; rather, they encapsulate both attributes and skills for both students and the wider community. They define characteristics of focus and achievements in a student's university degree programme(s). GAs can also be interpreted as both values and skills, or both skills and knowledge (Pitman & Broomhall, 2009). It is much more complex to measure GAs than skills, whereas certain attributes that pertain to the acquisition of psychomotor skills or competencies can be measured against a clear criterion-based model (Ipperciel & ElAtia, 2014). Competent, as defined by Merriam-Webster Online Dictionary, is "having requisite or adequate ability or qualities, or having the capacity to function or develop in a particular way". It could be claimed that, if one of the primary tasks of a doctor is diagnosing illnesses and providing management to improve the condition of patients, then a clinically competent doctor would be someone who has the knowledge, skill, judgement, and experience to diagnose correctly and, in addition, who is capable of providing appropriate treatment interventions (Burg, Lloyd & Templeton, 1982). Thus, professional competence describes a set of specific attributes that can be demonstrated and measured individually, whereas GAs are generic and applicable to the programme or discipline.

The need to develop a competency-based educational framework to evaluate and assess GAs has become a necessary framework of reference for the 21st century (Ipperciel & ElAtia, 2014). However, the desirable qualities of the "ideal" doctor have been difficult to define (Albanese et al., 2008). Consequently, evaluating and assessing GAs for medical doctors still remain, essentially, uncharted territory (Ipperciel & ElAtia, 2014).

1.2 GUIDELINES TO EVALUATE AND ASSESS AFRIMEDS

There is limited research or reports in literature on the use of guidelines to evaluate the implementation and assessment of the AfriMEDS or CanMEDS physician competency frameworks. It was, therefore, important to understand the difference between guidelines, frameworks, and standards.

According to South Africa's CHE, guidelines usually provide recommendations to an organisation and can be defined as follows: "Guidelines indicate why a particular standard is important, describe its salient features and indicates how standards could reasonably be interpreted and implemented in different contexts" (2021:7).

A framework is defined as a conceptual structure defined by the organisation to set out "key instruments to regulate the implementation of institutional policy" within an organisation (CHE, 2021:12). Standards, in turn, refer to "codes of practice for quality assurance used in higher education, which HEIs [higher education institutions] must consider and adhere to in all aspects of their activities and all types of higher education provision" (CHE, 2021:9).

The main benefits of guidelines are that they can be adapted to suit the context of the organisation, thereby allowing flexibility in implementation. They can be adjusted, modified, and scoped to work with organisational needs. The challenge is that their interpretation can be subjective, unless they are clearly defined. Guidelines are usually useful in the absence of frameworks or standards in an organisation.

The use of guidelines to evaluate and assess AfriMEDS graduate competencies, maybe seen as agents or tools that could lead to the revision or transformation of the curriculum. In order to revise or transform curriculum, there must be a curriculum mapping (Bath et al., 2004). Curriculum mapping is an assessment tool used to revise or transform an academic curriculum (Bath et al., 2004). Taking Figure 1.1 into account, the aim of the UFS MBChB programme is to provide a graduate profile mapped according to the AfriMEDS framework. This should generally state what the graduate has been enabled to do as a consequence of undertaking the specific programme of study. The AfriMEDS framework is then mapped to the SACMBE graduate attribute domains. The graduate profile is modified as necessary to ensure alignment with the university's expectations of graduates and the AfriMEDS framework. The programme will then justify the alignment of its graduate profile with the university's graduate attribute domains, as well as with the AfriMEDS framework.

Figure 1.1 shows the action learning cycle: planning, enacting, reviewing, and reflecting on the mapped curriculum, which is based on identified abilities that inform design and implementation strategies.

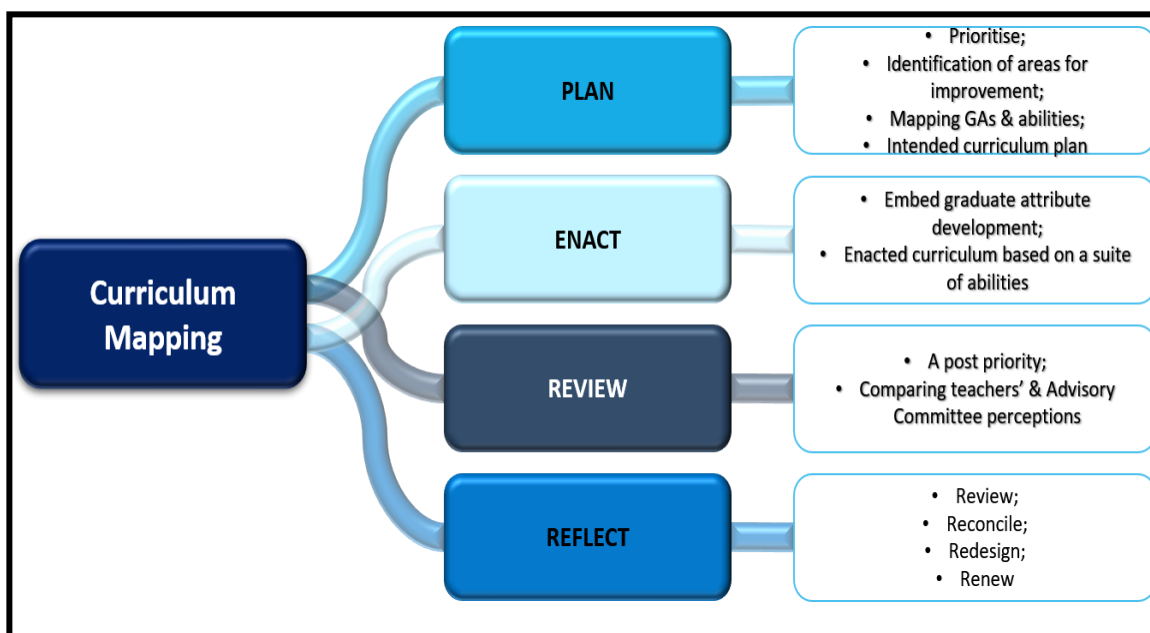


Figure 1.1: Action learning cycle: Curriculum mapping
Source: Bath et al., 2004

1.3 CHALLENGES ASSOCIATED WITH EMBEDDING GRADUATE ATTRIBUTES

This section will reflect on the challenges facing the constructive alignment required to embed and enact GAs in a curriculum. GAs, through the AfriMEDS competency framework, span every phase of the undergraduate programme, thereby preparing students for the 21st century through a variety of curriculum-based activities. The reflections will be captured in the subsections below.

1.3.1 Problem-Based Learning vs. Competency-Based Medical Education

Which are the best learning methods available to infuse graduate attributes in the university curriculum? Which learning method foster deeper learning?

Medical education has been evolving over the years, and the question of the quality of medical training that meets patients' needs and promotes patient safety has attracted global discourse among scholars and medical educators (Wachter, 2010).

The question of which learning pedagogy is best suited in an undergraduate and postgraduate medical program has been a subject of debate among scholars and medical educators for the last five decades (Trullàs et al., 2022). In the last 50 years, various university education models have tried to answer the question on the type of teaching

pedagogy that can reconcile teaching with learning, and which is based on the principle that students should direct their own learning process (Trullàs et al., 2022).

One of the most successful teaching models that has been used by the North American medical schools for more than 60 years is Problem-based learning (PBL), but has only been introduced to other global medical schools within the last 20 years (Trullàs et al., 2022). PBL has since been widely implemented in most medical schools all over the world and it 'appears to have gained traction as the preferred pedagogical strategy in medical education worldwide' (Trullàs et al., 2022).

The theory of PBL is based on the pedagogy and methodology that learning starts at identifying a problematic situation. The students are then guided to develop a hypothesis that identify the learning needs around the problem, so that they can better understand the problem and meet the established learning needs (Trullàs et al., 2022). PBL is usually facilitated by a tutor in small groups, to allow brainstorming and discussions, while key concepts are identified with key learning objectives. PBL allowed students an opportunity to integrate knowledge across subjects and simultaneously learn critical problem-solving skills which can be integrated into the medical curricula (Trullàs et al., 2022). Thus, on one hand, PBL is best suited for small groups, allows collaboration, and self-directed learning, and can be implemented in resource constrained environments, but tutors needs to be properly trained to implement it. On the other hand, CBME is outcome driven and more focused on the demonstration of the acquisition of specific skills, and tends to be resource intense, it can accommodate bigger number of students if the right assessment tool is being utilised, and can be tracked over time to direct learning (*cf.* 1.7., 2.11). PBL as a teaching pedagogy can be used in many different ways and to a lesser or greater extent within a curriculum, however, it is important to note that no one learning method is superior than the other, it all depends on context, and resource capacity.

1.3.2 Graduate attributes and assessment

CanMEDS has been formalised and accepted in the South African medical education system as AfriMEDS, and it has been assessed by the HPCSA as part of the accreditation process. It is now expected of medical educators to implement practical approaches to learner assessment of these competencies (Bandiera, Sherbino & Frank, 2006; Sherbino, Bandiera & Frank, 2008; Royal College of Physicians & Surgeons of Canada, 2014). Medical education experts accept that the competency project is still "in its infancy" (AFMC, 2012:4). Using

competency frameworks in defining a series of roles has been critiqued by several scholars because it discounts the concept of competence and its complexities. The issues associated with complexities relate to alignment with speciality-specific considerations and sustainable implementation (Gaboury et al., 2018).

It is also accepted by medical educators that some competencies are easier to teach and assess, especially those related to the medical expert role, while other non-medical expert competency roles, referred to as "intrinsic roles", seem to be more challenging to assess (Whitehead et al., 2015). Intrinsic roles are those roles that depict how medical professionals should perform in their interactions with others – interactions that are intrinsically contextual and culturally specific (Whitehead et al., 2015). The intrinsic roles in CanMEDS are collaborator, health advocate, leader (manager), communicator, and professional. This realisation led to concerns and fears that current assessment strategies do not ensure learner competence in these intrinsic competency roles and that assessment might be "artificial" and "contrived", and create conflict in meeting the accreditation standards and developing meaningful assessment tools (Whitehead et al., 2015). Whitehead et al. (2015) elaborate that the CanMEDS roles of advocate and collaborator are difficult to assess, as there are a number of intrinsic and extrinsic factors at play that involve interactions that can affect performance. This difficulty is compounded by multiple role players being involved in assessing CanMEDS competency roles, namely, medical educators, medical trainees, healthcare workers, patients and family members, and because they will have different cultural, social, and economic positions and lived experiences. External factors that play a role and have an impact on assessment are geography, sociocultural factors, and language. Assessment strategies and practices must, therefore, embrace and embed a wide range of concepts, including fairness, individual needs, safety, reliability, and validity and responsiveness to particular societal and community needs (Whitehead et al., 2015). Some of the strategies suggested by Whitehead et al. (2015) that need further exploration and research are the following:

- i. Ethnographic methodology, which is mainly employed in anthropology, uses data collection through participant observation, key informant interviews, and the analysis of textual artefacts; and
- ii. Realist evaluation underpinned by pragmatic, explanatory concepts uses a wide range of qualitative and quantitative data collection methods to develop a detailed understanding of the different contexts in which outcomes occur and mechanisms that outline those outcomes.

In response to numerous requests from medical educators for guidance on the assessment of CanMEDS, the Royal College of Physicians and Surgeons of Canada Office of Education developed assessment tools (*cf.* Appendix M). These assessment tools were drawn up after several sources had been consulted and databases searched for tools using the term “evaluation”, “assessment”, and “competence”, and were sorted by CanMEDS role.

1.3.3 Graduate attributes and quality assurance

Sometimes, introducing change to enhance assessment practices and embedding new approaches within teaching and learning practices in an organisation may be met with resistance, and cause confusion and concern (Malau-Aduli, Zimitat & Malau-Aduli, 2011). Introducing change initiatives may affect policies, procedures, resource allocation, and future workplace exchanges, and hold the possibility of job losses (Malau-Aduli, Zimitat & Malau-Aduli, 2011).

There is also a quality assurance process around assessment processes, such as blueprinting the educational objectives, selecting the appropriate test formats, and applying assessment strategies to achieve adequate levels of validity and reliability (Malau-Aduli, Zimitat & Malau-Aduli, 2011). To succeed in establishing acceptable quality assurance processes, constructive engagement with educators is important; this may be in the form of workshops for the peer review of assessment methods before they are administered to students (Malau-Aduli, Zimitat & Malau-Aduli, 2011). The research objectives of this study focused on quality assurance of GAs in student training. This process of quality assurance is described in Figure 1.2, which gives a synopsis of how GAs can be quality assured.

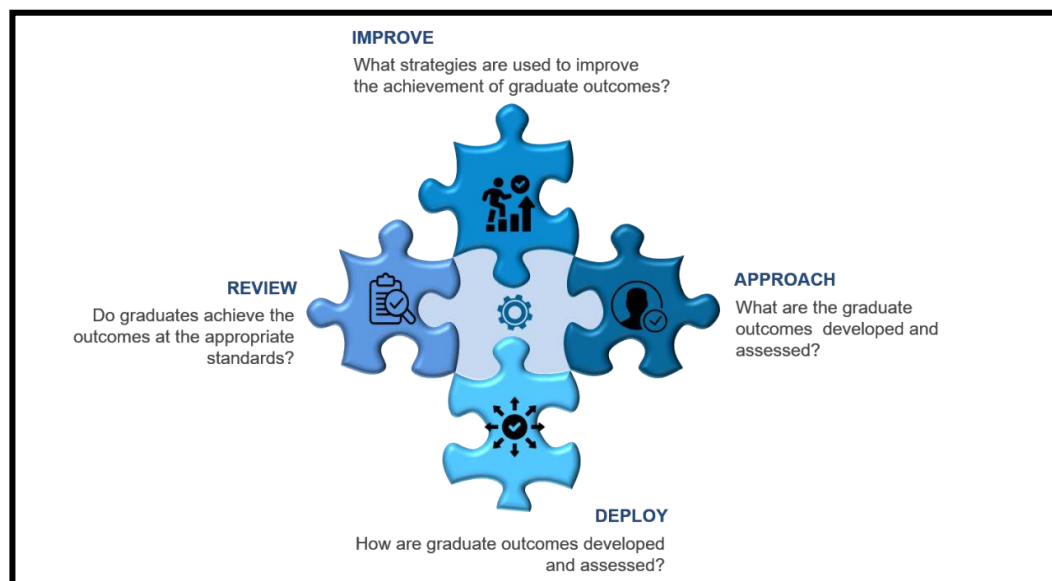


Figure 1.2: Assuring graduate outcomes using the ADRI model

(ADRI: Approach Deploy Review Improve quality assurance model) Source: Australian Learning and Teaching Council Ltd. 2011, p.8

1.3.4 Graduate attributes and the role of management, staff, and students

In addition to assessment, a number of other barriers that hamper the integration of GAs into curricula have been identified by academics; these include a lack of additional teaching and assessment time, limited resources for innovative approaches, little or no support for varied activities, and limitations around student readiness (including staff) for such engagement (Bond et al., 2017). Despite these barriers, staff often found it difficult to implement GAs when translating these “top-down” policies on GAs into the context of their own disciplines, since the learning and teaching of GAs are uniquely discipline-specific, and cannot be generalised and are not applicable to all disciplines (Wong et al., 2021).

GAs are now developed and branded by the senior management team to espouse the institutional mission and aspiration. However, whether the process and extent of institutional engagement on GAs among staff and students is satisfactory is doubtful (Wong et al., 2021). If a senior management “top-down” approach to implementing GAs is implemented unchecked, and if it is not shaped through discussions and negotiations between staff and students on what is ideally expected of university students – and not just during university graduation – it risks being irrelevant to or inconsistent with the views of staff and students, which hampers the embedding of GAs in transforming curricula (Wong et al., 2021).

1.3.5 The South African context and the AfriMEDS framework

In 1996, the Royal College of Physicians and Surgeons of Canada adopted a competency-based medical education (CBME) framework known as CanMEDS. The International Community-Based Medical Education (ICBME) collaborators endorsed this framework internationally in 2009. CanMEDS is an education competency framework that describes the abilities physicians require to effectively meet the healthcare needs of the people they serve. It serves as the basis for the education and practice standards of the Canadian Royal College of Physicians. The CanMEDS framework seamlessly integrates the competencies that define a competent physician into seven roles:

- Medical expert (the integrating role);
- Communicator;
- Collaborator;
- Leader (and manager);
- Health advocate;
- Scholar; and
- Professional.

In 2012, the Royal College of Physicians and Surgeons of Canada reviewed and updated the manager role to reflect the leader role better (Dath et al., 2015). The emphasis on the leader role was informed by the rapidly changing healthcare environment, which requires individuals to be attuned to taking part in healthcare reform and improving patient care. The adoption of the leader role was done without sacrificing managerial competencies (Dath et al., 2015).

In 2014, the Undergraduate Training Committee of the Medical and Dental Professions Board of the Health Professions Council of South Africa (HPCSA), together with the South African Committee of Medical and Dental Deans (SACoMD), accepted and adopted the CanMEDS framework for training clinical associates, and dental and medical students. It is envisaged that these competencies, which are based on the CanMEDS model of the Royal College of Physicians and Surgeons of Canada (Frank & Snell, 2010(b)), will be accepted by all professional boards of the HPCSA and will form part of the council's accreditation criteria. To emphasise its relevance for an African setting, the CanMEDS framework approach was termed AfriMEDS by the HPCSA. Adopting the CanMEDS in an African context by the HPCSA and SACoMD implied that matters of community-based education and a

community-oriented primary care approach were to be entrenched when clinical associates, and dental and medical students are trained in communities, whether urban, peri-urban, or rural. This implies that AfriMEDS includes CanMEDS, community-based education, and community-oriented primary care (COPC) and should be used to describe the attributes of all doctors, dentists, and clinical associates graduating in South Africa.

The emphasis on community in AfriMEDS is the result of healthcare in South Africa still being characterised by traits of structural apartheid, even though more than two decades have passed since the end of apartheid. Both the public and private sectors are impacted by population complexity and diversity and citizens' socio-economic backgrounds, languages, and literacy levels; hence, curriculum reform should be geared towards addressing population needs and inequalities in health (World Health Organization, 2013). The concept of community-based education becomes clear if one understands the main aim of community education. The Department of Higher Education and Training in South Africa describes the purpose of community education as follows:

Community education is about encouraging and engaging people throughout life into learning that is based on what they are interested in and that emerges in relation to problems and issues experienced on a daily basis. Education is developed that is relevant to the participating learners and is responsive to community priorities identified with people rather than for them (2012:54).

Community-based education is sometimes referred to as decentralised training, which is defined as training activities for undergraduate medical students that takes place away from tertiary academic complexes, for example, at healthcare centres, primary care clinics, and district and rural hospitals. Other terms that are used in literature to describe decentralised training are distributed learning, community-based education, community-engaged education, off-campus training, and rural training (De Villiers et al., 2017). COPC refers to community-focused healthcare interventions that are designed to address the burden of disease through health promotion, disease prevention, early detection, treatment of illness, community-based disease management, and rehabilitation (Bam et al., 2013). COPC is founded on the idea that people's health is based on social determinants in their environment. This means that, to achieve individual and population-level improvements in health, there needs to be a concurrent change in the social determinants of health (Bam et al., 2013). Thus, COPC should address individual health needs in the collective context of family and community.

In South Africa, poverty, inequality, unemployment, and hunger are the prevalent social ills

that plague communities (Statistics South Africa, 2013:22). There is, therefore, a need to develop guidelines to evaluate the achievement of the outcomes of the AfriMEDS competency framework. The framework and strategies for evaluating AfriMEDS implementation and assessment are still to be developed for South African medical undergraduate programmes.

AfriMEDS is significant because the principles enshrined in the CBME determine how training is structured, thereby offering the opportunity to medical schools to develop curricula that are relevant and that meet the needs of South African society.

1.4 RATIONALE AND STATEMENT OF THE RESEARCH PROBLEM

The following questions are relevant: How do we decide what to teach in a given medical curriculum? And how do we determine the adequacy and relevance of the curriculum? What is a competent graduate of the programme? To answer these questions, it is necessary to have an in-depth understanding of the desired outcomes of the programme. It is also important to define the outcomes from the onset. It is important to conduct a needs assessment first and then to evaluate the programme. The initial step is to determine the balance between the perceived needs, observed needs, organisational needs, and societal (community) needs.

Despite educators and policymakers in the healthcare professions paying renewed attention to CBME in recent years, consensus on many aspects of this transformative ideal is lacking. On the one hand, admission and selection criteria for medical schools have played a critical role in widening access, especially because the issue of social justice has attracted much debate globally, and the principles applied for admission and selection into medical school are clear. On the other hand, there is incongruity regarding the principles employed to discern the qualities a student requires to be a good doctor. Medical educators around the world have now acknowledged that structured assessments, such as objective structured clinical examinations (OSCEs) may not truly reflect all relevant aspects of learning that are needed to ensure competency in medical practice (Van der Vleuten et al., 2010).

Prior academic performance has the highest predictive validity for performance at medical school. Evidence from Wilkinson, Casey and Eley (2014) furthermore suggests that admission is influenced by gender and sociocultural, educational, and family background. Research indicates that the predictive power of pre-admission academic performance

declines as students' progress through their basic and undergraduate training (World Health Organization, 2013). Therefore, selection processes for entry into medical school are constantly under scrutiny, especially for their predictive validity and sensitivity to broadening the admission base (Bore, Munro & Powis, 2009). It has been debated and is generally agreed that becoming a good doctor requires more than knowledge-based academic achievement. Therefore, identifying the desirable personal qualities or competencies of future doctors has become an important concern in medical student selection. Nevertheless, the desirable qualities of the "ideal" doctor have been difficult to define and some literature has indicated that there are diverse views on this matter among scholars (Albanese et al., 2008).

1.5 RESEARCH QUESTIONS

An in-depth analysis of what makes a medical doctor competent, as defined by academics, regulators, and practising professionals, and in relation to what society defines, is an important research discourse of present times. Therefore, the questions to be addressed by this study include the following:

- i. How are AfriMEDS core competencies implemented and assessed in the UFS MBChB curriculum?*
- ii. Are UFS medical interns sufficiently trained and assessed in AfriMEDS core competencies?*
- iii. How can the implementation and assessment of AfriMEDS physician competency framework in an undergraduate medical programme at UFS be evaluated?*
- iv. Is AfriMEDS fit for purpose in producing healthcare professionals that are ready to serve and meet South African society needs?*

To answer these questions, it is important to start with a mapping exercise. In this instance, the process involved the curriculum review of the medical programme by the students, the educators, and the manager(s).

It is the researcher's observation, through engagements with students, educators, and student support services, that the UFS – as the only medical school in South Africa that offers a five-year undergraduate medical programme – predisposes itself to extreme challenges, among which are the following, which have been informally expressed to the researcher by students, educators, and student support staff:

- The faculty psychologist reported to the researcher that the course is congested and regarded as “heavily loaded”;
- There is not enough time to implement the AfriMEDS framework; and
- Through the researcher’s interaction with the faculty psychologist, he learned that students report that the programme causes stress and is difficult to cope with.

Therefore, this study is a critical evaluation and judgement of the successes and the shortcomings of the AfriMEDS physician competencies as adopted and implemented by a five-year medical programme at UFS, given the South African health system context.

1.5.1 Research aim and objectives

The study aimed to evaluate the implementation and assessment of AfriMEDS by medical interns completing either their first or second years of internship (medical residency) in 2020, and who had studied at UFS.

The objectives of the study were as follows:

- i. To evaluate the implementation of the AfriMEDS core competencies in a post-apartheid South African medical school;
- ii. To determine the perceptions of interns on the training and assessment of AfriMEDS core competencies during their MBChB programme;
- iii. To evaluate the implementation and assessment of a five-year medical undergraduate programme.

1.6 VALUE OF THE STUDY

This study focused on the need to implement AfriMEDS in the country – one that includes a community-oriented primary care approach. The value of the study is that it includes education needs assessments, such as practice profiling and task analysis, defines the population’s health needs, and identifies entrustable professional activities for a specialty or subspecialty (Ten Cate, 2005; Ten Cate & Scheele, 2007).

This study could assist with continuous review and improvement of medical school curricula in order to produce competent doctors for the South African health system environment.

1.7 CONCEPTS AND TERMS

This section aims to provide definite meanings for key concepts and terms in medical education as used in this study.

Competency-based medical education: The definition of CBME varies in literature and according to different experts. ICBME collaborators could not reach consensus on a definition of CBME that could establish the definition of health professions education (Diwakar, 2002; Albanese et al., 2008; Frank et al., 2010(a)).

The concept of physician competency is complex, multidimensional, dynamic, and developmental. Because of the complexity of the construct, competency is described as dynamic and contextual (Koens et al., 2005; Frank et al., 2010). For example, a surgeon trained in a high-technology setting might not be able to work in a rural setting, where modern technology is not available. Another example is a physician who had acquired certain skills but does not get sufficient exposure; as a result, the skills previously acquired become dormant. Thus, the concept of competency is progressive, develops over time, and is dynamic and dependent on the contextual aspects and learning or practice environment (Frank et al., 2010(b)).

The concept of competencies as it relates to CBME can be unbundled further into constituent components, as explained in contemporary vocabulary by the ICBME collaborators and illustrated in Table 1.1.

Table 1.1: Proposed definitions of CBME and related terms by the ICBME collaborators

TERM	DEFINITION
Competence	The array of abilities across multiple domains or aspects of physician performance in a certain context. Statements about competence require descriptive qualifiers to define the relevant abilities, context, and stage of training. Competence is multidimensional and dynamic. It changes over time, with experience, and in different settings (Dreyfus, 2004; Carraccio et al., 2008).
Competency	An observable ability of a health professional, which integrates multiple components, such as knowledge, skills, values, and attitudes. Since competencies are observable, they can be measured and assessed to ensure their acquisition. Competencies can be assembled like building blocks to facilitate progressive development (ICBME collaborators, adapted from Frank et al., 2010(b)).
Competency-based medical education	An outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programmes, using an organising framework of competencies (ICBME collaborators, adapted from Frank et

TERM	DEFINITION
	al., 2010(b)).
Competent	Possessing the required abilities in all domains in a certain context at a defined stage of medical education or practice (Ten Cate, 2005; Ten Cate & Scheele, 2007).
Dyscompetence	Possessing relatively little ability in one or more domains of physician competence in a certain context and at a defined stage of medical education or practice (ICBME collaborators, adapted from Frank et al., 2010(b)).
Incompetent	Lacking the required abilities in all domains in a certain context at a defined stage of medical education or practice (ICBME collaborators, adapted from Frank et al., 2010(b)).
Progression of competence	For each aspect or domain of competence, the spectrum of ability from novice to mastery. The goal of medical education is to facilitate the development of a physician to the level of ability required for optimal practice in each domain. At any given point in time and in a given context, an individual physician is to reflect greater or lesser ability in each domain (ICBME collaborators, adapted from Frank et al., 2010(b)).

The current understanding of physician competency is described as the ability to practice independently. The limitation of this definition is that it is time-bound and static, and dependent on certification. The term competent is now used to describe domains of abilities, contextual issues, and stage of medical training that applies in the programme or discipline. In order to apply the AfriMEDS framework, certain milestones need to be attained as part of the entrustable professional activity. The key definitions are defined as follows:

Entrustable professional activity: A key task of a discipline that can be entrusted to an individual who possesses the appropriate level of competence (Frank et al., 2010(b)).

Milestone: The expected ability of a healthcare professional at a stage of expertise.

In summary, a competency-based curriculum, therefore, begins with outcomes in mind, on the basis of which it defines the abilities needed by graduates, and then it develops milestones, instructional methods, and assessment tools to facilitate their acquisition by learners (Frank et al., 2010(b)). In the future, expertise rather than experience is expected to underlie competency-based practice and certification (Aggarwal & Darzi, 2006).

1.8 OUTLINE OF THE STUDY

The thesis comprises seven chapters, which will be structured as follows:

Chapter 1: Orientation to the study

This chapter served as an introduction and provided an orientation to the study. The introduction laid the foundation regarding the way the AfriMEDS competency framework was developed. It introduced concepts of graduate attributes, competencies, and skills which are very important to understand in the context of the study. The introduction of guidelines used to evaluate and assess AfriMEDS was reflected upon and mostly importantly the myriad challenges associated with implementing GAs. The rationale, statement of the research problem, research questions, research aims and objectives, value of the study, concepts and terms, and the applicability of assessment tools were discussed.

Chapter 2: Background and Literature review

The objective of Chapter 2, as a background and literature review, will be to elucidate on the background reflecting on the South African landscape in terms of medical education and health sector reform. Gas and the way the concept evolved internationally, nationally, and institutionally at UFS. The theory of transformative learning, which underpins the thesis, will be discussed. The determination of GAs will be aligned with AfriMEDS competencies, and a discussion of how GAs and AfriMEDS were introduced to inform curricular outcomes will be provided. The context of curriculum analysis in South Africa will be examined in terms of the legislative framework of the HPCSA Act of 56, 1974. Since UFS was the focus of a mixed-methods case study, the curriculum will be discussed and assessed to determine how it is structured and to define what makes a curriculum to be fit for purpose. The overview of seven CanMEDS domains will be elaborated on, and the way it culminates in the AfriMEDS model will be explained, considering South African historical imperatives in relation to medical training.

Chapter 3: Research methodology

Chapter 3 will outline the research paradigm, research design, and research methodology employed in the empirical portion of the study. The theoretical outline will be discussed as part of the transformative paradigm that was used in the study. The research design and methodology will be discussed in terms of selection of participants, data collection, and data analysis. The latter part of the chapter will focus on the integrity of the study, including validity and trustworthiness, as well as ethical considerations and approval processes applied in the study.

Chapter 4: Presentation and analysis of research findings: Document analysis and semi-structured interviews

Chapter 4 will present data obtained during the study from the document analysis and the semi-structured interviews with educators. The data will be analysed using graphs, tables, and figures. Finally, qualitative techniques of data handling and analysis of the results will be presented.

Chapter 5: Online questionnaire of medical interns

Chapter 5 will present data obtained during the study from the online survey administered to interns. The data will be analysed using graphs, tables, and figures. Lastly, quantitative techniques of data handling and analysis of the results will be presented.

Chapter 6: Evaluation of AfriMEDS competency framework

This study culminated in developing a graphical framework, guidelines, and assessment tools to evaluate the implementation of an AfriMEDS physician competency framework and the way an AfriMEDS physician competency framework can be used to embed and evaluate the undergraduate medical curriculum. In this chapter, a draft AfriMEDS framework diagram will be introduced, which can serve to guide how the AfriMEDS context of the CanMEDS framework diagram can be depicted, integrated, and implemented using a graphical representation of GA competency roles in the context of an African community.

Chapter 7: Conclusions and recommendations

Chapter 7 will provide a summary of the research overview and findings. It will conclude by indicating the value of the study as well as its limitations and directions for further research.

1.9 CONCLUDING REMARKS

In South Africa, there is a need to evaluate the implementation and assessment of AfriMEDS physician competency framework and to develop guidelines that will ensure that GAs and competencies are embedded in curricula. Hence, the AfriMEDS framework is key in

determining what is needed to produce a competent healthcare practitioner. Therefore, in the context of South Africa, as part of the international community, and taking the UFS medical school as a mixed-methods case study, it is of paramount importance to establish how the AfriMEDS framework is implemented and assessed in order to achieve the competency of the “desired or aspired” competent medical practitioner, whom members of the public can trust with their lives and safety.

The researcher discussed the evolution of a competency framework in medical education. This competency framework underpins what is now universally accepted as GAs that should guide how community-based medical education is applied internationally, and how it was adopted and adapted to be Afrocentric by the HPCSA and SACoMD.

CHAPTER 2

BACKGROUND AND LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter provided an introduction and background to the study. The aim (*cf.* Section 1.4.1) of this study was to evaluate how AfriMEDS competencies are implemented and assessed in the undergraduate medical programme of the school of medicine at UFS. This chapter will delve deeper into the theoretical and literature review of the CBME.

For any type of study, irrespective of the research paradigm, conducting a literature review is of paramount importance (Mertens, 2010). The purpose of a literature review is to improve understanding of and acquire knowledge about existing research and discourse relevant to a particular area of interest or topic, and to present it in a written report. A literature review helps to generate knowledge regarding the field of interest and helps a researcher to gain a balanced understanding of what is known and not known about a topic.

In this study, the purpose of the literature review was, first, to understand the concept of CBME and its alignment with GAs and the competency framework. This topic was covered in Chapter 1 of this study. Secondly, the study considered the evolution of GAs and the way GAs are structured, embedded, implemented, and assessed, in general, but specifically in medical curricula using the CanMEDS competency framework; this topic will be covered in this chapter.

This chapter will provide an overview of GAs in South Africa and across the globe, and provide a glimpse of how the UFS MBChB programme is structured. Even though the concept of AfriMEDS in South African medical schools is widely accepted at the undergraduate level, medical education has not yet been standardised, and no guidelines exist to ensure uniformity and higher education standards, in contrast to what could be expected of such professional medical programmes.

2.2 BACKGROUND TO THE RESEARCH PROBLEM

There are 10 medical schools in South Africa. The ninth one was only established in 2009 and the tenth one started admitting students in 2021. The remaining eight medical schools

produce an average of 1 500 doctors yearly, according to HPCSA data (2017).

UFS is the only medical school in South Africa that offers a five-year Bachelor of Medicine and Bachelor of Surgery (MBChB) degree, and has done so since 2000. UFS revised its curriculum in 2014 to align it with the AfriMEDS framework that is accredited by the HPCSA. AfriMEDS, as per HPCSA accreditation criteria, should be embedded in the five-year programme of the UFS, which contributes to it being a very intensive programme. It is, therefore, important to determine how UFS implements and assesses AfriMEDS in the context of the socio-political transformations that have taken place in the country. In 2018, UFS embarked on systemic transformation, informed by its strategic plan to develop GAs through curricular and co-curricular interventions, as described in its Strategic Plan 2018-2022 (UFS, 2018). Most South African universities have absorbed the notion of GAs into their strategic planning and have embedded GAs into their curricula.

In countries such as Australia, New Zealand, and the United Kingdom, it is now a commonly accepted marketing strategy for universities to use GAs to justify the value and worth of their institutions in an attempt to attract prospective students (Wong et al., 2021). This is done by showcasing the sets of skills and competencies their graduates would develop throughout their degree programmes.

This study reflects on the post-apartheid period in South Africa, which refers to a democratic dispensation that commenced in 1994. This post-apartheid era in the context of South African medical education will be described in the next sections (2.2.1 & 2.2.2).

2.2.1 South African health sector reform and evolution of medical internship

South Africa's transition to democracy, which commenced in 1994, has included the reform of the healthcare sector and had the aim of making healthcare more accessible, affordable, and equitable. This reform led to the introduction of free healthcare provisioning policies, district health services, and prioritisation of primary healthcare, all of which contribute to ensuring a more equal distribution of healthcare workers and greater access to services (Van Rensburg, 2014). The revitalisation of primary healthcare in South Africa was much needed to improve health outcomes. The National Development Plan that was launched in 2012 is the country's blueprint for sustainable growth until 2030. One of the "critical actions" of the plan is to phase in national health insurance. The national Department of Health's 2017 White Paper envisages that national health insurance could bridge the gap between

the public and private sectors. National health insurance is being phased in over a 14-year period, with the first phase (2012-2017), which focused on public sector strengthening, completed (Republic of South Africa, Department of Health, 2017). The role of doctors in primary healthcare is defined as providing holistic care to patients; contributing to health promotion; providing clinical support and governance; mentoring and supporting other team members; ensuring continuity of care through effective referral; advocating for the community; and improving health outcomes through an understanding of the social determinants of health.

In order to cope with the disease burden of HIV and AIDS, and tuberculosis, a paradigm shift was needed in South African medical education and training to focus more on the community, and disease prevention, and this led to the COPC approach being adopted (Slaven, 2017). South Africa, like many other countries, faces a shortage of medical practitioners due to insufficient production, management, and retention. The distribution of staff between the public and private sectors is also disproportionate due to HIV and AIDS, and tuberculosis and the continuous migration of expertise and skills (George et al., 2012). At the moment, there is a real danger that primary healthcare revitalisation will not be achieved unless the rural-urban and public-private divide among healthcare worker distribution is curbed.

A two-year medical internship was, therefore, introduced in South Africa from 2004. However, Prinsloo (2005) cautions that the two-year medical internship should not be seen as filling the gap regarding capacity in the workforce. Medical internship refers to a period of supervised training for newly qualified doctors at an accredited facility, such as a hospital, clinic, or health centre (HPCSA, 2012). Internship represents a transition period between being a student and becoming a professional. Medical internship should provide opportunities for developing interns' knowledge, skills, appropriate behaviour patterns, and professional thinking further. During this time, interns should gain insight into and understanding and experience of patient care, so that they can function as competent and safe independent medical practitioners (HPCSA, 2012; Sein & Tumbo, 2012).

In South Africa, medical internship was initially introduced in 1950 as a one-year training period during which interns rotated through specialist and subspecialist departments. Lack of practical competency, absence of uniformity in training, and lack of relevance became a serious cause for concern, and modifications were made to internship training early in the new millennium (Meintjes, 2003; Sein & Tumbo, 2012). In 2004, the two-year internship

training programme was introduced, which included four-month rotations in the following key medical domains: general (internal) medicine, general surgery, obstetrics & gynaecology, paediatrics, family medicine & psychiatry, & anaesthesiology & orthopaedics (Meintjes, 2003; Republic of South Africa, 2009). Medical internship training is comprehensive and complementary to the South African healthcare system, and emphasises primary healthcare. On 12 December 1997, the former president, Nelson Mandela, signed into law the Health Professions Amendment Act, which prescribes the implementation of compulsory community service and postgraduate vocational training for medical graduates in South Africa who have completed internship (Reid, 2009). The introduction of compulsory community service for all medical graduates was aimed at strengthening human resources in rural areas and supporting peripheral health services.

Over the last decades, governments around the world have actively sought to address rural health challenges through policy measures; however, workforce shortages have proved to be a critical barrier to sustaining such policy interventions (Zimitat, 2011). As a result, governments have encouraged medical schools to respond to workforce shortages by ensuring a rural component in their operations, thus influencing the typology of medical schools based on their foundation, mission, and rural medical experience in their curriculum (Zimitat, 2011).

The United Nations, through its proposed Sustainable Development Goals, intends to achieve universal health coverage by 2030, including financial risk protection, access to quality essential healthcare services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all (United Nations, n.d.).

Many South Africans are still living in rural areas and in poverty. They lack access to affordable, quality, and comprehensive healthcare, despite significant government investment in programmes to strengthen the healthcare system (Mayosi, Flisher & Lalloo, 2009). Furthermore, the healthcare service delivery model in South Africa is still generally hospital-based, which limits the delivery of comprehensive, integrated primary care through disease prevention and health promotion. District-based primary healthcare implementation was, furthermore, confronted with the emergence of the HIV-AIDS-tuberculosis co-epidemic, as well as a rising burden of chronic non-communicable diseases (Mayosi, Flisher & Lalloo, 2009). The overwhelming burden of disease, coupled with a continuous movement of health professionals to wealthier countries, and from the public sector to the well-resourced private sector, undermined the strength of the public sector to implement

successful health sector reform. Community medical education and training, and clinical service delivery that addresses societal needs, is central to health sector reform in South Africa; hence, an emphasis on communities is integral to the national health insurance.

2.2.2 South African health education transformation

The national health department's Human Resources for Health Strategy (Republic of South Africa, Department of Health, 2011) emphasises the strengthening of mainly the following types of healthcare workers, in line with primary healthcare re-engineering: community health workers, professional nurses, medical practitioners and clinical associates, as well as mid-level workers at the district hospital level. Primary healthcare re-engineering aims to improve community health through three streams: ward-based outreach teams, school health services, and district clinical specialist teams (Republic of South Africa, Department of Health, 2011). District clinical specialist teams were necessitated by high maternal mortality in the country: almost six in every ten maternal deaths were potentially preventable (Republic of South Africa, Department of Health, 2014). Ward-based outreach teams are managed by professional nurses who are also responsible for postnatal and community health worker-referred home visits to patients (Daviaud & Subedar, 2012). The Human Resources for Health Strategy describes other workforce implications of primary healthcare re-engineering, such as the need to re-establish the function of the medical practitioner as a key clinical role player in the primary healthcare team. Unique skills, and not just knowledge, is required to be a key role player capable of leading a multidisciplinary team, hence the need for a paradigm shift in medical education. The training should focus on the holistic competencies needed to lead such a diverse team in a challenging work environment. The AfriMEDS framework was adopted, accepted, and adapted in South Africa by the HPCSA and SACoMD because it suits the African context best. It is summarised in Figure 2.1, which sets out the history of AfriMEDS.

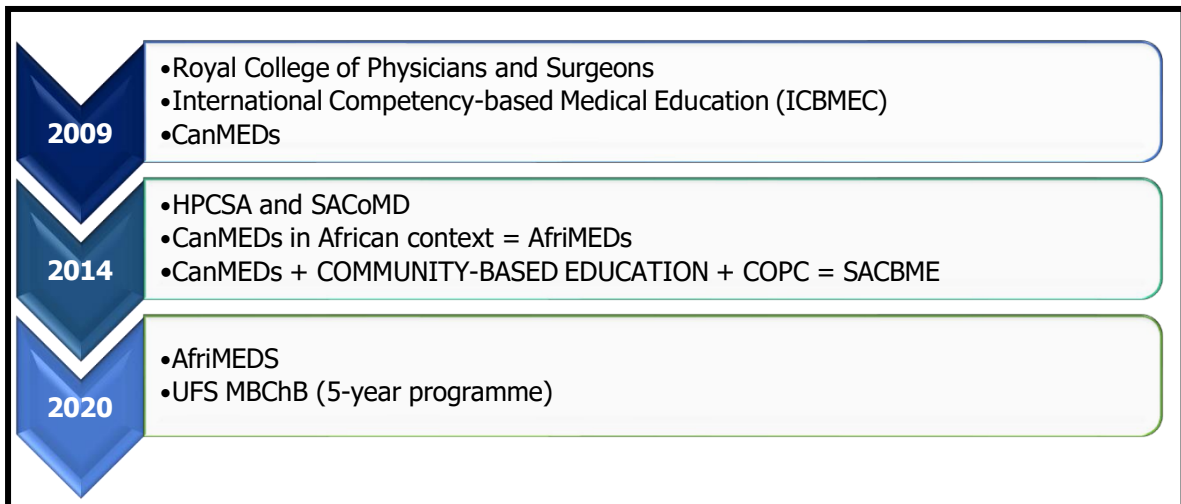


Figure 2.1: Summary of the history of AfriMEDS framework

2.3 THEORETICAL AND CONCEPTUAL FRAMEWORK

This section will focus on the theoretical and conceptual framework.

2.3.1 Introduction

This section will explain the development of a theory-based framework for exploring the ways GAs can be embedded in curricula and in practice. The conceptual framework focuses on the theory of transformative learning. The objective is to understand how this theoretical framework can promote the analysis and understanding of critical features of pedagogy and projects. The results obtained from the application of the framework highlight key elements that enable the successful implementation of GAs in undergraduate curricula by role players in higher education institutions, namely, educators' capacity to foster transformational pedagogies in the classroom, their capacity to strategically plan and implement their change projects, and the wider institutional involvement and administrative context.

2.3.2 Theory of transformative learning

The field of education, especially teaching and learning in the context of higher education, workplace learning, community college education, community development, non-governmental agencies, faculty development, and adult education, has generated much attention, and many variations and applications exist in the theory of transformative learning (Taylor, 2005). This study is underpinned by the theory of transformative learning, in which the evaluation of the UFS undergraduate medical programme can be used to

enhance the transformation of the curriculum. This theory has three paradigmatic underpinnings: constructivism, humanism, and critical social theory. The researcher will not dwell on the underpinnings but will reflect more on the construct of transformative learning as a modality.

The theory of transformative learning uses the following modalities to infuse GAs and competencies in the curriculum: diversity of learning approaches, exploration of issues at multiple scales, case studies, and exploration of the social dimension of learning. In terms of curriculum innovation and material development, the theory of transformative learning focuses on the diversity of learning approaches (Schrage & Lenglet, 2016). By emphasising learning processes and outcomes, the theory of transformative learning reframed the role of education in relation to curriculum transformation in the context of the pluralistic society that people live in, which is characterised by a wide range of values, interests, and actors, along with the complex nature of curriculum transformation issues (Schrage & Lenglet, 2016). The theory of transformative learning emphasises a critical, problem-based, and reflective practice of education (Thomas, 2009) that fosters critically reflective thought, imaginative problem-solving, and discourse that is learner-centred, participatory, and interactive. The theory of transformative learning involves group consultations and group problem-solving (Mezirow, 2000:10). In the theory of transformative learning, curriculum transformation is a "transformative learning that enables alternative and new kinds of thinking and solutions that are 'co-created' [and] co-owned by more reflexive citizens, living in a more reflexive and resilient society" (Wals, 2007:42).

Wals and Corcoran (2006) identify eight modalities that integrate into higher education settings, and foster independent thinking and an inclination toward systemic change in students and educators alike (*cf.* Table 2.1).

Table 2.1: Eight modalities of transformative learning in higher education

MODALITIES	DESCRIPTION	EXAMPLE
1. Total immersion	Fostering a direct experience with a real-world phenomenon.	Observing and monitoring curriculum transformation impacts. Managing a specific issue.
	How is this applicable to this study? (Global, national, institutional; UFS as a case study)	Example in this study: (How a medical undergraduate curriculum has transformed to embed the AfriMEDS framework)
2. Diversity in learning styles	Being sensitive to a variety of learning styles and preferences that can be found in a single group.	Offering a variety of didactic approaches. Reflecting on the learning processes with learners.
	(Educators vs medical interns)	(Feedback from educators and medical interns)
3. Active participation	Developing discourse and ownership by utilising learners' knowledge and ideas.	Soliciting the learners' own ideas, conceptions, and feelings.
	(Medical interns participated in an online survey)	(Medical interns and educators)
4. The value of valuing	Exposing learners to alternative ways of knowing and valuing through self-confrontation.	Giving learners opportunities to express their own values. Creating a safe and open learning environment.
	(Medical interns and educators)	(Medical online survey and feedback)
5. Balancing the far and near	Developing empowerment by showing that remote issues have local expressions that one can influence.	Relating issues of biodiversity or curriculum transformation to last night's dinner.
	(After-care through feedback to participants through workshops, presentations, and publications)	(To educators, faculty managers, and institutional senior management team)
6. A case study approach (of which the UFS is an example)	Digging for meaning by studying an issue in depth and looking for transferability to other areas.	Assigning different people to explore different angles of a particular theme and bringing the different angles together.
	(Mixed-method case design and triangulation of data)	(Quantitative and qualitative research methodology)
7. Social dimension of learning	Mirroring learners' ideas, experiences and feelings with those of others through social interaction.	Taking time for discussions and exchange. Addressing controversy. Stimulating flexibility and open-mindedness.
	(Mixed-method design and after-care)	(After-care)
8. Learning for action	Making the development of action and action competences an integral part of the learning process.	Allowing learners to develop their own course of action and to follow through with it. Studying examples of action-taking elsewhere.
	(How AfriMEDS GAs and competencies are infused as part of teaching and learning)	(Medical interns' feedback on improvement and follow-through)

Source: Wals and Corcoran, 2006, adapted by Schrage and Lenglet, 2016

In this study, the conceptual framework of the theory of transformative learning, through the eight modalities set out in Table 2.1, provides a synthesis of literature on how the theory of transformative learning and modalities are conceptualised to explain the phenomenon of GAs and competency. It empowers the researcher's understanding of how the different variables of the study interconnect; it outlines the actions required, thus drawing up the implementation plan for the course of study.

2.4 CONTEXT AND GLOBAL PERSPECTIVES ON GRADUATE ATTRIBUTES

Section 2.4 will reflect on how GAs have evolved and are being implemented around the geopolitical globe.

2.4.1 Historical perspectives and training capacity of South African medical schools

In South Africa, with its past characterised by apartheid, three of the country's nine medical schools were set up to train black medical students. Sefako Makgatho University (formerly Medunsa) and Walter Sisulu University (formerly Unitra) are institutions that almost exclusively trained black African students, while the University of KwaZulu-Natal served both Indian and black African students. White universities were categorised according to language of instruction, namely, the Universities of Cape Town and Witwatersrand were mainly English institutions, and the Universities of the Free State, Pretoria, and Stellenbosch were predominantly Afrikaans. Historically, white medical schools admitted few, if any, African students until about 22 years ago. Since the dawn of democracy in South Africa in 1994, all medical schools have put in place student selection methods and academic support mechanisms aimed at promoting access for students from historically disadvantaged educational backgrounds to address the inequities of the past. In addition, health science education has been under pressure to change its focus and to adapt to national and international developments that favour a focus on community-oriented primary healthcare (Bam et al., 2013). This process, in the South African context, has been associated with transformation.

UFS was founded in 1904 and is one of South Africa's oldest institutions of higher learning. In the apartheid era, this university accommodated only white students, and Afrikaans was the sole medium of instruction. In 1993, UFS adopted a new parallel-medium language policy (Afrikaans & English), which led to a major increase in the enrolment of black

students (Suransky & Van der Merwe, 2016). Prior to 1994, the medical school at UFS was mainly only accessible to white Afrikaans-speaking students.

With the dawn of South Africa's democracy in 1994, UFS was obliged to open its doors to coloured and black students. Despite greater access for these race groups, the parallel-medium language policy of the university did not promote social integration of different race groups – there was no significant, direct interracial contact or integration on campus, since the majority of white students attended lectures offered in Afrikaans, and black students those offered in English. However, it was expected of students from different race groups who lived in the campus-based student residences to be integrated. This campus-based student integration process led to violence between black and white students, and the university adopting a hostel placement policy based on voluntary association. However, this approach soon resulted in the recreation of monoracial residences. The new placement policy, together with the parallel-medium language policy, divided the student population along racial lines, as the rector acknowledged in 2005: "on the main campus in effect we have two campuses – one white and one black, separated in the classrooms and in the residences" (Fourie, 2005:6). This separation of white and black students in residences and in classes culminated in race-based conflict in 2006, which led to the shutdown of UFS. White male students who resisted mixed-race residences were then accommodated in one residence, Reitz, which became a symbol of white Afrikaner male resistance and the power to resist transformation and the new democratic dispensation in South Africa.

In August 2007, four white Afrikaner residents of Reitz prepared a video clip for the cultural evening of their university residence, where first-year students were undergoing an initiation process. The initiation involved seniors urinating in the food of the first-year students and making them drink revolting concoctions till they vomited. Even though the initiation was humiliating, it was the residence tradition. In February of 2008, the video clip came into the public domain. It showed the students forcing a group of elderly black workers (cleaners), four women and one man, to eat food into which one of the students had apparently urinated (Suransky & Van der Merwe, 2016). Predictably, the incident was met with public outrage and necessitated the intervention by the South African Minister of Education. In March 2008, only a few days after the video became public, the minister announced the establishment of a Ministerial Committee on Progress towards Transformation and Social Cohesion and the Elimination of Discrimination in Public Higher Education Institutions as a way to investigate discrimination and, particularly, racism in South African public higher education (Suransky & Van der Merwe, 2016). This is the

context in which the Reitz incident happened, and this history is significant for understanding the historical context of the UFS medical school as a mixed-methods case study.

In 2003, the HPCSA introduced a two-year internship (medical residency) – the internship had been one year in duration up to this time. This extension of training time prompted the majority of medical schools to adopt a five-year medical curriculum. The six-year curriculum was phased out in parallel with the introduction of the five-year medical programme. However, after 2010, most of the medical schools reverted to a six-year programme, as they were expected to make curriculum changes related to CBME to address the health challenges the country was facing. UFS is the only medical school that did not revert to the six-year programme, as it was convinced that it could deliver on all the expectations of CBME and community-based education within five years. The HPCSA supported the venture.

After extensive review, the UFS language policy was radically changed in 2016 to using English as the only medium of instruction while promoting multiculturalism and diversity, and supporting the use of Afrikaans, Sesotho, and isiZulu in tutorials, where it was culturally convenient and permissible (UFS, 2016). In 2017, the admission policy of the UFS School of Clinical Medicine was also adapted to align with the demographic profile of the country, in general, and the Free State, in particular. This meant African students constituted over 70% of admissions to the medical school.

It remains to be critically evaluated whether, indeed, a comprehensive AfriMEDS is delivered equally well by a five-year programme as by a six-year programme. This is one of the reasons why UFS was an appropriate milieu for this study.

2.4.2 Perspectives on graduate attributes

GAs or qualities of graduates are not new concepts and date back to 1862, to the University of Sydney's first statement of generic attributes, the archives of American universities (Yale 1828 statement), and to several British universities (Barrie, 2005). It is important to obtain a global and South African perspective on how GAs are perceived.

2.4.2.1 *Global perspectives on graduate attributes*

Despite the increasing popularity of GAs and their use as agents for commodification by

universities to market themselves to prospective students, it remains a question today, however, whether institutions of higher learning actually fulfil these expectations. There have been surveys to determine this by employers in Australia (DETYA, 2000), and two national reports (Hager, Holland & Beckett, 2002; Bowden et al., 2000) identified a need for significant curriculum reform by universities to fulfil their claim of instilling generic GAs. In the United Kingdom, efforts to develop generic skills have been funded by government; however, despite these efforts, Drummond, Nixon and Wiltshire (1998:23) reached the following conclusion:

The overall picture of personal and transferable skills in the UK higher education sector is not very encouraging. Certainly, there is little evidence of effective practice on any large scale. There is however considerable evidence to suggest that, sometimes major development programmes have had only limited success.

The absence of a coherent theoretical model to support the generic skills agenda has been a subject of controversy among authors for many years (Bennett, Dunne & Carre, 1999). This controversy is evidenced by the variety of terms used interchangeably to describe generic outcomes (Barrie, 2005) and questions such as, Are skills the same as qualities? Are competencies the same as capabilities? and What is the basis for assuming these outcomes are generic or transferable (Barrie, 2005)?

Because of the complexity of describing generic skills and apparent lack of agreement among academics on the concept of generic attributes, universities adopted different approaches, ranging from teacher-focused approaches to learner-focused approaches, which resulted in achieving learning outcomes of a range of quality (Barrie, 2003).

Based on these findings, the University of Sydney formulated a two-tiered policy statement for GAs. The first tier refers to the attributes of scholarship, global citizenship, and lifelong learning. These attributes are described as attitudes needed for a graduate to be successful in a postmodern world (Barnett, 2004). The second tier comprises a cluster of attributes, identified as (1) Research and inquiry, (2) Information literacy, (3) Personal and intellectual autonomy, (4) Ethical, social, and professional understanding, and (5) Communication (Barrie, 2005). The second tier is the one that is widely accepted by the University of Sydney because it provides a common framework that has been accepted by most disciplines.

In countries such as New Zealand, Australia, and the United Kingdom, more universities are transitioning towards evaluating the quality of education they provide in terms of skills,

knowledge, and attributes that their graduates acquire after graduating and how this leads to employability in a rapidly changing world, which requires attributes that extend beyond disciplinary knowledge (Barrie, 2007; Griesel & Parker, 2009; De la Harpe & David, 2012; Coetzee, 2014). These qualities differ from one institution to another institution and are different for each student, as they develop in unique ways, given students' different backgrounds and their institutional and personal learning experiences.

The findings of the Higher Education South Africa study (Griesel & Parker, 2009), which will be discussed in Section 2.3.2.2, highlight how employers and universities need to work together closely to close gaps between acquired skills, knowledge and attributes, and applicability in the work environment, so that there is better understanding, role clarification, and respect for each other's roles.

2.4.2.2 South African perspectives on graduate attributes

In South Africa, a baseline study by Griesel and Parker (2009) was undertaken by Higher Education South Africa, the leadership organisation of the 23 public higher education institutions in South Africa. The purpose of the Higher Education South Africa 2008 pilot survey was to investigate the views and expectations of employers and their evaluation of the quality of graduates produced by South Africa's higher education institutions (Griesel & Parker, 2009). It was envisaged that the outcomes of the study would provide useful data to inform debate and engagement with industry and, furthermore, to establish an empirical benchmark against which to conduct periodic future reviews. Two central assumptions were considered in the study (Griesel & Parker, 2009:3):

- i. that the knowledge, skills, competencies and values of new graduates (the combined "graduate attributes" that are a necessary pre-condition for a graduate to have achieved "employability") may be out of sync with the needs and expectations of employers; and*
- ii. that the notion of skills may need to be redefined within the context of changing graduates from the perspective of employers.*

Four framing categories of attributes were utilised in the Higher Education South Africa study, namely:

- i. Basic skills and understanding: Do graduates display the necessary "know-how" to meet workplace expectations (i.e., can they "hit the ground running")?
- ii. Knowledge and intellectual ability: Do graduates display intellectual ability and sufficient conceptual depth to perform well?

- iii. Workplace skills and applied knowledge: Do graduates demonstrate an appropriate approach and applied competence to workplace tasks?
- iv. Interactive and personal skills: Do graduates have a sense of self in relation to (changing) workplace contexts and practices?

The summary of the study by Griesel and Parker (2009) reveals the following findings:

- The analysis behind the study's findings suggests that employers have a much more complex view of the role of higher education than higher education itself may give employers credit for; in different terms, employers and higher education may be misunderstanding each other's positions.
- There is a real need to address gaps between employer expectations and higher education outcomes.
- Employers value the conceptual foundation, knowledge, and intellectual approach to tasks of higher education.
- There may be a greater common language between higher education and employers than is commonly recognised.
- A degree of realism will need to be sustained on both sides about how far higher education can be expected to "bridge the gap" and the role that only employers can play in providing on-the-job learning and continuing development.

It is important to have a global perspective about how the GAs evolved and how the gap between higher education and the world of work was approximated.

2.4.2.3 UFS perspectives on graduate attributes and strategic implementation

In the first place, to close this gap, the UFS, in its *Strategic Plan 2018-2022* (UFS, 2018), revised and developed its GAs so that they enable graduates to compete globally and locally while enhancing academic quality. In 2016, the World Economic Forum proposed the 21st-century skills gap (Soffel, 2016). These 21st-century skills gaps were later adopted by UFS in their 2018 Strategic Plan. The eight GAs are underpinned by literacy, numeracy, scientific literacy, ICT literacy, financial literacy, and cultural and civic literacy. These attributes are defined as follows in the UFS Strategic Plan (2018:4-6):

Academic competence: Academic competence refers to the knowledge, skills, and attitudes that students develop through their interaction with discipline-specific content. Critical to

academic competence is lifelong learning, which is an all-purpose learning activity that is undertaken continuously, with the aim of improving knowledge, skills, and competence. Lifelong learners are curious, take the initiative, learn independently, transfer knowledge, and reflect on their learning.

Critical thinking: Critical thinking is a habit of mind characterised by a comprehensive exploration of issues, ideas, artefacts, and events, before accepting or formulating an opinion or conclusion.

Problem-solving: Problem-solving is the process of designing, evaluating, and implementing a strategy to answer an open-ended question or achieve a desired goal.

Oral communication: Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviours.

Written communication: Written communication is the development and expression of ideas in writing, which involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences throughout the curriculum.

Community-Based Education: Community-Based Education refers to working to make a difference in the community life of a community and developing a combination of knowledge, skills, values, and motivation needed to make that difference. It means promoting the quality of life in a community through both political and non-political processes. In addition, community-based education encompasses actions wherein individuals participate in activities of personal and public concern that are both individually life-enriching and socially beneficial to the community. Finally, community-based education includes an understanding of the social and cultural diversity in a country, whereby students' value and respect different cultures and are able to analyse and solve problems with people from different backgrounds and cultures.

Ethical reasoning: Ethical reasoning is reasoning about right and wrong human conduct. It requires students to be able to assess their own ethical values and the social context of problems, recognise ethical issues in a variety of settings, think about how different ethical perspectives might be applied to ethical dilemmas, and consider the ramifications of

alternative actions. Students' ethical self-identity evolves as they practise their ethical decision-making skills and learn how to describe and analyse positions on ethical issues.

Entrepreneurship and employability: Entrepreneurship refers to the actions of someone in reaction to opportunities and ideas, and transforming them into value for others. The value that is created can be financial, cultural, or social. This definition focuses on value creation, regardless of the type of value or context – it covers value creation in any domain and possible value chain; it refers to value creation in the private, public, and third sectors, and any hybrid combination of the three. It thus embraces different types of entrepreneurship, including intrapreneurship, social entrepreneurship, green entrepreneurship, and digital entrepreneurship. Entrepreneurship as a competence applies to all spheres of life. It enables citizens to nurture their personal development, to actively contribute to social development, to enter the job market as employees or as self-employed, and to start up or scale up ventures that may have cultural, social, or commercial motives. In turn, employability is a set of achievements – skills, understandings, and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefit themselves, the workforce, the community, and the economy (Association of American Colleges & Universities, 2015; Bacigalupo et al., 2016; Yorke, 2006; UFS, 2018:4-6).

UFS, in implementing the GAs it had identified as part of the *Strategic Plan 2018-2022*, identified six critical factors for success (UFS, 2018:11), namely,

- i. *The successful development of graduate attributes requires that it has to be endorsed by the applicable governance structures. It has to be driven and championed by top and middle management through promotion and performance management practices, facilitated by academic staff, and complemented by support staff.*
- ii. *The creation of a Graduate Attribute and Skills Development Forum (GASDF) to establish a network or community of practice is essential to minimise duplication and maximise alignment of skills development and graduate attribute development initiatives without investing large amounts of resources in one large, complicated initiative.*
- iii. *Financial and human resources need to be deployed where it will make the biggest difference to the development of graduate attributes.*
- iv. *Quality graduate attributes will result from the alignment of policies, programmes and practices throughout the institution. The proposed curricular and co-curricular mapping exercise is therefore critical to create a sustainable approach to graduate attribute development.*
- v. *Publications and research efforts need to be complemented by thorough staff training and development as well as professional development opportunities for staff.*
- vi. *Academic excellence, diversity, transformation, inclusivity and innovation need to be featured throughout the graduate attribute development process.*

2.5 CONSENSUS ON GRADUATE ATTRIBUTES AND COMPETENCY

Although scholars, over the last decade, have had some congruency concerning generic GAs, the concept in medical education is a new one and is much more specific, complex, and dynamic. For some time, though, competency frameworks have intrigued the medical education community, due to their shift from a predominantly time-based approach to one that “requires documentation of proficiency” (Aggarwal & Darzi, 2006:2695), as illustrated by the current preoccupation of the medical education community with the CBME framework. This competency framework is demonstrated by presentations at leading international conferences (Frank et al., 2008; Thompson et al., 2009; Frank & Snell, 2010(b)); innovative pilot projects (Kraemer, 2010); and a sizeable number of key publications in medical education journals (Harden, 1999; Long, 2000; Carraccio et al., 2002; Albanese et al., 2008). CBME has become a popular keyword in medical education and is hotly debated in top general medical journals (Leung, 2002; Aggarwal & Darzi, 2006; Frank et al., 2010(b)).

Competencies have become the focus of the medical education planning of many administrations (Leung, 2002; Albanese et al., 2008). Competency frameworks, such as CanMEDS (Frank, 2005; Frank & Danoff, 2007), the Outcome Project of the United States Accreditation Council for Graduate Medical Education (Edgar & Hamstra, 2015), and the Scottish Doctor (Simpson et al., 2002), now represent the standard of training for the majority of medical learners in the Western world – at least for the purpose of accreditation. However, vigorous arguments persist. The justification, definition, components, advantages and disadvantages, and implications of CBME are all still being fiercely contested (Leung, 2002). In an attempt to lead the profession through CBME discussions, the Royal College of Physicians and Surgeons of Canada convened an international “theory to practice consensus conference” in 2009. Participants in this process formed the International CBME collaborators group to work in partnership on key themes. This study will comment on the initial consensus findings of the ICBME collaborators.

In 2009, the Council of the Royal College adopted a declaration mandating the Office of Education to advance the CBME agenda for specialty education in Canada:

The Royal College in collaboration with key partners, [will] explore opportunities for incorporating competency-based education in residency training and across the spectrum of medical education. This would ensure that the 21st-century PGME [undergraduate medical education] system is focused squarely on meeting societal needs as the primary goal of training. Implementing any such change would conceivably take many years and require a coordinated, resourced, collaborative approach.

Part of the group's pioneering work involved a systematic review of the literature (Frank et al., 2010(b)), which identified authors from various countries who have published on CBME in leading journals (Frank et al., 2010(b)). Authors of papers that defined and elaborated contemporary concepts of CBME were invited to join in a multi-stage group process to advance work in this area (Frank et al., 2010(b)). Furthermore, in addition to conducting the systematic review, the collaborators submitted written statements on various aspects of CBME, participated in teleconferences, attended a three-day summit in Ottawa, Canada, and contributed to international thematic writing groups to articulate the consensus findings (Frank et al., 2010(b)). The collaborators identified several key topics for contemporary educators to consider, among which are the origins of CBME, the rationale for CBME, key definitions related to CBME, the elements of planning CBME, and practical implications of the CBME approach across the continuum of medical education (Frank et al., 2010(b)).

2.5.1 Origins of competency-based education

The competency-based approach to professional training dates back to more than 60 years ago (Spady, 1977; Grant, 1979; Carraccio et al., 2002; Frank et al., 2010(b)). Competency-based education curricula have been used for multiple professions, including chiropractic (Wangler, 2009), social work (Menefee & Thompson, 1994), teacher education (Houston, 1973), pharmacology (Marshall, Adams & Janich, 1997), and others (Pruitt and Epping-Jordan, 2005; Du Toit et al., 2010). In the field of medicine, CBME has been suggested for use for over 50 years (McGaghie et al., 1978) but has only recently been implemented (Leung, 2002; Frank et al., 2010(b)).

2.5.2 The rationale for competency-based medical education

The conceptual framework for evaluating the implementation of CBME programmes was developed by ICBME collaborators (Van Melle et al., 2019). The conceptual framework outlines why the core components should work according to theories, models, or best practices (Van Melle et al., 2019). The five core components were identified for preparing physicians for practice that is "*fundamentally orientated to graduate outcome abilities and organised around competencies derived from an analysis of societal and patient needs*"

(Frank et al., 2010(a):636). These five competencies are illustrated in Figure 2.2, a diagram that is derived from a Delphi study to produce a framework for evaluating the implementation of CBME programmes, 2015-2016.

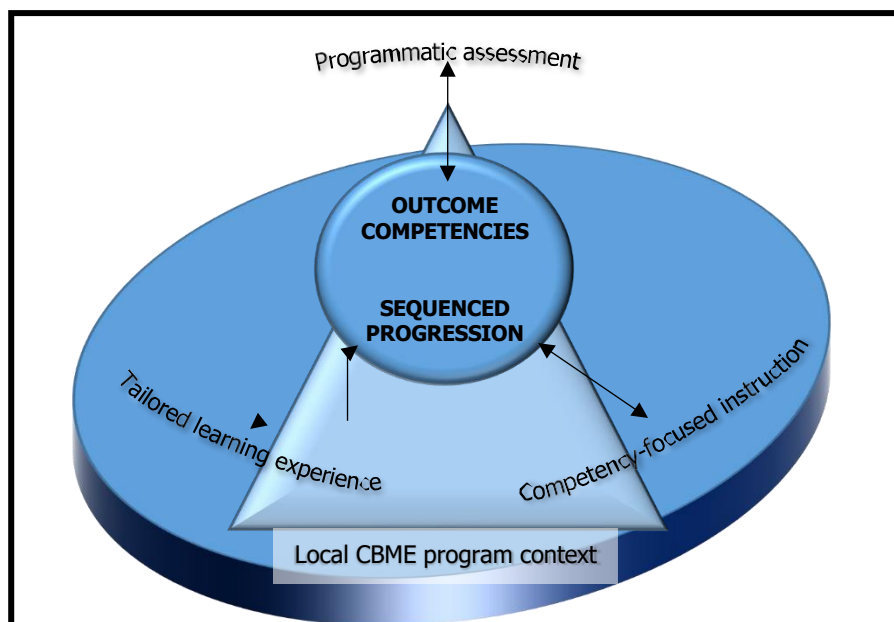


Figure 2.2: Constructive alignment of curricular elements into a balanced ecosystem, as required for CBME

Source: AAMC, 2016

The driving force of the introduction of CBME comprises four key themes, namely, a focus on outcomes, an emphasis on abilities, a de-emphasis on time-based training, and the promotion of learner-centredness (Frank et al., 2010(b)). These themes are presented in Table 2.2 which is adapted from Frank et al. (2010(b)).

Table 2.2: The rationale for CBME

MAIN PRINCIPLE	ELABORATION
<p><i>Focusing on outcomes</i> In an era of greater public accountability, medical curricula must ensure that all graduates are competent in all essential domains.</p>	<ul style="list-style-type: none"> • Not all current curricula explicitly define desired outcomes. • Not all current curricula address all the desired outcomes. • Not all current curricula assess or ensure that graduates have acquired all the necessary abilities. • In the health professions, assessment scores should not be compensatory from one domain to another (i.e., excellent knowledge does not compensate for poor communication skills). • Medical education needs to be transparent for learners, teachers, and the public with respect to its goals and effectiveness. • Standards must be criterion-oriented. • Medical education tends to emphasise process issues (e.g., instructional methods) over outcomes (e.g., graduate performance and satisfaction). • Medical education must prepare trainees for practice. • Content that does not contribute to preparation for practice should be dropped.
<p><i>Emphasising abilities</i> Medical curricula must emphasise the abilities to be acquired.</p>	<ul style="list-style-type: none"> • There is too much emphasis on knowledge and not enough on skills, attitudes, and their synthesis into observable competencies. • An emphasis on the abilities of learners should be derived from the needs of those served by graduates (i.e., societal needs). • Educational objectives as an organising framework should be replaced by a hierarchy of competencies.
<p><i>De-emphasising time-based training</i> Medical education can shift from a focus on the time a learner spends on an educational unit to a focus on the learning actually attained.</p>	<ul style="list-style-type: none"> • Time is a resource to be tailored to the needs of teachers and learners. • Current curricula and credentialing tend to emphasise fixed time spent in training. • Learners may progress at different rates and may achieve threshold competencies faster or slower than the average peer. • Greater emphasis should be placed on the developmental progression of abilities and on measures of performance. • Greater flexibility may make some curricula more efficient and engaging.
<p><i>Promoting greater learner-centredness</i> Medical education can promote greater learner engagement in training.</p>	<ul style="list-style-type: none"> • A curriculum of competencies provides clear goals for learners. • A roadmap of milestones provides a transparent path to achieve the competencies. • An individual learner can adjust their own learning using the milestones.

2.5.3 Overview of the seven competency domains

The generic expected competencies of doctors are listed in Table 2.3. These competencies are informed by the CanMEDS and the community orientation curricula of UFS.

Table 2.3: Definition of competencies and description of key competencies

ROLE	DEFINITION	KEY COMPETENCIES
Medical expert	As medical experts, physicians integrate all the CanMEDS roles, apply medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centred care. Medical expert is the central physician role in the CanMEDS framework and defines the physician's clinical scope of practice.	<ul style="list-style-type: none"> • Practice medicine within their defined scope of practice and expertise • Perform patient-centred clinical assessment and establish management plans appropriate for their speciality • Plan and perform procedures and interventions for the purpose of assessment and/or management • Establish plans for ongoing care and, when appropriate, timely consultation • Actively participate, as an individual and as a member of a team providing care, in the continuous improvement of healthcare quality and patient safety
Communicator	As communicators, physicians form relationships with patients and their families that facilitate the gathering and sharing of essential information for effective healthcare.	<ul style="list-style-type: none"> • Establish professional therapeutic relationships with patients and their families • Elicit and synthesise accurate and relevant information, incorporating the perspectives of patients and their families • Share healthcare information and plans with patients and their families • Engage patients and their families in developing plans that reflect patients' healthcare needs and goals • Document and share written and electronic information about the medical encounter to optimise clinical decision-making, patient safety, confidentiality, and privacy
Collaborator	As collaborators, physicians work effectively with other healthcare professionals to provide safe, high-quality, patient-centred care.	<ul style="list-style-type: none"> • Work effectively with physicians and other colleagues in the healthcare professions • Work with physicians and other colleagues in the healthcare professions to prevent misunderstandings, manage differences, and resolve conflicts • Effectively and safely transfer care to another healthcare professional
Leader and manager	As leaders and managers, physicians are integral participants in healthcare organisations; they organise sustainable practices, make decisions about allocating resources, and contribute to the effectiveness of the healthcare system.	<ul style="list-style-type: none"> • Contribute to the improvement of healthcare delivery in teams, organisations, and systems • Engage in the stewardship of healthcare resources • Demonstrate leadership in professional practice • Manage medical doctor's own practices and careers
Health advocate	As health advocates, physicians contribute their expertise and influence as they work with communities or patient populations to improve health. They work with those they serve to determine and	<ul style="list-style-type: none"> • Respond to the individual patients' health needs by advocating with patients within and beyond the clinical environment • Respond to the needs of communities or the patient populations they serve by advocating with them for system-level change

ROLE	DEFINITION	KEY COMPETENCIES
	understand needs, speak on behalf of others when required, and support the mobilisation of resources to effect change.	
Scholar	As scholars, physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and by teaching others, evaluating evidence, and contributing to scholarship.	<ul style="list-style-type: none"> • Engage in the continuous enhancement of their professional activities through ongoing learning • Facilitate the learning of students, the public, and other healthcare professionals • Integrate the best available evidence, contextualised to specific situations, into real-time decision-making • Critically evaluate the integrity, reliability, and applicability of health-related research and literature • Contribute to the dissemination and/or creation of knowledge and practices applicable to health
Professional	As professionals, physicians are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.	<ul style="list-style-type: none"> • Demonstrate a commitment to patients by applying best practices and adhering to high ethical standards • Demonstrate a commitment to society by recognising and responding to the social contract in healthcare • Demonstrate a commitment to the profession by adhering to standards and participating in physician-led regulation • Demonstrate a commitment to physician health and well-being to foster optimal patient care
CBME	CBME refers to medical education that situates the learner's clinical training in a community setting. It exposes students to patients who are managing their illnesses within their own family, social, and community contexts (Kelly, Walters and Rosenthal, 2014).	<ul style="list-style-type: none"> • Can follow patients over time so that patients can experience continuity of caring • Demonstrate critical clinical reasoning, communication skills, and clinical relationship with patients, which facilitates the continuum of care and disease investigation and progression – ease of access to patients (Kelly et al., 2014)
Community-based education	Community-based education is continuous negotiated collaboration and partnerships between the training institution (UFS) and/or its members and the interest groups that it interacts with, aimed at building and exchanging the knowledge, skills, expertise, and resources required to develop and	<ul style="list-style-type: none"> • Takes informed and responsible action, in line with one's sense of personal and social responsibility, to address ethical, social, and environmental challenges in systems, and evaluates the local and broader consequences of individual and collective interventions • Interprets experience(s) from the perspectives of own and diverse worldviews and demonstrates the ability to act in a supportive manner that recognises the feelings of diverse groups • Connects and extends knowledge (facts,

ROLE	DEFINITION	KEY COMPETENCIES
	sustain society (AACU, 2015).	<p>theories, etc.) from one's own academic study/field/discipline to community-based education and to one's own participation in community-based education efforts</p> <ul style="list-style-type: none"> • Adapts and applies a deep understanding of multiple worldviews, experiences, and power structures while initiating meaningful interaction with others to address significant problems • Articulates a complex understanding of differences in forms of communication and is able to skillfully and collaboratively negotiate a shared understanding based on those differences

Sources: Generic CanMEDS competencies and information adapted from Royal College of Physicians and Surgeons of Canada, 2014

UFS adopted and adapted the community-based education roles, definitions, competencies, and rubrics as developed by the Association of American Colleges and Universities (AACU). The broader principles of AACU Community-Based Education are relevant to the HPCSA guidelines and AfriMEDS criteria. In implementing the CanMEDS domains, the following matters should be taken into account:

- The CanMEDS competency framework was adapted to the individual training programme (MBChB) and discipline, and the necessity to include COPC of the AfriMEDS is acknowledged;
- The AfriMEDS framework has to be audited and carefully structured to avoid duplication of the existing programme;
- Gaps in the existing curriculum need to be identified and revised;
- Educationists may be consulted for advice;
- As it is a team effort, it is important to engage champions for each role;
- The medical programme needs to be evaluated constantly to ensure periodic accreditation; and
- The South African medical curriculum can embed and evaluate the AfriMEDS framework using the diagram in Figure 6.2.

In conclusion, CanMEDS provides a blueprint on which educators can build comprehensive training programmes that can be incorporated into the AfriMEDS to produce health practitioners who are ready to meet the needs of society.

2.6 CURRICULUM DEVELOPMENT AND FITNESS FOR PURPOSE

Defining fitness for purpose in medical education and training will assist medical schools, clinical departments, curriculum designers, medical educators, and regulators to produce medical students that are competent and safe, without any deficiencies and thus able to perform all their required roles. If CBME models such as the AfriMEDS physician competency framework endeavour to produce quality, competent, and safe doctors, the fundamental question is how this drives curriculum development that is fit for purpose and relevant in the African context.

Considering what has been elaborated on in 2.4 and in 2.5.2, fitness for purpose will need to be defined.

"Fitness for purpose is a functional definition of quality, the essence of which is the notion of contributing to the achievement of the purposes of the assessment programme. Fitness for purpose is thus an inclusive notion of quality, encompassing other quality definitions (e.g. zero defects) which are interpreted as purpose" (Harvey & Green, 1993).

Assessment (of clinical competence and training) programme should fulfil the following three criteria in order to effect curriculum transformation or development (Van der Vleuten et al., 2012):

- i. "a programme that maximally facilitates learning (assessment for learning);
- ii. "a programme that maximises the robustness of high-stake decisions (on promotion/selection of learners);
- iii. "a programme that provides information for improving instruction and the curriculum".

In order to protect both public and medical doctors, further exploration into fitness for purpose in medical education and training of future doctors should be contemplated. Once fitness for purpose is attained by every graduate, it is only then at that point that it can be said that the goal and potential have been achieved.

2.7 A FOCUS ON CURRICULAR OUTCOMES

Medical educators argue that curricula should focus on skills needed to serve the public rather than pure knowledge of content that cannot be translated into practice. It is the application of knowledge, rather than pure knowledge alone, that should drive learning and

assessment. The curriculum should be explicitly clear on the skills to be acquired; furthermore, how those skills are taught and assessed is crucial.

The set of skills required should be acquired in totality, without one compensating for another. In other words, for example, the procedural skill should not be used to compensate for lack of communication skills – this approach will ensure that a medical student is endowed with all the necessary skills required to define competency (Frank et al., 2010(b)).

2.7.1 An emphasis on abilities (competencies as the organising principle of curricula)

In this case, the argument is that knowledge objectives should not be pursued at the expense of skills, attitudes, and necessary experience in clinical practice. The CBME framework should be used to organise curriculum, leading design and the learning experience needed to produce observable abilities (Frank et al., 2010(b)).

2.7.2 A de-emphasis on time-based training

The criticism is that medical curricula typically emphasise time spent rather than abilities acquired (Long, 2000). For example, time spent in rotation is used as a criterion for learning. Instead, the emphasis should be on the flexibility of time to acquire skills, as the tempo at which learners acquire skills differs among individuals and over time. Thus, creating flexibility for the time in which learners are to attain skills is seen to be much more effective than a time-based curriculum (Long, 2000; Carraccio et al., 2002; Frank et al., 2010(b)).

2.7.3 Promoting learner-centredness

This principle, which is closely linked to a lesser emphasis on time-based training, argues that the curriculum should provide a roadmap with clear milestones to be attained within a flexible timeframe. This approach creates a learning environment in which learners take charge of their personal development (Carraccio et al., 2002; Frank et al., 2010(b)).

2.8 PLANNING A COMPETENCY-BASED MEDICAL EDUCATION CURRICULUM

Beginning with the end in mind is the key to planning for a CBME curriculum. The needs assessment of graduate competencies is pivotal for identifying the abilities that all graduates

should possess for them to be classified as competent (Frank & Sherbino, 2011). The following steps have been identified for planning a CBME curriculum (Frank et al., 2010(b)):

- Identify the abilities needed by graduates;
- Explicitly define the required competencies and their components;
- Define milestones along a development path for the competencies;
- Select educational activities, experiences, and instructional methods;
- Select assessment tools to measure progress along the milestones; and
- Design an outcomes-based evaluation of the programme.

Thus, the ultimate goal of curriculum planning is to produce competent physicians whom society (the community) can trust to address their needs and challenges.

2.9 SOUTH AFRICAN MEDICAL CURRICULUM ANALYSIS

The HPCSA Act of 56, 1974, defines the undergraduate curriculum and gives a profile of graduates in medicine. For the purpose of this study, the HPCSA Act of 56, 1974, is aligned with CanMEDS physician core competency roles (GAs), alongside the principles of community-based education, COPC as enshrined in AfriMEDS, as follows:

- (1) **The curriculum of a student in medicine shall provide for –**
- (a) *academic learning;*
 - (b) *training and development of skills; and*
 - (c) *development of a student's professional attitudes and conduct.*
- (2) **On the successful completion of the curriculum** referred to in subregulation (1), such student should have developed into a basic medical practitioner under supervision in an approved internship programme, and should have the foundations for further specialist education and training.
- (3) **An approved educational institution shall create a curriculum which must achieve the following:**
- (a) *conveying knowledge, skills, attitudes and appropriate modes of professional conduct to a student in medicine [CanMEDS role of professional and communicator];*
 - (b) *preparing a student for health promotion, the prevention or treatment of illness and rehabilitation of impairment [CanMEDS role of health advocate, collaborator];*
 - (c) *developing research and management abilities and stimulating a preparedness for continuous professional development [CanMEDS role of leader and manager and scholar];*
 - (d) *ensuring relevance to local health needs while satisfying international standards of excellence [CanMEDS role medical expert].*
- (4) **Skills outcomes:** A graduate shall have acquired and be able to demonstrate his or her proficiency in essential skills required for medical practice, including the following:
- (a) *The basic clinical skills [CanMEDS role of medical expert] –*
 - (i) *to take a history;*

- (ii) *to perform a physical examination and assess the mental state of a patient;*
 - (iii) *to interpret findings and make a diagnosis;*
 - (iv) *to formulate a plan for treatment and management based on sound professional reasoning and problem-solving abilities [CanMEDS role of professional]; and*
 - (v) *to be able to utilise diagnostic aids, as well as the services of professionals allied to medicine and to work as a member of a team to the advantage of the patient in rendering health services [CanMEDS role of professional and collaborator];*
 - (b) *skill in basic clinical procedures [CanMEDS role of medical expert];*
 - (c) *basic computer and management skills [CanMEDS role of manager and professional];*
 - (d) *communication skills [CanMEDS role of communicator];*
 - (e) *health promotion skills [CanMEDS role of health advocate];*
 - (f) *leadership skills and the ability to function as a member of a multidisciplinary team [CanMEDS role of leader and manager]; and*
 - (g) *skills required to accurately refer patients to appropriate resources [CanMEDS role of manager, communicator, collaborator].*
- (5) **Values and attitudes outcomes:** *A graduate shall have appropriate attitudes and behaviour patterns to ensure quality healthcare, which shall include –*
- (a) *a commitment to the healthcare of the community with regard to their physical, mental and social well-being [COPC principles];*
 - (b) *a recognition of the importance of primary healthcare and of a community-oriented approach to healthcare [COPC principles];*
 - (c) *the establishment of a commitment to lifelong learning [CanMEDS role of scholar and leader];*
 - (d) *a willingness to participate in self- and peer evaluations [CanMEDS role of scholar and leader];*
 - (e) *an awareness of personal limitations and a willingness to seek help when necessary [CanMEDS role of leader];*
 - (f) *recognition of and respect for human and patients' rights [community-based education and COPC principles];*
 - (g) *a commitment to professional practice and the ability to take independent medical decisions with due consideration of the ethics involved [CanMEDS role of professional, community-based education and COPC principles];*
 - (h) *acting as an advocate for his or her patients and communities [CanMEDS role of health advocate, collaborator and leader];*
 - (i) *being sensitive to health needs of the country [COPC and community-based education principles].*
- (6) **Requirements relating to the assessment of performance of students in medicine are the following.**
- (1) *Continuous assessment of both the knowledge and skills of a student shall be emphasised.*
 - (2) *The skills required by a student for admission to internship training shall be acquired under supervision and shall be assessed.*
 - (3) *The focus in the assessment of a student shall balance an emphasis on the recall of facts with an emphasis on problem-solving, critical thinking, clinical reasoning, clinical skills, professional competence and social values.*
 - (4) *The assessment and examination of prescribed modules may be integrated or divided (i.e., discipline-based) at the discretion of the educational institution concerned: Provided that there shall be some component of the final assessment that assesses a student's ability to adopt an integrated approach to clinical knowledge and reasoning.*
 - (5) *In order to ensure continuing assessment, examiners shall take into account the documented portfolios of a student's work throughout the course of study, including optional modules.*

Thus, from the above, similarities lead to parallels between

- (1) *HPCSA undergraduate curriculum objectives and [CanMEDS roles];*
- (2) *HPCSA undergraduate profile and [CanMEDS roles/attributes, COPC, community-based education];*
- (3) *HPCSA skills outcome and [CanMEDS roles, COPC, community-based education]; and*
- (4) *HPCSA values and attitudes outcomes and [CanMEDS roles, COPC, community-based education].*

Next, it is imperative to provide an overview of the UFS medical programme in terms of the above-mentioned roles, as discussed in Section 2.9.

2.10 DESCRIPTION OF UFS CURRICULUM

The description of the UFS curriculum will be presented in the next subsection in terms of how the MBChB programme is categorised in three phases (*cf.* Appendix K (b, c, d, e)) and throughout the five years, and in how assessment is applied in the programme.

2.10.1 The programme

In the year 2000, UFS adapted its undergraduate medical curriculum, from a more traditional curriculum spanning six years (in which the basic medical sciences were taught prior to more clinical subjects being introduced) to a five-year outcome-based curriculum, with a vertically and horizontally integrated two-and-a-half-year preclinical phase.

The UFS programme is divided into three phases. Phase I (*cf.* Table 2.4) is offered in Semester 1, Phase II (*cf.* Table 2.4) in Semesters 2 to 5, and Phase III (*cf.* Table 2.4) in Semesters 6 to 10. In Phases I and II, the contents are arranged in thematic or system-based modules. Phase III is devoted to clinical medicine. The programme as indicated in Table 2.4, can be elucidated as follows:

The MBChB programme is a five-year programme divided into three phases (10 semesters). A hallmark of this programme is the integrated modules from the first year (i.e., students' professional identity as future medical practitioners is formed from the first year), as well as integrated medical science assessments (MIMA examinations).

Phase I

Semester 1 of the first year. The following modules are included in Phase I: Health

psychology; The doctor and the environment; Concepts of health and disease; Tissues of the body; Structure and development of the body; and General skills.

Phase II

Semester 2 of the first year, Semesters 3 and 4 of the second year, and the first semester of the third year (Semester 5). The following modules are included in Phase II: Membranes, receptors, and principles of pharmacotherapy; Structure and development of the body; Molecules of the body; Metabolism; Mechanisms of disease; Infections and antimicrobial drugs; Epidemiology, biostatistics, and special study module; Urinary system; Respiratory system; Haematology and immunology; Cardiovascular system; Genital system; Gastrointestinal system; Nervous system; Endocrine system; Health and disease in populations; Human diversity; Human rights and legal ethics; and Clinical skills.

Phase III

Semester 2 of the third year (Semester 6) and the fourth (Semesters 7 & 8) and fifth years (Semesters 9 & 10). The following modules are included in Phase III: Health policy and service provision; Human life cycle; Reproduction; Internal medicine; Surgery; Paediatrics; Obstetrics and gynaecology; Psychiatry; Family medicine and anaesthesiology; Otorhinolaryngology; Ophthalmology; Urology; Oncology; and Orthopaedic surgery.

Table 2.4: Diagrammatic representation of the structure of the MBChB programme BC834100

PHASE I		PHASE II				PHASE III						
YEAR 1		YEAR 2		YEAR 3		YEAR 4 (196C)		YEAR 5 (200C)				
Semester 1 (84C)		Semester 2	Semester 3 (152C)	Semester 4 (88C)	Semester 5 (104 C)	Semesters 6 (36C)	Semester 7	Semester 8	Semester 9	Semester 10		
MPSY1513 (12C) Health Psychology	MIMA1513 (12C) Integrated Medical Science Assessment	MMEM1620 (0C) * MMEM2618 (32C) Membranes, Receptors and Principles of Pharmacotherapy		MURI2724 (16C) Urinary System	MRES3714 (16C) Respiratory System	MIMA3713(12C) Integrated Medical Science Assessment	MHEL3823 (12C) Health Policy and Service Provision	MINT4810 (52C) Internal Medicine	MINT4820 (52C) Internal Medicine	MIAM5810 (48C) Internal Medicine and Anaesthesiology	MIAM5820 (48C) Internal Medicine and Anaesthesiology	
MDOC1513 (12C) The Doctor and the Environment		MANA1620 (0C) ** MANA2618 (32C) Structure and Development of the Body (dissection programme)		MHAE2724 (16C) Haematology and Immunopathology	MHEA3714 (16C) Health and Disease in Populations				MSUR4810 (48C) Surgery (Otorhinolaryngology / Ophthalmology / Orthopaedics)	MSUR4820 (48C) Surgery (Otorhinolaryngology / Ophthalmology / Orthopaedics)	MSUR5810 (56C) Surgery (Orthopaedics, Urology and Trauma)	MSUR5820 (56C) Surgery (Orthopaedics, Urology and Trauma)
MCHD1513 (12C) Concepts of Health and Disease		MMOL1620 (0C)** MMOL2618 (32C) Molecules of the Body Metabolism		MCAR2724 (16C) Cardiovascular System	MNER3714 (16C) Nervous System							
MHIS1513 (12C) Tissues of the Body			MDIS2614 (16C) Mechanisms of Disease	MGEN2724 (16C) Genital System	MEND3714 (16C) Endocrine System		MSUR3820 (0C)** Surgery (Anaesthesiology)	MPSY4818 (32C) Psychiatry (Oncology)	MPSY4828 (32C) Psychiatry (Oncology)	MOBG5816 (24C) Obstetrics and Gynaecology	MOBG5826 (24C) Obstetrics and Gynaecology	
MANA1513 (12C) Structure and Development of the Body			MINF2614 (16C) Infections and Antimicrobial Drugs	MGAS2724 (16C) Gastrointestinal System	METH3714 (16C) Human Diversity, Human Rights and Legal Ethics							MPAE3823 (12C)** Paediatrics and Child health
MGEN1513 (12C) General Skills		MSSM1620 (0C) ** MSSM2613 (12C) Epidemiology, Biostatistics and Special Study Module (SSM)		MSSM2720 (0C) Epidemiology, Biostatistics and SSM	MSSM3712 (8C) Epidemiology, Biostatistics and SSM		MOBG3823 (12C)** Obstetrics and Gynaecology	Community-based education				
				MCLI2720 (0C) **	MCLI3713 (12C)							MPSY3820 (0C) ** Psychiatry
Level 8 Total Credits: 860 Notional Hours: 8600		Learning Development Programme (LDP) of 6 months for students that failed MIMA1620		Clinical Skills			MIMA2720 Integrated Medical Assessment Module Mark					

Source: UFS, 2020

2.10.2 Assessment rules

The UFS **Rule book** of the undergraduate medical programme of 2020 (*cf.* Appendix J) was used to highlight assessment in different phases and semesters as described below.

PHASE I – SEMESTER 1

At the end of Semester 1, the main examination opportunity is offered, comprising an integrated medical science assessment (MIMA1513). The format of the assessment is similar to the assessments of MIMA1513 during the semester and comprises two question papers that both must be passed independently.

PHASE II – SEMESTERS 2 AND 3

During the semesters, two integrated medical science assessments are offered, the marks of which contribute to the semester mark for MIMA2613, constituting 50% of the final mark in the written component of MIMA2613.

At the end of Semester 3, an integrated medical science assessment (MIMA2613) is offered, comprising a written and Objective Structured Practical Examination (OSPE) component. Both components must be passed independently.

PHASE II – SEMESTERS 4 AND 5

During the semesters, two integrated medical science assessments are offered, the marks of which contribute to the semester mark for MIMA3713, constituting 50% of the final mark of the written component of MIMA3713.

At the end of Semester 5, an integrated medical science assessment (MIMA3713) is offered. The main examination opportunity (MIMA3713) at the end of Semester 5 comprises one written integrated medical science assessment as well as an objective structured clinical examinations (OSCE) component, which includes an oral assessment. Both components must be passed independently.

PHASE III – SEMESTER 6

Marks obtained for assessments during Semester 6 are carried forward to Semesters 7 and 8. Assessment includes both written and clinical assessment where applicable, and marks obtained contribute a maximum of 50% to the module mark at the end of Semesters 7 and 8. Semester 6 will include a written component in Anaesthesiology from Semester 5 and both the written and clinical components of Semester 6.

There is no semester main examination opportunity in modules MINT 3820, MSUR 3820, MPAE 3823, MOBG 3823, and MPSY 3820 in Semester 6, as the modules are continued in Semesters 7 and 8 and assessed in those semesters.

PHASE III – SEMESTERS 7 AND 8

In Semesters 7 and 8, students will do four weeks of community-based education at training platforms in the community, as well as Interprofessional Education (IPE) at UFS and training platforms in the community as part of the community-based education rotation. Attendance of these community-based education rotations and IPE sessions is compulsory. Relevant rules and arrangements for the community-based education rotations and IPE sessions are described in the Phase III guide and community-based education guides respectively.

PHASE III – SEMESTERS 9 AND 10

The main examination opportunities in all the relevant modules of both Semesters 9 and 10 will be at the end of Semester 10 and will comprise a written and clinical component in most of the modules. This is considered a professional qualifying examination, and external examiners are involved in the assessment. These assessments deal with all clinical disciplines through which the students have rotated in the course of the preceding semesters, namely, Internal Medicine; General Surgery; Psychiatry; Paediatrics and Child Health; Obstetrics and Gynaecology; Family Medicine; Otorhinolaryngology; Orthopaedic Surgery; Urology; and Anaesthesiology.

A final clinical integrated assessment is offered in Family Medicine (MFAM5818/5828) at the end of Semester 10. This involves clinical cases and an OSCE during which the student is assessed regarding general clinical evaluation and treatment of a patient, as well as professional and communication skills, attitude, and conduct. If a student fails the

assessment in module MFAM, while all other modules are passed, only MFAM must be repeated for three months in the following year.

However, the most important critical research questions concerning the assessment of the UFS undergraduate medical programme are the following:

- i) Does continuous assessment of students comprehensively cover the CanMEDS medical expert role in terms of both knowledge and skills? The CanMEDS medical expert role is necessary for the student to be admitted into internship training under supervision.
- ii) Is the assessment balanced to cover all the aspects of the AfriMEDS framework?
- iii) Is the assessment integrated or divided?
- iv) Does the assessment promote interdisciplinary cooperation in teaching, training, research, and practice between healthcare workers and social welfare professions?

This study sought to answer these aforementioned questions.

2.11 APPLICABILITY OF THE CONTEMPORARY ASSESSMENT TOOLS

The applicability of the appropriate assessment tools for evaluating GAs and corresponding competencies have been subject of much debate. The lack of congruency in finding the most appropriate assessment method for assessing physician competence using the CanMEDS Physician Competency Framework prompted the Royal College of Physicians and Surgeons of Canada to develop assessment tools to guide medical educators as they evaluate physician competencies. These assessment tools (written tests, objective examination tests, simulations, orals, logbooks, portfolios) are widely used in the UFS undergraduate medical programme. In order to understand the meaning of the different assessment tools used in the assessment of AfriMEDS competencies, it is important to understand the definitions of terms used and their comparison as described in Appendix M.

It is also important to note that there is not a single best assessment method that suits every situation, each assessment method has its own strengths, reliability and limitations. What is important however, is the ability to implement an assessment method based on the available resource capacity to manage student numbers and the uniqueness of the training environment.

2.12 CONCLUSION

Even though the AfriMEDS physician competency framework has been developed, there are still gaps on how it can be implemented in the South African context, given the fact the assessment methods needs to be customised to the South African setting, based on historical disposition and resource allocations of medical schools. The evaluation of the implementation of AfriMEDS therefore becomes paramount, and necessitates the development of guidelines best suited to the local environment. CBME requires time, resource capacity and the relevant training platform. In the South African context, the medical schools have bigger numbers of students to contend with, and most often conduct training in resource constrained environment with limited training and support staff. Therefore, that makes CBME difficult to implement as compared to first world countries.

Even today, more than 20 years into democracy, the transformation of South African higher education remains a difficult process to manage, considering the events of history and higher education and considerations in the context of race, ethnicity, access, social justice, and education. It is also important to note the synergistic convergence of GAs and professional competencies over time in medical education. The next chapter will focus on the research methodology employed in this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

Research is more than just a process of gathering information, as is commonly suggested. Rather, it is about “answering unanswered questions or creating that which does not currently exist” (Goddard & Melville, 2001).

The preceding chapter reviewed literature relevant to this study. The purpose of this chapter is to elaborate on the research design and methodology that was briefly introduced in Chapter 1. The chapter will review the statement of the research problem, the research questions, as well as the aim and objectives of the study. In this chapter, the researcher will explain that the framework for the study entailed three main research components, namely, the research paradigm, research design, and research methodology. The three research components were embedded in a predominantly mixed-methods research approach, which will be discussed in greater depth in this chapter. In line with the mixed-methods research approach, the researcher will provide a description of the transformative paradigm and an explanation of why this research paradigm was considered the best fit for this study. Following this section, the research design and research methodology, that is, selection of the participants, data collection, and data analysis, will also be discussed. The remainder of this chapter will focus on the integrity of the study and will touch on validity and trustworthiness aspects, as well as ethical considerations and approval processes that were applied in the study.

It is important to mention from the onset the role of the researcher in the study. The researcher played a facilitative role. As a facilitator, the researcher ensured that the interview process was streamlined and effected correctly. The researcher also applied for a supplementary research grant and appointed a research assistant to conduct interviews so that the position of the principal researcher as a senior manager in the UFS School of Medicine did not have any undue influence on junior colleagues who participated in the study.

3.2 THE STUDY

Research methodology refers to a framework of the way scientific objectivity and rationality are applied to generate trustworthy findings. A mixed-methods case study design was used, that is, both qualitative and quantitative methods were used, as follows:

- i. The first part of data collection involved a qualitative methodology through secondary document analysis and semi-structured interviews. Secondary document analysis was to review the undergraduate medical curriculum and documents used to assess AfriMEDS physician competency role (GAs) components. This step assisted in broadening the conceptualisation of the problem in order to formulate research questions and to generate empirical data. This was followed by focused, semi-structured virtual interviews which were conducted with educators involved in the MBChB programme.
- ii. The second part of the data collection employed a quantitative methodology and involved a cross-sectional survey. An online questionnaire was distributed to newly qualified medical interns who were completing their internship in 2020 (first & second years) and who had studied at UFS.

3.2.1 Document analysis

Document analysis was conducted by making use of pre-determined themes derived from the Afrimeds competency framework (*cf.* Appendix A, B) and also to answer the research questions (*cf.* 1.5). The competencies of medical expert, communicator collaborator, leadership and management, advocate, professional and community engagement, were searched using Microsoft word find. The undergraduate medical programme phase guides (*cf.* Table 4.1), undergraduate rule book, a workshop presented, and the HPCSA accreditation reports of 2015 and 2017 were then analysed to see how many times the Afrimeds competencies feature in the documents, in further analysed to see how was the implementation and assessment of these competencies done in alignment with the research aim and questions.

Accreditation of the educational programme plays a pivotal role in the quality assurance of the medical curricula. The approval of accreditation is subject to institutions' compliance with the specified terms and conditions in the accreditation report, and submission of annual reports and progress reports on compliance. The undergraduate medical programme was

due for accreditation in 2020, but it was postponed to August of 2021, which was also cancelled due to the COVID-19 pandemic.

Existing documentation concerning curriculum and all other relevant documents pertaining to training and assessment, with a specific focus on all domains of CBME and their outcomes, were evaluated to determine how they are covered and assessed in the programme. The following documents were analysed: a) HPCSA 2017 accreditation report, b) Phase module guides, c) Undergraduate rule book, and d) The MBChB curriculum review summit in 2019.

3.2.2 Semi-structured interviews

Semi-structured interviews involved educators and phase chairs in each phase of the five-year programme. Interviews involving the programme manager and student support services were also conducted. Student support services included student academic support. A standard interview guide was used for interviews using predetermined themes from Afrimeds competency framework (*cf.* Appendix B). The interviews were conducted not by the researcher but by an external researcher to minimize bias, as the researcher is a senior manager at the UFS Faculty of Health Sciences.

The purpose of the interview was to ascertain the involvement of educators in the implementation and assessment of the Afrimeds physician competency framework, as a result the interview guide was developed in line with the Afrimeds framework. The interview guide used to interview educators had two main components, namely, (1) Level of involvement in the undergraduate medical programme and (2) Evaluation of sufficiency of the seven individual AfriMEDS competency roles in the UFS MBChB programme. Questions evaluating their involvement in training using the AfriMEDS competencies were answered using three (3) options (yes, no, not sure). Open-ended, qualitative-style questions were also used to measure educators' assessment methods. Participants also had the opportunity to share their experiences in teaching and learning in evaluating the implementation and assessment of AfriMEDS in the UFS undergraduate medical programme (*cf.* Appendix B).

3.2.3 Online questionnaire survey

The online questionnaire was developed in order to answer the research question (*cf.* 1.5). The online questionnaire evaluated whether the AfriMEDS domain outcomes were

sufficiently covered in the undergraduate programme and how the outcomes translated into medical internship (*cf.* Appendix A).

The Online questionnaire was administered through an online survey with a link to an online EvaSys questionnaire, sent electronically by the UFS School of Clinical Medicine to first and second year medical interns (whole cohort of 240 students), who had studied at UFS and registered with the HPCSA in 2020 for medical internship.

The online questionnaire that was sent to medical interns comprised four sections: demographic information; review of the interns' experiences during internship; the application of the AfriMEDS competency framework in their working environment; and reflections on assessment during their undergraduate studies. The medical interns were requested to complete the questionnaire and return it to the researcher by email. The information collected includes demographic information and key competency information. The online questionnaire determined the extent to which GAs had been embedded during respondents' training and community-based education at UFS, and determined how competencies were developed during their work experience. The online questionnaire was of key importance, as it evaluated the fitness for purpose of the AfriMEDS framework in the MBChB programme. Questions evaluating their experiences had to be answered on a 5-point Likert scale (strongly agree, agree, neutral, disagree, & strongly disagree). Open-ended, qualitative-style questions were also included to give participants the opportunity to share their opinions on their experiences.

3.3 RESEARCH FRAMEWORK FOR THE STUDY

This section will present a review of the research problem statement, research questions, research aim, as well as the research objectives of this study. The research framework and three essential components involved in different research approaches, namely, qualitative, quantitative, and mixed-methods, will be discussed. These three components are the research paradigm or worldview, research design, and research methodology, and the interaction of these three components.

3.3.1 Transformative Research Paradigm

To determine the adequacy and relevance of the UFS undergraduate medical programme for meeting the HPCSA accreditation requirements and for addressing community needs, it is necessary to have an in-depth understanding of the desired outcomes of the programme.

The questions addressed by this study relate to determining how AfriMEDS competencies are implemented and assessed in the MBChB curriculum. A research paradigm gives a detailed account of how the researcher chooses a certain approach to the study.

The mixed-methods approach employed in this study followed a transformative paradigm, which provided a suitable framework for addressing issues of engaged scholarship and meeting societal needs. The transformative paradigm is a metaphysical framework that examines and addresses dimensions of ethics in terms of power issues and building relationships, social justice, and cultural complexity throughout the research process (Mertens, 2005).

Research is a systematic method of knowledge construction (Mertens, 2010); it needs a foundation, and researchers need to be cognisant of the implicit worldviews or paradigms they bring to their studies (Creswell, 2014:5; Creswell & Plano Clark, 2007:22-23). According to Guba (1990), research paradigms can be understood by addressing three basic questions: ontological, epistemological, and methodological. Research paradigms should provide a framework that guides a study, which explains how a researcher can know or understand reality and provides the foundation for a research study (Nieuwenhuis, 2007, p.47-48; Mertens, 2010). There are four sets of philosophical assumptions that are most relevant to defining a paradigm in a research context (Guba & Lincoln, 2005):

- (a) The ontological assumption is concerned with the nature of reality. How does one know that something is real? The assumption here is about finding out what is real and what type of evidence will be acceptable to convince someone that it is indeed real or has any other conceptual characteristic.
- (b) The epistemological assumption is concerned with the relationship between I (knower) and the research participants (would-be known). Epistemological questions include, If the researcher wants to know if something is real, how does the researcher relate to the research participants from whom or where data is being collected? Should the researcher be close to the participants to be able to understand their experiences, or should the researcher maintain distance from the participants so that there is "neutrality"? These questions refer to the definition of objectivity as implemented in a research context.
- (c) The methodological assumption relates to the appropriate approach to systematic inquiry. Methodologically, what choices are available to collect information: quantitative, qualitative, or mixed-methods, and how can data reflective of the reality

of human experiences be collected such that there is confidence that reality has been captured in the best way possible?

- (d) The axiological assumption relates to the nature of ethics. Axiology is the basis on which ethical theory is defined and practised in research. What is considered ethical or moral behaviour? How are ethical issues addressed when conducting research in culturally complex communities? What are ethical dilemmas that need to be addressed in the research context?

In practice, various research paradigms are used in social science research, with the two main types being quantitative and qualitative research (Mills, Eurepos & Wiebe, 2010). Some social science researchers are proponents of quantitative research, some prefer qualitative research (Mills, Durepos & Wiebe, 2010), while others prefer to combine the approaches. Some social science researchers argue that using these two different approaches together improves understanding of a phenomenon (Atieno, 2009). In fact, the concept of mixed methods is paradoxical, as the quantitative and qualitative research paradigms hold different ontological theories (Atieno, 2009). A quantitative or positivist perspective is based on an independent, single reality, while the qualitative or interpretive perspective holds assumptions of multiple contextual realities (Harrison et al., 2017). This reasoning suggests that philosophical assumptions shape the nature of any research, including mixed-methods case study research.

This study employed mixed methods and triangulated data. Bhatta (2018) remarks that, surprisingly, there are more misunderstandings associated with mixed methods than there are challenges.

In the context of the transformative paradigm, the role of the researcher is crucial in that it revolves around recognising inequalities and injustices in society, and striving to challenge the status quo and determining who possesses a shared sense of responsibility (Mertens, 2007). This study was positioned within a transformative research paradigm, as it includes, among others, information on the current state of community-based medical education transformation as a focal point of the study, through which the researcher sought to determine how the UFS medical school, through AfriMEDS as a transformative pedagogical tool, can contribute to improving curriculum delivery, which will ultimately impact and contribute to the quality of services received by people at community level.

Methodologically, the transformative paradigm that is applicable to this study requires that

a researcher reframes the understanding of worldviews and subsequent methodological decisions (Mertens, 2005). This reframing of methodological decisions is what led to the use of mixed methods, which requires community participation throughout the process in order to gain an understanding of the depth of cultural issues involved, to build trust, to obtain and validate data, and to implement the data through community involvement (Mertens, 2007). Triangulation enables researchers who use the transformative paradigm to collect different types of data for different purposes by employing an array of qualitative and quantitative methods, such as interviews, observations, document review, and surveys, since these methods enable researchers to gather the perspectives of people involved in the research study (Mertens, 2007). The transformative paradigm in this study is applicable, whereby the evaluation of the UFS MBChB programme in terms of how it implements and assesses AfriMEDS physician competency framework is critiqued, leading to recommendations that could assist in transforming pedagogy and curriculum.

3.3.2 Research design

Research design is a detailed description of the procedures for conducting a study (McMillan & Schumacher, 2010). The purpose of the research design used for this study was to specify a plan for generating empirical evidence that will be used to answer the research questions. This study followed a mixed-methods case study design, which was framed in a mixed-method research methodology.

This system of inquiry is what is defined as mixed-methods research, which is an approach to inquiry that combines both quantitative and qualitative forms of inquiry (Creswell, 2014). This kind of approach provides a better understanding of the research questions than either approach alone could achieve (Creswell & Plano Clark, 2007). The study followed the convergent parallel design of Creswell and Plano Clark (2007), where both qualitative and quantitative data were gathered, analysed, and compared on how they relate and are interpreted.

Combining or integrating quantitative and qualitative approaches as part of a mixed-methods study is explained in Figure 3.1.

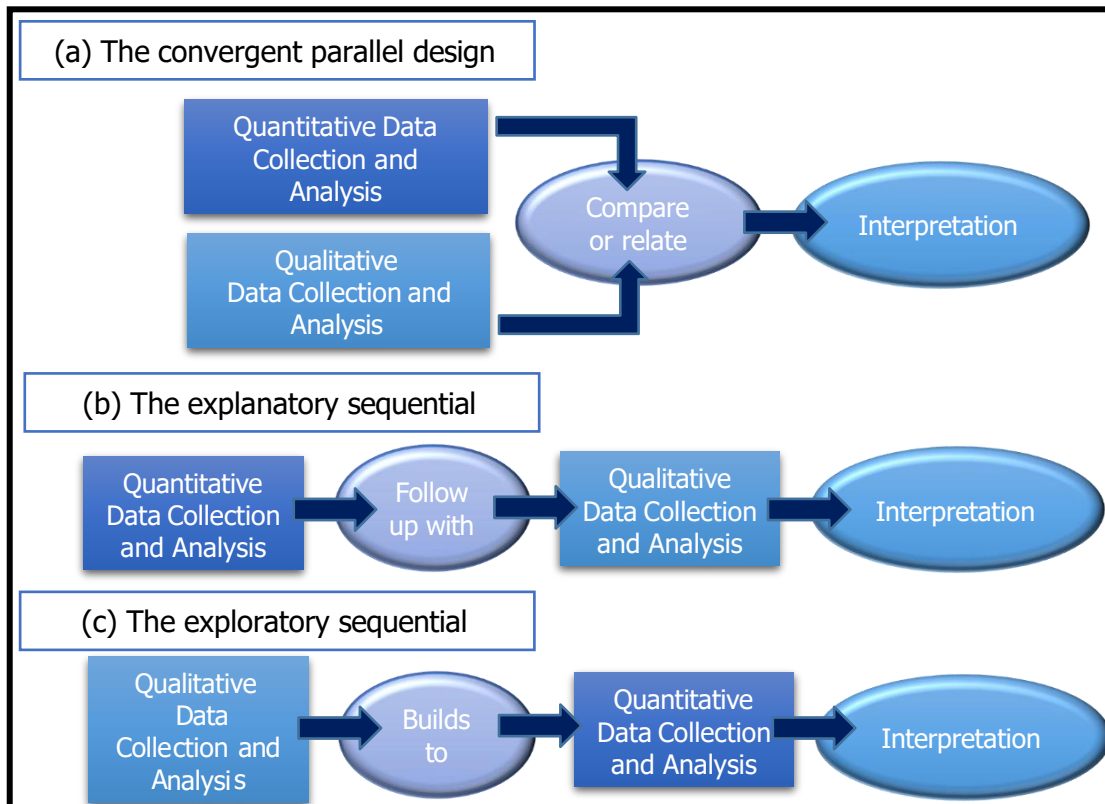


Figure 3.1: Mixed-methods research designs
Source: Creswell and Plano Clark, 2011

3.3.3 Defining a mixed-methods case study research design

There are nine medical schools in South Africa; however, in this instance, the UFS medical school is the individual case. In each situation, an individual person (medical school) is the case being studied. Information about the relevant individual (medical school) was collected, and several such individual cases might be included in a multiple-mixed-methods case study (Yin, 2018:29).

In defining cases, classic case studies usually focus on an individual person as the case (Yin, 2018:28). A mixed-methods case study can be some event or entity other than a single person. It may include small groups, communities, decisions, programmes, non-profit organisations, organisational learning, schools, social movements, or even disaster recovery efforts (Yin, 2018:28). A case does not necessarily have a beginning or endpoints, and it is not analogous to a single experiment. For example, a specific programme may reveal:

- Variations in programme definition, depending on the perspectives of different actors; and/or

- Programme components, pre-existing or not.

This study involved a single mixed-methods case study design that is illustrative in nature, and this was appropriate, given that the researcher could not find published data regarding the evaluation of the implementation of the AfriMEDS framework in the South African medical education system and guidelines. The findings of this study and recommendations could serve as a guideline that could be customised and replicated by other medical schools.

3.3.4 Rationales for single-case designs

Three of the five rationales proposed by Yin (2018) for a single-case design apply to this study, and they will be discussed in the following subsections.

3.3.4.1 *Critical case*

A critical case is one that is significant for the theory or theoretical proposition and knowledge contribution. The single case used in this study represents a significant contribution to knowledge and can inform future investigations (Yin, 2018:49).

South Africa currently faces two main challenges regarding health. One challenge is on the service delivery front, where citizens are beset by a quadruple burden of disease – HIV and tuberculosis, child and maternal deaths, trauma and accidents, and non-communicable diseases, in addition to mental health issues (Mayosi, Flisher & Lalloo, 2009). Other challenges have to do with human resources relating to the maldistribution of healthcare workers and a critical shortage of skills due to urbanisation and migration (Mayosi, Flisher & Lalloo, 2009). Concurrently, the government is in the process of implementing a national health insurance, in which medical practitioners play the important role of leading diverse, multidisciplinary teams of skilled healthcare workers. How this context applies to UFS means the study is valuable; how the university is positioned to address the health challenges of the country is, therefore, of critical importance.

3.3.4.2 *Extreme or unusual*

This rationale refers to single-case scenarios that deviate from theoretical norms or even everyday occurrences. In clinical research, this rationale may relate to unusual incidents or findings that are in juxtaposition to the common case that captures normal, everyday situations.

The five-year curriculum at UFS and the expectation of the HPCSA that the university should be able to offer training while also expanding the training platform offers an opportunity for extreme or unusual findings. All medical schools in South Africa are expected to expand their training platforms to accommodate at least an additional 3 000 South African medical students in total who had trained in Cuba under the Nelson Mandela-Fidel Castro Medical Programme (NMFCMP). The integration of students under the NMFCMP is being rolled out over three years and started in 2018. The burden associated with teaching and training of NMFCMP students is enormous, as it requires the extension of the training platform, which involves human capital investment and infrastructure development in an already resource-constrained training platform.

3.3.4.3 Revelatory

This rationale refers to a situation that had previously been inaccessible to social science inquiry or researchers uncovering prevalent phenomena that had previously been inaccessible. In the UFS context, this type of case may offer the opportunity to observe and analyse phenomena that could be prevalent but not previously discernible. The relevance of the study is established by the fact that the researcher could not find available data on the evaluation and implementation of AfriMEDS in South African medical schools.

3.3.5 Mixed-methods design

According to Yin (2018:63), “[m]ixed-methods research combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study”. A single study forces the methods to share the same research questions, to collect complementary data, and to conduct counterpart analyses (Yin, 2018:63).

Mixed methods have the advantage that they enable the researcher to address more complicated research questions and collect richer and stronger data than may be accomplished by any single method alone (Yin, 2018:63). Mixed methods enable a researcher to address broader or more complicated research questions than case studies alone would (Yin, 2018).

Multiple sources of evidence, such as experiments, surveys, or histories, are useful in mixed-methods case study research, as they make possible:

- In-depth analysis of the study or phenomenon in its real-world context;

- Studying the context over a period of time, both in depth and contextually; and
- Collecting a variety of data from multiple sources (Yin, 2018).

Four basic types of mixed methods are described in the literature, namely, triangulation (to obtain different but complementary data), exploratory (which is also two-phased but led by the qualitative), explanatory (which builds or explains quantitative results), and the embedded types (in which one data set provides a supportive secondary role) (Ivankova, Creswell & Stick, 2006; Creswell & Plano Clark, 2007). Creswell and Plano Clark's (2007) embedded, triangulated, and exploratory categories all include qualitative dominant design variants, in which emphasis is placed on the qualitative and the constructivist-interpretive mental model governs.

This study followed a triangulation mixed-methods design type, of which the purpose was "to obtain different but complementary data on the same topic" and to understand the research problem in the best way possible (Creswell & Plano Clark, 2007:63). Creswell et al. (2003) state that the intent of using this design is to bring together the different strengths and non-overlapping weaknesses of quantitative methods and those of qualitative methods. This design is used when a researcher wants to directly compare and contrast quantitative statistical results with qualitative findings or to validate or expand quantitative results with qualitative data (Creswell & Plano Clark, 2007).

3.4 DATA GATHERING TECHNIQUES

3.4.1 Population and sample

The study was conducted at the UFS medical school in South Africa and makes particular reference to the undergraduate medical programme.

Stage 1: This involved document analysis of the medical programme. This stage involved a review of all module phase guides and the last accreditation report in order to evaluate the scope to which GAs are implemented, including the AfriMEDS framework and how they are assessed.

Stage 2: For the main study, 15 people involved in student training were interviewed, who were either educators, phase chairs, coordinators, or directors.

Stage 3: This involved 71 medical interns in total who graduated from UFS and were doing first- and second-year internships in 2020 and voluntarily participated in the online survey.

Figure 3.2 describes the selection criteria for participants for Stages 2 and 3 of this study.

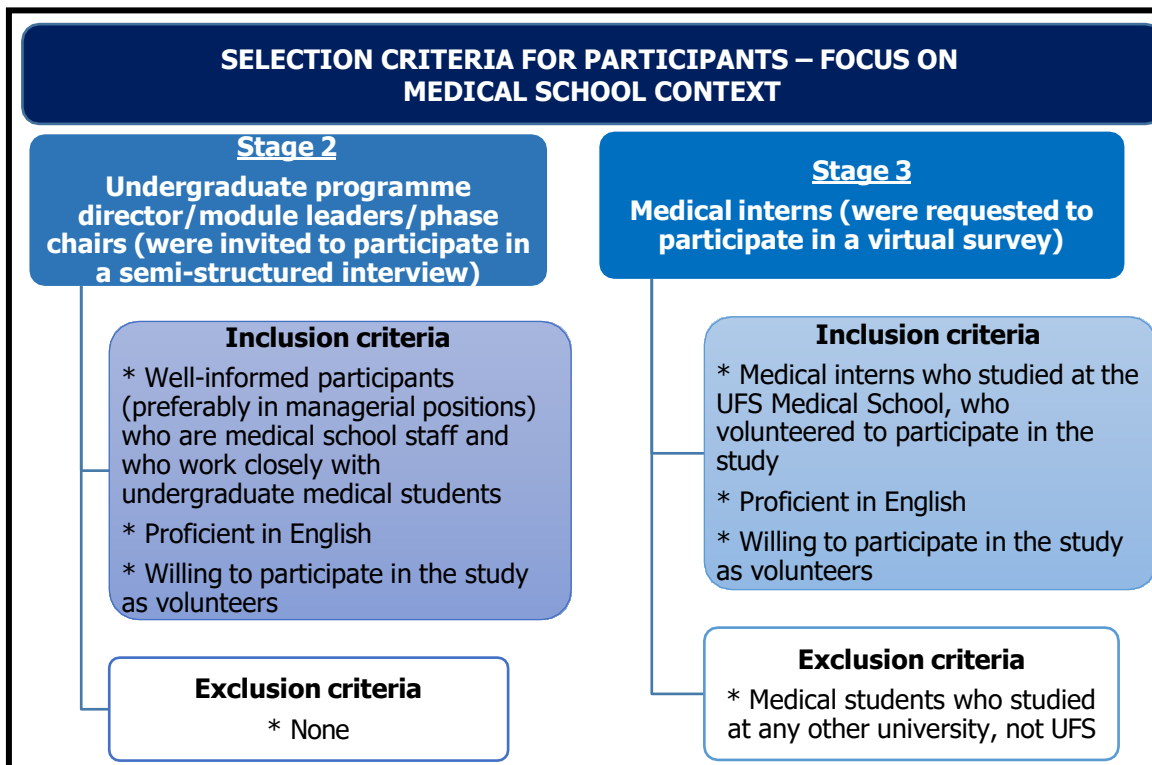


Figure 3.2: Selection criteria for participants in Stages 2 and 3

3.4.2 Sample selection

Sampling methods in research may be broadly divided into two groups, namely, for quantitative research and for qualitative research. For each of these research processes, the methods can be divided further into random and non-random sampling, depending on the purpose of the research. Random sampling includes methods such as unrestricted random sampling, simple random sampling, systematic random sampling, stratified random sampling, cluster sampling, as well as other techniques with slight variations in the sampling methods. The results of random sampling are often used to draw conclusions on how the research would apply to a wider population (Bowling, 2002:187).

Non-random sampling is usually conducted for purposes of understanding complex phenomena and to generate hypotheses rather than to apply findings to a wider population. Sampling methods for qualitative research often involve methods such as convenience sampling, purposive sampling, snowballing, and theoretical sampling. While these methods are non-random, they may be specifically used to obtain a particular understanding of a condition or problem in a select community in the population (Bowling, 2002:187).

The sample design of this study involved convenient and targeted sampling. The targeted sample involved medical interns, and the convenient sample involved the programme director, educators, phase chairs, and student support. Targeted sampling was used to identify educators for the semi-structured virtual interviews. In targeted sampling, the population is homogeneous, as all educators are involved in the undergraduate medical programme. The educators had different roles and responsibilities but were involved in the different phases of the medical undergraduate programme.

3.4.2.1 *Target population*

A target population entails individuals who all possess specific characteristics (De Vos, 2005). In the case of this study, the two targeted populations were medical interns registered with the HPCSA in 2020 and who had studied at UFS, and academic staff involved in the undergraduate medical programme.

An address list, with registration numbers, surnames and initials, as well as email addresses and cell numbers, was obtained from the office of the UFS undergraduate medical programme management. Academic staff members involved in the MBChB programme were identified and invited to voluntarily participate in the study.

3.4.2.2 *Sample size*

Document analysis was done by evaluating three-phase guides booklets (phase 1-3), undergraduate curriculum review 2019 retreat documents, and the 2017 UFS HPCSA MBChB undergraduate accreditation report.

For conducting semi-structured interviews, convenient targeted sampling was followed by 15 individual virtual interviews. These were conducted with educators and phase chairs involved in undergraduate medical teaching throughout the years, and the MBChB programme director, so, no sampling was needed.

The online questionnaire targeted the whole 2020 cohort of UFS first- and second-year medical interns (240, about 120 per year), who had studied at UFS and were included in the quantitative study. This group of medical interns make the sample homogenous; therefore, no sampling was needed. The target was about 240 medical interns, but the researcher could only reach 225 medical interns who had valid emails. Only 71 medical

interns responded to the online questionnaire, which gave a response rate of 31% (n=71).

3.4.3 Pilot study

To streamline the research process, it is important to conduct a smaller version of the research study to identify possible problems and pitfalls in the proposed technique, and to ensure that the most efficient and appropriate research instrument is used. This process is generally referred to as a pilot study. A pilot study is a small study that is often conducted to test the feasibility of a proposed study (Van Teijlingen et al., 2001:11; Yin, 2018).

Feasibility refers to the possibility of actually conducting the study as proposed. It involves checking the instruments used for data collection and the logistics of performing the study. A further important reason for a pilot study in this research was to improve the internal validity of the questionnaires used. Van Teijlingen et al. (2001:11) explain that pilot studies refer to mini versions of a full-scale study (also called feasibility studies) and could involve the specific pre-testing of a particular research instrument, such as a questionnaire or an interview schedule. They suggest that, even though performing a pilot study does not guarantee success in the main study, it does, at least, increase the likelihood of it, and that pilot studies fulfil a range of important functions and can provide valuable insights for other researchers.

Peat et al. (2002:123), list a number of aspects of a pilot study that may improve the proposed questionnaire:

- *administer the questionnaire to pilot participants in exactly the same way as it was administered in the main study;*
- *ask the participants for feedback to identify ambiguities and difficult questions;*
- *record the time taken to complete the questionnaire and decide whether it is reasonable;*
- *discard all unnecessary, difficult or ambiguous questions;*
- *assess whether each question gives an adequate range of responses;*
- *establish that replies can be interpreted in terms of the information that is required;*
- *check that all questions are answered;*
- *re-word or re-scale any questions that are not answered as expected;*
- *shorten, revise, and if possible, pilot again.*

As part of preparation for the interviews, a pilot test was conducted to evaluate the interview design and to determine if the semi-structured interview guide and the online questionnaire had any flaws and weaknesses. Five faculty members were requested to complete the online questionnaire and to give feedback regarding its usefulness, and to assess whether the questions would be clear enough for the participants during self-

administration. The information collected from the five faculty members was not included in the study. The five faculty members selected to participate in the pilot were from the research office, involved in research administration and support in the school of medicine. The feedback from the pilot was on two fronts, namely:

- a) The logistics of the study implementation in terms of:
 - The timing in the collection of data (starting in November vs December 2020);
 - The expected target response rate of 50% and higher; and
 - Streamlining and coordinating the research approval process and obtaining permission to conduct the study from the relevant authorities;
- b) Clarification on the questionnaire in terms of:
 - Demographic information: race vs ethnicity, to include or exclude;
 - Area of specialisation, which had to be broader and more specific;
 - Internship experience questions, which should be more specific in terms of different disciplines; and
 - Undergraduate training questions, which had to be sufficiently clear and understandable.

3.4.4 Data gathering

The data was gathered using the convergent parallel design method (*cf.* Figure 3.1 (a)). The data was collected first from document analysis; secondly, from semi-structured interviews; and thirdly, from the online questionnaire. All of the three data collecting processes were done independent from each other, but the data gathered was triangulated to determine how it compared or related to each other. From the document analysis, the AfriMEDS core competencies were evaluated on how they are implemented and assessed. For the semi-structured interviews were audio-recorded and then transcribed verbatim. The transcripts were read for initial impressions, and to identify keywords and phrases to detect trends. Then secondly, the quantitative data was collected using an online survey. Analysis of the transcripts was completed using NVivo 12 software.

Data gathering concerning the online questionnaire: The online questionnaire was sent by email, and it involved about 240, first- and second-year medical interns who were registered for internship with the HPCSA in 2020. Annually, about 120 students graduate from the UFS MBChB programme. The researcher relied on the database of students who had finished either in 2018 or 2019, one to two years prior to the study.

3.4.4.1 Document analysis

Qualitative data gathering

For document analysis, the researcher used word search covering Afrimed's physician competencies through the phase guides, the 2017 HPCSA accreditation report (*cf.* Appendix K), and the MBChB Rules (*cf.* Appendix J), to get the frequencies of core AfriMEDS competencies and how they are implemented and assessed in semester guides. Document analysis of phase guides generated main themes (with various subthemes) from the data to support the research question.

3.4.4.2 Semi-structured interviews

a) Qualitative data gathering

The researcher opted not to conduct the interviews himself to minimize bias of interviewing his colleagues in an environment where he is well-known, instead he employed services of an external researcher who is an expert in Curriculum Studies and well-versed with research in higher education.

The main themes from the interview questions were derived from the Afrimed's core competence under investigation. Therefore, themes were pre-determined (*cf.* Appendix B). This has been consistently demonstrated from Chapter 3 onwards.

Data gathering for the semi-structured interview process was handled as highlighted below.

The first step of the interview was to establish rapport and introduce the research study to the participants who consented to be interviewed. A summary of the aims and objectives of the study and the interview process, and a copy of the consent form were provided. After the introduction and having obtained informed consent from the 15 participants of the school of medicine, the interviewer scheduled the interviews.

Interviews were conducted on an online UFS-approved electronic platform using Blackboard Collaborate in a convenient and private setting, away from distractions. Each participant was allowed to choose where they wanted the interview to take place. All interviews were recorded. Participants gave written consent and verbal consent.

The methodology employed to conduct research interviews was as follows:

- i. Step 1: The individual online interviews were audio-recorded and then transcribed verbatim via Otter.ai. The transcripts were read for initial impressions and to identify keywords and phrases, to detect trends.
- ii. Step 2: Analysis of the transcripts was completed using NVivo 12 software. Keeping in mind the research questions, a coding process was employed by working within a source (a transcript) and selecting, grouping, and labelling related data into themes. Manual coding (the process of grouping related data into a container called a node) was employed by working within a source (a transcript) to select content and then code it.
- iii. Step 3: Verbatim nodes were exported from NVivo and organised into themes and subthemes. Themes were identified from a collection of excerpts from transcripts (nodes) on quantity and intent of statement, and connection through multiple triangulations. Some items elevated to the level of theme or subtheme based on the number of times a keyword or phrase appeared in the transcripts.
- iv. Step 4: As nodes were analysed further using triangulation of data from interactive discussions with educators and faculty members, open questions in the intern survey, and document analysis of phase guides, main themes (with various subthemes) emerged from the data to support the research question.

3.4.4.3 *Online questionnaire*

(a) Quantitative data gathering

Data gathering concerning the online questionnaire (*cf.* Appendix A): The online questionnaire involved the first- and second-year medical interns who were registered for internship with the HPCSA in 2020. The researcher relied on the database of students who had finished one to two years prior to the study. An online questionnaire was sent by email to finishing UFS-qualified medical interns.

Although the study aimed to obtain responses from at least 120 (50%) of the 240 eligible participants from the two groups of medical interns, the contact details of some of the students were invalid. After comparing and deleting duplicate email addresses in the spreadsheet of the database, there were 235 email addresses. About 4.2% of email addresses were not valid and could, therefore, not be delivered. So, about 225 emails were

sent requesting the medical interns to complete an online survey questionnaire; this was accompanied with the study information letter (*cf.* Appendix C) and a consent form (*cf.* Appendix D). Medical interns were granted six weeks to complete the online survey via a link to the online EvaSys questionnaire, which was sent electronically by the UFS School of Clinical Medicine to potential participants. Invitations to participate were distributed on 23 November 2020, with the initial closing date as end of January 2021 (10 weeks). Reminders were sent weekly from the middle of December 2020 until end of January 2021; respondents who had already returned the questionnaire were asked to ignore the reminder.

The online survey was available only in English, as this is UFS's official language of communication. Participants were informed that participation in the research was voluntary and that they would not be penalised or lose benefits of any type if they refused to participate or decided to terminate participation. Participation in the study by participants implied consent. The questionnaire was not completed anonymously, but the participants were ensured that the results would be handled confidentially. Only 71 interns responded, which gives a response rate of 31% (although the target was a 50% response rate).

Nulty (2008) confirmed the findings of earlier studies. Nulty quotes Cook et al. (2000), who found that, in general, online surveys are much less likely to achieve response rates as high as surveys administered on paper, despite the use of various practices to increase the response rate. Most online surveys achieve response rates that are much lower than paper-based surveys (on average, 33% compared to 56% = 23% lower) (Nulty, 2008). A table guide was formulated, based on complex formulas, as a guide for response rates, and which could indicate what can be considered adequate. However, great care and caution need to be exercised to ensure that the results of a survey are representative of the whole group of participants enrolled (Nulty, 2008). According to this table guide (Nulty, 2008), a study that enrolls about 200 students under "Liberal conditions" can expect 23 students to participate, which is a response rate of 12%. For a study enrolling 250 students, 24 students can be expected to participate, which gives a response rate of 10%. In contrast, under "Stringent conditions" and using the same numbers, the expected response rates of 77% and 73% will apply respectively.

Thus, in general, the response rate to the interns' online surveys indicates a higher-than-expected response rate under "Liberal conditions", but a rate far below that expected under "Stringent conditions". However, taking into consideration the COVID-19 pandemic and the

contact details of interns having changed, the response rate of this study can be deemed acceptable.

“Liberal conditions” refer to conditions where there is a 10% sampling error and 80% confidence level, whereas “Stringent conditions” refer to a 3% sampling error and 95% confidence level (Nulty, 2008).

3.5 DATA ANALYSIS METHODS

The data analysis methods used in this study will be discussed in this section.

3.5.1 Data management and analysis

In this study, the following types of analysis were conducted:

- i. Structural (network/programme) analysis (documents), supplemented by qualitative analysis of experience;
- ii. Qualitative analysis of experience (educators), followed by quantitative modelling of relationships;
- iii. Quantitative description of core competencies of medical interns, followed by qualitative analysis of experiences;
- iv. Content analysis of frequency patterns in qualitative data and quantitative modelling of relationships; and
- v. Case comparisons that drew on both qualitative and quantitative data.

Since the study employed both qualitative and quantitative methods, data was captured through document analysis, audio recordings, and self-administered online questionnaires after anonymisation. The researcher stored the recorded transcripts in an encrypted computer file. All the data from the qualitative and quantitative methods were captured electronically in Excel, and the document was password-protected. Qualitative data was analysed by the researcher. Quantitative data was analysed by the researcher under the guidance of a biostatistician.

(a) Qualitative data analysis

A content analysis approach (Hsieh and Shannon, 2005) was used to analyse the qualitative

data gathered from document analysis, and semi-structured interview discussions and open questions. The process started with the document analysis of MBChB phase guides, reports from the HPCSA, and an undergraduate medical curriculum workshop. This was done in order to identify gaps, amplify research questions, and strengthen areas of research interest.

After document analysis was completed, the semi-structured interviews were followed, which were performed using the transcribed interview discussions. Each transcript was read several times to gain a general understanding of the captured information. Then, the transcripts were read more closely to highlight words or phrases that capture the essence of the competency constructs. A code was then assigned to each keyword or phrase to form categories/themes of the process, in line with the subcategories of the self-administered questionnaire. Each category/theme was scrutinised and relabelled, or subcategorised as appropriate. Text that captured new perspectives that could not be coded into the predetermined competency categories was assigned a new label. The views generated during the interviews of the lecturer was subsequently triangulated with the findings of the quantitative data. Analysis of the transcript was completed using NVivo 12 software.

(b) Quantitative data analysis

All quantitative data was analysed using STATA© software Version 12 (StataCorp, 2011). All survey data was analysed using descriptive statistics, such as frequencies and percentages, together with 95% confidence intervals. In addition, scores of each subcategory of competencies were created based on the activities measuring each subcategory. These scales were described using means and standard deviations, together with ranges and medians of 95% confidence intervals. Any other relevant statistical analysis method was used as required by the available data.

The collected data was tabulated and expressed graphically. The data was analysed using descriptive statistics. Exploratory data analysis was performed using frequencies and scatter plots.

The instrument consists of nine core medical training competency dimensions. The dimensions measured the perceptions of the respondent regarding the extent to which there was sufficient assessment of core competency during the undergraduate medical programme. Agreement relating to each core competency dimension has six to nine items,

and a 5-point Likert scale for agreement ranged from "Strongly agree" to "Strongly disagree", as follows: 1=Strongly agree, 2=Agree, 3=Neutral, 4=Disagree, and 5=Strongly disagree.

Strongly agree and Agree were regarded as positive responses for each single item. Positive responses for single item results are presented as counts (n) and percentages (%) for each item (*cf.* Figures 5.1–5.9). Furthermore, Strongly agree and Agree were combined to form "Category Agree", and Strongly disagree and Disagree were combined for "Category Disagree". These results are presented as counts (n) and percentages (%) in Annexure H.

Numerical core competency dimensional scores for each participant were generated for each of the nine core competencies based on information (item numbers) (*cf.* Table 5.14). The participant average percentage of positive responses (example responses "1" & "2") per group of items measuring each core competency dimension was derived, and the results were used to generate the positive composite core competency scales. These scales were analysed using descriptive statistics, such as the mean standard deviation and 95% confidence intervals, median and mode, and so on. The differences in the average positive composite core competency scales for first-year interns and second-year interns were compared using a t-test. Correlation analysis was used to assess the relationship between the positive composite core competency scales.

To assess the composite positive responses of a scale, the positive composite core competency scales were categorised into three groups, as follows: <50% of items scored positively; 50% to <80% of items scored positively, and 80% to 100% of items scored positively. These categorised results were presented as counts (n) and as percentages (%), as well as graphically. Any associations between the categorised positive composite core competency scale and year of internship were assessed using a chi-square test. Some of these results are presented in Appendix G, Appendix H, & Appendix L. All the data was analysed using STATA 12.

3.5.2 Generation of positive composite core competency scales

The items used for the numerical scores (*cf.* Table 4.4) were measured on a 5-point Likert scale (1=Strongly disagree to 5=Strongly agree) as described in Table 4.3. Individual responses to each item were classified as positive if the actual response was "1=Strongly agree" or "2=Agree". Composite core competency scores for each of the nine scales were

computed by summing the responses for each item, with lower scores indicating more positive perceptions of sufficient assessment of the core competency during the undergraduate medical programme. For each respondent, the number of items with positive responses for each core competency was divided by the number of items in the same core competency and multiplied by 100. These core competency scores could, therefore, range from 0 to 100; a low value represents fewer items with positive perceptions of core competency being sufficiently assessed during the undergraduate medical programme. Reliability was estimated by application of internal reliability consistency criteria (Cronbach's α 0.70). The average inter-item correlation for each scale was also measured. The items for each core competency scale were adopted from CanMEDS Teaching and Assessment Tools Guide (Gover et al., 2015).

3.6 ANALYSIS OF POSITIVE COMPOSITE CORE COMPETENCY SCALES

The item numbers used to generate the positive composite scales make use of the corresponding item numbers reflected on the questionnaire (cf. Appendix A).

3.7 ENSURING THE QUALITY, RELIABILITY, AND VALIDITY OF THE STUDY

There are various views about the validity and reliability of data, and results related to the mixed-methods approach. Validity differs in quantitative and qualitative research, but in both approaches, it serves the purpose of checking on the quality of the data and the results. In quantitative research, validity means that the researcher can draw meaningful inferences from the results to a population; reliability means that scores received from participants are consistent and stable over time (Creswell & Plano Clark, 2007). These authors state that, in qualitative research, there is a greater focus on validity to determine whether the accounts provided by the researcher and the participants are accurate, can be trusted, and are credible (Creswell & Plano Clark, 2007). In this study, in order to ensure validity and reliability, and to maintain consistency, the identified questions on attributes and their domain outcomes remained the same for the semi-structured online interviews and the survey.

There are various views about assessing the quality of mixed-methods research. The researcher used the guide of Maree and Pietersen (2007) to choose terminology describing the quality of this research study.

3.7.1 Trustworthiness

Trustworthiness in a mixed-methods approach is described as “including for analysis and interpretation of all the topics that were covered by both the quantitative and qualitative aspects of the study” (Golafshani, 2003:597).

Indicators for quality research are dependent on the data analysis approach and purpose of the study (Mertens, 2010). Criteria for the trustworthiness of a study are based on credibility, transferability, dependability, and confirmability (Mertens, 2010).

The trustworthiness of this study was ensured by doing triangulation, that is, by using two data collection methods involving qualitative and quantitative techniques. The online questionnaire was piloted first, and experienced research staff in the research office in the school of medicine were consulted. The trustworthiness of this study was ensured through the selection of academic staff who had expert knowledge of the MBChB programme, according to certain criteria. Furthermore, the researcher made sure that the credibility of the study was maintained by adhering to the data management policy of the University of Bath and the ethics requirements of both institutions (University of Bath & UFS), and by including requirements of health departments.

3.7.1.1 *Credibility/ Internal validity*

According to Bowling (2002), an instrument is assigned validity after it has been satisfactorily tested and repeated in the population for which it has been designed. This type of validity is known as internal validity – compared to external validity – which refers to the generalisability of the research findings to the wider population of interest (Bowling, 2002).

Maree and Pietersen (2007) state that internal validity refers to an accurate presentation of a particular context or event as described by the researcher. De Vos (2005), however, describes credibility as an alternative to internal validity and states that the goal of credibility is to demonstrate that the research was conducted in such a manner as to ensure that the subject was accurately identified and described.

In this study, the subject of the study is grounded in a theoretical framework that was presented in Chapter 2. In addition, validity was established further through the expertise

of the participants, as well as by the supportive expertise that the promoters and the statistician provided to the researcher.

3.7.1.2 *Transferability*

Transferability in qualitative research refers to the ability of the reader to be able to make judgements about the applicability of the research findings based on the research aims and objectives (Guba & Lincoln, 2005; cited by Mertens, 2010).

In this study, transferability was achieved by triangulating data sets from qualitative and quantitative methods. Multiple sources of information can be used to strengthen the transferability of research findings (Creswell, 2014). In this mixed-methods case study, multiple sources of information were consulted, namely, academic staff and medical interns, as well as information from analysed MBChB documents.

3.7.1.3 *Data quality (reliability/ dependability) and objectivity/ confirmability*

The term reliability is used in quantitative research, and dependability is used in qualitative research (Patton, 2002). Reliability is defined as the "stability or consistency of a measurement" (Delpont, 2005:163). De Vos (2005) indicates that dependability and reliability refer to different sets of assumptions that do not measure exactly the same aspect and instead refer to two separate but related aspects.

In order to increase the reliability of the questionnaire used in this study, the constructs were clearly defined, and care was taken to ensure that the questions reflect the different constructs. From a qualitative point of view, the aspects related to dependability used both quantitative and qualitative questions in order to enhance the quantitative data and to incorporate perspectives that could lead to a more holistic picture (De Vos, 2005).

De Vos (2005:346) indicates that confirmability refers to the question of whether the "findings of the study could be confirmed by another". To provide a more objective viewpoint in this study, triangulation of two different data sets was done (quantitative & qualitative data).

The literature review in this research was used to, furthermore, establish a well-constructed questionnaire. It was carefully piloted and reviewed by experts in this area of research.

3.7.2 Openness

The researcher was open to different views – not only the views of the academic staff completing the interview but also the views of the medical interns who completed the online survey. Fossey et al. (2002) state that evidence of seeking different views suggests the researcher's openness.

3.7.3 Authenticity

According to Fossey et al. (2002), authenticity in research can be established by presenting the views of participants in their own words, including verbatim quotes, when presenting findings. Quotations and participants' own words (or modifying the words but keeping the meaning) of the academic staff in this study will be included in Chapter 4.

The researcher checked the data analysis by reflecting on the interviews and verifying them against the interview transcripts. The interview transcripts were checked for accuracy by the researcher listening to the audio recordings (mp3 files) and comparing them to the transcribed text.

3.8 ETHICAL CONSIDERATIONS

Ethics is commonly known as a set of moral principles, aspects, or beliefs governing what is good and bad (Merriam-Webster Online Dictionary). In the research context, ethics focuses on what is morally right and wrong when participants are involved (McMillan & Schumacher, 2010).

Ethical clearance is required by researchers to protect the rights, dignity, and welfare of research participants. Furthermore, ethical approval is required if individual-level information is to be collected. To obtain ethical clearance, the proposal for this study was submitted to the Social Sciences Research Ethics Committee of University of Bath, which issued ethics reference number S20-068, and the Health Sciences Research Ethics Committee of UFS, which issued ethics reference number UFS-HSD2020/1420/2710. Permission to conduct the study was sought through the National Health Research Data registry 202009_009, nine provincial health departments, and accredited health facilities where medical interns were allocated.

Participation in this study was voluntary, and each participant was free to withdraw their consent and discontinue participation at any time without penalty or having to provide reasons. All participants were expected to sign informed consent at baseline (cf. Appendix D) and to consent to audio recordings being made (cf. Appendix E), and all data was anonymised.

Participation on an online survey implies consent; therefore, a manual consent form was not necessary, as the consent was done online. To avoid conflicts of interest and to promote an atmosphere of openness and transparency, a research assistant was appointed to interview members of staff, since the principal investigator was involved in the management of the school. The interviewer was a retired professor with a qualification and experience in qualitative research. In light of the COVID-19 pandemic, universal health and safety precautionary measures were adhered to. Candidates had two options for interviews: either participating in an online interview that was audio-recorded for quality control or participating in a face-to-face interview while observing universal World Health Organization protocols and guidelines for COVID-19 infection prevention and control. The online platform that was used is the one recommended by UFS, namely, Blackboard Collaborate, for staff and students, which is secured by UFS's ICT services. Participants preferred to conduct interviews online, signed the consent forms beforehand, and sent them by email. In this study, all interviews were conducted online.

Furthermore, the interviewed participants were provided with the opportunity to ask questions, they were given adequate time to think about questions, and they were not pressured or induced to participate. All data is stored in a secure place and will be treated confidentially.

After-care was offered to participants after the study was completed. Participants would be able to access the results of the research via the library or journal publications. The principal researcher undertook to invite the interviewed participants, at the end of the research, to formally present the results to them. No personal identifying information appears in the final report or in publications.

3.9 THE RESEARCHERS' EXPERIENCES WITH THE RESEARCH APPROVAL

The approval process is an intricate process that requires applications and approval from multiple stakeholders. The experience of getting ethics approval involved two application

processes: one through the University of Bath Social Sciences Research Ethics Committee, since it is the university where the researcher was registered for doctoral studies. The study, however, needed to be conducted in South Africa, in the UFS Faculty of Health Sciences; hence, an application was submitted to the UFS Health Sciences Research Ethics Committee. Both these processes had their unique requirements and processes, which were not aligned. This affected the researcher's expected timeline for the approval process. According to the timeline of the study, it was expected that the ethical approval process would be finalised by July to August of 2020, but it was only finalised in September/October of 2020. The UFS Sciences Research Ethics Committee approved the application first, but the study could not be conducted without approval from University of Bath.

After ethics approval had been obtained both from University of Bath and UFS, the researcher needed to obtain permission to conduct the study from health facilities across the country, where medical interns were stationed. This was a tedious and enormous task, as approval had to be obtained from the national and provincial health authorities, and health facilities first. This process was an online process through the National Health Research Directorate and was managed by individual provinces. Each province had its own guideline on how to implement its policies. This process was, furthermore, managed by each facility where the research was to be conducted. Each institution had its own guideline and policies. One central teaching and training institution – the one with the largest number of interns – in Gauteng province demanded that each research study conducted at their facility had to be approved by its own ethics committee. This was a rather unprecedented requirement, which led to further delays. To circumvent all these challenges – delays and discrepancies from province to province and between health facilities – the best option within the ethical codes was to use the UFS alumni database through undergraduate programme management to launch the study. This proved to be successful, as the researcher was able to meet the envisaged deadline of November/December 2020 to conduct the online survey among medical interns.

The frustrations experienced with obtaining permission to conduct research at provinces and health facilities were communicated to the National Department of Health Research Directorate unit.

3.10 CONCLUSION

In this chapter, the framework for the research was reviewed, and the three main research

components were examined, namely, the research paradigm, research design, and research methodology. Finally, the integrity of the study, validity and trustworthiness, as well as ethical considerations and approval processes that applied to the study were described.

3.10.1 Limitations of the research study

Since this is a mixed-methods single case study that involved the UFS medical school as a South African example, it is important to avoid generalising the findings of the study. It is also important to note that UFS is the only medical school in South Africa that offers a five-year medical programme – all other medical schools offer six-year programmes. The results and recommendations emanating from this study offer transformative pedagogy for the development of curriculum at the UFS; however, the study offers a unique contribution applicable to UFS and not necessarily to other universities in the country. Nevertheless, other medical schools and higher education institutions are likely to learn and benefit from this study.

The timing of the study and the impact of COVID-19 might have had a bearing on those interested in participating. Considering the relatively small number of interns who participated in this study, inferences should not be drawn about the whole population of medical interns who studied at UFS. The interviews and survey were conducted close to the holiday season of December/January 2020/21 and around university recess, which might also have had an impact on participation and data provided.

The use of the external research assistant to conduct semi-structured interviews may have created some bias, as the researcher was an expert in curriculum studies. However, the bias was mitigated by allowing the use of the standardised interview guide/questionnaire to interview the educators (*cf.* Appendix B). The educators were also not having the background of the external research assistant and the participants response were anonymised and blinded to the researcher.

The next chapter will present the research findings obtained through the implementation of the research design and methodology described in this chapter. Chapter 4 will present the results of the document analysis and information gathered through the semi-structured online interviews with academic staff. Chapter 5 will present the information gathered from the online medical intern survey.

CHAPTER 4

PRESENTATION AND ANALYSIS OF RESEARCH FINDINGS: DOCUMENT ANALYSIS AND INTERVIEWS WITH EDUCATORS

4.1 INTRODUCTION

In presenting the study results, it is important to align the results with the research questions, aims, and objectives. The aim of this study was to develop guidelines to evaluate the implementation and assessment of the AfriMEDS GAs in the UFS MBChB programme. The study results will be presented in three parts, namely: 1) Document analysis: HPCSA 2017 accreditation report analysis and phase guides analysis, 2) Feedback from educators, and 3) Results of the intern survey (the latter will be presented in Chapter 5).

As explained in Chapter 2, under the critical evaluation of the UFS MBChB programme concerning the assessment of AfriMEDS graduate competencies (*cf.* Section 2.4.2.3), the following questions will be answered by the study findings:

Does continuous assessment of students comprehensively cover all eight AfriMEDS competency roles in terms of both knowledge and skills? The AfriMEDS medical expert is the integrating role with an exit-level outcome and the necessary role that the medical student is expected to acquire in order to be admitted into supervised internship training; thus, it is included at a later stage of the results. The following questions are, therefore, relevant:

- i. Is the assessment balanced, and does it cover all aspects of the AfriMEDS framework?
- ii. Is the assessment integrated or divided?
- iii. Does the assessment promote interdisciplinary cooperation and collaboration in teaching, training, research, and practice between healthcare workers, and does it promote interprofessional collaboration?

The mixed-methods approach used in this study involved data triangulation, as explained in Section 3.1. Document analysis of phase guides, accreditation report, rule books, and workshops was done. The structure of the MBChB undergraduate programme was outlined in Sections 2.10; this conforms to the rule book, and as it was presented in the workshop, it will not be covered here. Only the HPCSA accreditation report and phase guides will be

elucidated upon.

4.2 DOCUMENT ANALYSIS

Themes were identified by employing triangulation of data from document analysis of phase guides, interactive semi-structured interviews with module leaders and faculty members, and an online questionnaire from the intern survey.

Following document analysis, main themes (with various subthemes) emerged from the data to support the research question as presented below.

4.2.1 HPCSA accreditation report 2017 analysis

The accreditation report of 2017 is appended as Appendix K. In this section, only matters related to teaching and learning will be highlighted, as they relate to the assessment of GAs as part of the AfriMEDS competency framework. The following points were raised as matters of concern in the HPCSA accreditation report of 2018, under Recommendations:

- a) *“Sesotho training should be formally introduced in the curriculum in the Faculty to enhance student-patient communication”*(Recommendations: (e) & A.1.5:7).
- b) Increasing interaction and greater use of the platform for interprofessional learning (Recommendation (g) pp, A.1.7:7; 4.10:2).
- c) The phase reviews of the curriculum should be formalised and feedback given to the faculty (Recommendation (l)).
- d) Expansion of community-based educational activities (B.2:11, Recommendations (h) & (i)).
- e) Developing a parallel course to assess suitability for student selection and admission to study medicine as an option without disadvantaging new admissions through the LDP (4.1).
- f) Increasing student numbers and staff (A.1.14:11; 4.6).
- g) Consistency in assessment needs to be ensured (4.9:2).
- h) There is no opportunity in the curriculum for students to experience continuity of care, and primary care rotations are mostly fairly short (4.9:10).
- i) Development of a longitudinal integrated programme in a number of sites for a small number of students (4.10:2).

4.2.2 Phase guides document analysis

It was explained in Chapter 2 that the UFS MBChB programme is divided into three phases (I–III, cf. Table 2.4). The phase guides include module structure and learning outcomes.

The phase guides (I–III) were analysed using major themes, and the results are tabulated in Table 4.1, which gives the number of times core competencies were mentioned in the phase guides and methods of assessment used.

Table 4.1: Comparison across Phases I–III guides and LDP guide on the number of times core competencies were mentioned in the phase module guides

CORE COMPETENCIES	PHASE I	PHASE II	PHASE III	LDP
Communicator	10	10	3	6
Collaborator	12	1	1	12
Professional	15	7	1	1
Scholar	5	0	1	4
Leader and manager	5	0	1	5
Health advocate	0	0	1	0
Community-based education	6	32	6	1

Notes: LDP=learning development programme

In Table 4.1, it is clear that the core competencies of health advocate, leader and manager, and scholar feature less prominently across all phases, compared to the competencies of collaborator and communicator, which feature fairly strongly, and the competency of professional, which features strongly in Phase I. On the other hand, community-based education features strongly in Phase II. In the LDP, which is the remedial programme (cf. Section 4.2.2), collaborator features strongly and is followed by communicator. This is not unusual for collaborators and communicators to feature strongly in the LDP because the learning outcomes are geared to address communicator and language skills, and intra and interpersonal development.

Table 4.2 gives an overview of the way AfriMEDS graduate competencies are assessed in the UFS MBChB programme in comparison to methods recommended by the CanMEDS assessment tools handbook (cf. Appendix M).

Table 4.2: Core competencies and methods of assessment

CORE COMPETENCIES	ASSESSMENTS				Recommended Assessment Tools (CanMEDS) (++++)
	Phase I	Phase II	Phase III	LDP	
Communication	Portfolio, MIMA case tests, Community Service-Learning assignments	OSCE Community practical	Clinical case	Continuous evaluation mark, Work assignments, Student portfolio, Reflective report	Direct observation & ITER OSCE/SP Multi-source feedback
Collaboration	Community service-learning assignments, Blackboard	Community service-learning assignments		Summative & formative assessments, No exams	Direct observation & ITER OSCE/SP Multi-source feedback Simulations
Professional					Direct observation & ITER Portfolio
Scholar	Research, Portfolio, Tests			Summative & formative tests	Direct observation & ITER Portfolio
Leadership and management	Core summaries, Presentation, Apply theory				Direct observation & ITER Multi-source feedback
Health Advocacy					Essays Direct observation & ITER Multi-source feedback Portfolio
Community-based education	Community service-learning assignments, MIMA case tests, Written tests	Workbook assignments Group work	Logbook, Group tasks, Assignments, OSCE, No formal test or examination, Attendance, Case studies, Digital story, Mark by the supervisor after each 2nd week rotation		[Assessed as part of Medical Expert] Written test Oral exam Direct observation & ITER OSCE/SP Simulations

Notes: ITER = In-Training Evaluation Report; SP = simulated patient

Table 4.2 shows that the tools of assessment used in the MBChB phases are not in line with the recommended tools used to assess the CanMEDS (AfriMEDS) competency framework (*cf.* Annexure J).

The discrepancies noted are that communicator and collaborator roles in the phases are misaligned with the CanMEDS best recommended tools used to assess these roles, while in the LDP, communication is closely assessed in line with the CanMEDS recommended assessment tools. Professional and health advocate role assessment tools are not mentioned in the phase guides of the UFS undergraduate medical programme. Assessment of scholar, leader, and manager roles seems to be rudimentary, as they are not mentioned across all phases or in the LDP and are not aligned with CanMEDS assessment tools. Communication in the LDP seems to be better aligned with the CanMEDS recommended assessment tools; this is because communication is one of the main learning outcomes of the LDP programme.

4.3 FEEDBACK FROM EDUCATORS

To evaluate the implementation and assessment of the AfriMEDS graduate competencies in the UFS MBChB curriculum, it was necessary to scrutinise learning outcomes, learning and teaching events, and assessment. This was achieved through virtual semi-structured interviews with 15 faculty members, which took place after all ethical considerations had been observed and informed consent obtained, as explained in Section 3.6 (*cf.* Appendices B-E). The semi-structured virtual interviews reviewed the effectiveness and relevance of SACMBE GAs, explored alternative models of GAs, and proposed recommendations regarding the way forward. The data gathered in the process of interviews will be outlined in this section.

Tables 4.3 and 4.4 give the profile of educators who participated in semi-structured virtual interviews in terms of their involvement in the phases of the MBChB programme and their roles. Table 4.4 explores whether faculty members consider AfriMEDS GA domains being included in the training.

Table 4.3: Involvement of educators in the different phases of the MBChB programme

PHASES	FREQUENCY	PERCENTAGE
Phase I	0	0
Phase II	2	13
Phase III	7	46
Phases II & III	1	6
All phases	5	33

As Table 4.3 shows that, there were no educators who taught in Phase I only. However, there were 5 who taught in phase I and taught in Phases II and II as well.

Table 4.4: Role of participants in the programme

ROLES	FREQUENCY	PERCENTAGE
Module leader	6	40
Phase chair	2	13
Teaching and learning/Supporting coordinator	5	33
Programme director	1	6
Retired professor of Clinical Medicine and Surgery	1	6

Data in Table 4.4 indicates that the majority (n=6; 40%) of participants in the semi-structured interviews were module leaders who are also educators.

Table 4.5: Competency included in modules

COMPETENCY (n=15)	YES n (%)	NO n (%)	NOT SURE n (%)
Collaborator	13 (86)	0	2 (13)
Communicator	14 (93)	0	1 (6)
Scholar	14 (93)	1 (6)	0
Leader and manager	8 (53)	4 (26)	3 (20)
Professional	15 (100)	0	0
Community-based education	11 (73)	3 (20)	1 (6)
Community-based medical education	10 (66)	4 (26)	1 (6)

Table 4.5 highlights that four (27%) of the participants did not agree that leader and manager are core competencies, and CBME competencies are included in the curriculum, while three (20%) did not agree that community-based education was included. However, three (20%) participants were unsure whether the leader and manager competency was included in the curriculum. Thus, the domains of leader and manager role, CBME, and Community-Based Education are areas of concern.

4.3.1 Qualitative: Findings/Results

A total of six key areas of interviews and twenty-six themes emerged from the analysed

data and are presented in Table 4.6. Relevant quotations from individual participants are used to support the themes.

Table 4.6: Key areas of interviews and themes

KEY AREAS OF INTERVIEWS (n=6)	THEMES	NUMBER PER THEME (n=26)
Assessment of competencies	No formal assessment Presentations Report writing Summative assessment	4
Challenges	Clinical assessment Lack of communication between teaching and learning departments Limited assessment COVID-19	4
Gaps	Lack of assessment tools Lack of clinical exposure	2
Best practices	Assessment tools Assessment policies and accreditation requirements	2
Needs for effective assessment of students	Electronic platforms More staff Standardised assessment tool Training	4
Support required from management	Assessment training Electronic resources Continuous feedback Governmental support Intersarsity collaboration Quality control More staff	7

Table 4.7 shows the number of times a key area of interview was cited during the individual interviews. The key areas of interview were cited 283 times in total. Assessment of competencies was mentioned the most, at 46% of the time. The least cited key area of interview was best practices, at 8% of the time.

Table 4.7: Number of times the key areas of interview were cited

MAJOR THEMES (n=6)	NUMBER CITED (n=283)	PERCENTAGE (%)
Assessment of competencies	130	46
Challenges	40	14
Gaps	26	9
Best practices	25	8
Needs for effective assessment of students	27	9
Support required from management	35	12

4.3.2 Assessment of competencies

Table 4.8 gives a detailed response from educators based on the questionnaire on assessment of competencies, followed by summarised excerpts on each of the sections of the questionnaire as in Appendix B.

A list of the way competencies were assessed included different forms of presentations, report writing, and summative assessment. However, members of the school of medicine reported that it was difficult to teach and assess competencies that required soft skills. In relation to the way soft skills were assessed, the absence of formal assessment mark allocation was most often reported. Even though there is some informal assessment concerning most competencies, it was however noted that no formal assessment was cited in the following competency roles: collaborator, communicator, leader and manager, professional, community-based education, health advocate, and with the scholar competency showing some formal assessment in group work and in summative assessment.

There's no formal assessment mark allocated to students for being good collaborators, although they are involved in collaboration, they are not formally assessed on it in our module.

I don't think there's any formal assessment of leadership.

Table 4.8: Key Theme(s) based on the questionnaire to educators

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
Assessment of competencies	How the competencies are assessed	Extracts from participants' responses
Collaborator		
No formal assessment	It is part of formative assessment but no formal assessment mark allocation	There is no formal assessment mark allocated to students for being good collaborators, although they are involved in collaboration, they are not formally assessed on it in our module. We don't really incorporate that into our modules, directly
Presentations	Video presentations	They also need to do a video, then they do a presentation
Reflective report	Written and oral reporting	They've got a whole module where they need to work together in the interdisciplinary teams with all the other departments, as well as in small teams, and as well as when they go to the in the community, they work with the nursing professionals mainly but also with other allied health workers. So, they need to write reports on that, and we mark the reports on that. For instance, now with a collaborator, it will be the group work specifically, so the group work requires them to work in a group to resolve a problem. And then, within the reflection report, you then read as to what the student took from the session.

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
Teamwork	Continuous group work with fellow students or interdisciplinary during clinical rotations, research projects	The MHAЕ, as well as the METH modules, have specific focus on working in teams. For example, the students are assessed, and they will get a group mark, as well as joint marks for collaborating. The same for the MANA; the students also work in a group. They've got exposure during ward rounds to the multi-professional team, and in clinical case presentations. They must involve the multi-professional team members, the appropriate members in the management and treatment of the case. With the collaborator part, we have a lot of group set-ups where I also look into the personalities, and then I group them on basis of who are the introverts? who are the extroverts? who contributes? who's quiet? And then as time goes on, I rotate them to move from. If you are an extrovert, I would put you into a group where you are challenged with the other bunch of extroverts and if you are an introvert, I would take you out of your comfort zone and put you into a group of extroverts. We will often put them in scenarios where they as a group, must plan a strategy for a patient under that we even encourage him to make use of the other disciplines like physiotherapy and occupational therapy and what-not.
Tutorials	Form of communicating to fellow students and teachers	I induce collaboration by encouraging students to seek opportunities to communicate with teachers during and after official communication or contact time. Hence, we have Saturday tutorials where those that may want to improve their performance come for extra tutorials where we can deal with their own concerns and deficiency that they see in their learning and their knowledge base
Communicator		
No formal assessment	It is a form of formative assessment but no formal assessment mark allocation	They are taught the skills, but according to my experience, they were not assessed. We don't really, give them a mark on how they communicated with the patient.
Interactive communication	How students are engaging with those they communicate with	Everyone must give an opinion when we are in discussions and obviously at the bedside, we do that as well. We also have an engaging session. Let's say we have five hours in a week, two hours is set out for where we engage. When we see if somebody is now able to express themselves and can, you know, integrate the content. It's not a form of assessing apart from the oral, as well as the written part it's just to see progress in the student's development of skills when it comes to communication. We do try and emphasise to them the importance of diversity. We put a lot of effort to include city and Afrikaans phrases in our teaching, as well, to help them when they are actually able to the community that they are able to communicate and to understand that they are to manage their cultural and language barriers.
Oral assessment	Continuous assessment during rotation by taking patient history, giving feedback to the patient	They are assessed in terms of their ability to take history from a patient and to elicit the necessary information from the patient as well as to feed back to the patient and any plans for the treatment and management of that patient when they are presenting in the ward. So that's kind of assessed continuously during the rotations as well as in the oral examinations at the end of the day rotations. In their fifth year, students, they receive oral examinations and that will also give them the opportunity to communicate with the specific examiner and also, they have to do a lot of interviews with patients and they have to collaborate about their diseases and before an anaesthetic. So, we teach them to communicate with their patient clearly so that they understand what the purpose of the anaesthetic is. Have specific outcomes related to communication, for example, breaking of bad news, which is a very important skill for a doctor to make clinical encounters with. So, that is assessed as part of the Family Medicine module. And

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
		that is done in a practical way by means of the clinical assessment or the OSCE.
Case presentations	Taking patient history exam with simulated patients; demonstrate how to conduct a discussion with a patient	Students are constantly asked to present patients on ward rounds and take histories and that's part of their formative assessment. But in the final year, we have a formal history and communication exam, which they get a mark for, and during which they must take a history and communicate with simulated patients. Demonstrate, and present to the lecturers, working in that environment, how they actually conduct a discussion with the patient and the, the final assessment on the clinical side is where they actually get a clinical case, and then is examined by two different examiners to see and observe actually how they interact. And what is their level of understanding. They are assessed in terms of their ability to take history from a patient and to elicit the necessary information from the patient as well as to feed back to the patient and any plans for the treatment and management of that patient when they are presenting in the ward. Especially assessed in the OSCE setting, where they must do history taking of patients and demonstrate with listening skills. And they also sometimes have patients where they must explain diagnosis to a patient.
Report writing	Written reports	In addition to the oral presentation, they also need to report the alternative - end of the year report which is the written communication aspect of things. We give them feedback on the written part, as well. Writing up reports, I mentioned the example of the project, and then students do as part of the general skills module.
Tutorials	Form of communicating to fellow students and teachers	In a tutorial session, everyone has to give an answer, even if it's the same question, because everyone is going to be a doctor, everyone must be able to speak for themselves and I can hear who is the parrot and who is the leader, among them? Because he gets an answer and then the other one says I agree with this one, then I can tell them that if two people agree on everything and one of the two is not thinking. This is to manifest or to induce responses rather than agreeing with the most intelligent in the group. Tutorial sessions, where they see the patients when they have people go and see patients and then we speak, they present their story in the Kines (lecture theaters) in front of their peers so that they learn to be courageous and to be able to communicate with clarity, and then we can both, from the student side, and from my side criticise the presentation to say, was it clear? Was it informative? Was it concise? Was it precise? It helps them with their own future presentation because everyone learns from the next person.
Community-based medical education		
No formal assessment	It is a form of formative assessment but no formal assessment mark allocation	Forms more of a role in primary health care. And it's difficult to include that in a module, which is more focused on secondary and tertiary care. And so, at the moment, we did not formally assess community-based education within our module. It would be something like, for example, teenage pregnancy, or substance abuse, or hypertension, you know, diseases of lifestyle, which agreed is a specific problem in communities in terms of health, which causes the students to learn how to advocate for help, how to advocate for prevention of disease, not just curing of disease, how to take the lead in saying, this is what we need to do in our community, to create awareness, to educate people, to give them the skills they need to try and prevent these diseases. They are mostly spending times with referrals for secondary and tertiary hospitals, so they're not really at a community level. However, they are expected to be able to engage with the patient in such a way that they understand where their patient is coming from and how that's going to affect the patient's management. For

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
		example, if they need to make dietary changes or lifestyle changes, they need to be able to facilitate that in such a way that they are aware of what's happening in the patient's environment at a community level. Although they are not necessarily in my modules and working at a community level. They need to understand what's happening at the community level so that they can convey appropriate management messages to the patient. So, I would say it's also a bit of an indirect assessment.
Not applicable	Community-based medical education is not done	At Internal Medicine we don't do the assessment in the context of the community. As I've said I don't work in a community.
Presentations	Video or oral presentations	For health advocate, I know that starts very early in the career when I started in phase 1, where they need to go out in the community and assess problems in the community, identify those problems. And then they get to community projects that they need to work on.
Reflective report	Written and oral reporting	We would ask them to write case reports, so a portfolio assessment, and in part of that portfolio is also reflection.
Community engagement	How community engagement is assessed	
Logbook assessment	Learning and assessing tool for students to keep record of their experiences	That is also part of the community-based education rotation where they've got the logbooks
No formal assessment	It is part of formative assessment but no formal assessment mark allocation	During the rotations, students are expected to participate in clinics and to interact with patients on the community level. However, there's again, no formal assessment. It's just something that's included. It is not formally assessed.
Not applicable	Community engagement is not done	We don't do a strong community engagement as the Family Medicine colleagues, because they are the first line in terms of access from the community. The committee can walk into a Family Medicine setting, but they cannot walk into a specialist setting, like ours. You cannot come to doctor by yourself, you need to be referred by someone. At Internal Medicine, don't do the assessment in the context of the community. Unfortunately, in Anaesthesiology, there is no real opportunity to go do community engagement because as an anaesthetist you need a hospital, you need surgeons
Presentations	Video presentations	It can be like in the MHAE, where they go out in the community, and they have a community study, they need to present and get full marks, so that is assessed. They do presentations, and they got to make videos.
Leader and manager		
Development of management plan	Students are asked to develop a management plan in the final-year clinical exam	When students do their clinical exams, especially in the final year, they are assessed on whether they can put together a plan, and come up with a management plan for a patient, and that is the only form of assessment we have.
No formal assessment	It is part of formative assessment but no formal assessment mark allocation	I don't think there's any formal assessment of leadership. Self-management and how to manage your time and how to manage your practice is one of the things they focus on in the METH, how to deal how to advertise your practice, for instance, how to manage your practice and things like that are strongly addressed in the METH, and also in the Family Medicine modules which follow in the Phase 3. I know that they focus very much on the doctor and medical, legal documentation certificates, management of the practice, and so on. So, they do that a lot of

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
		leader and manager things in that module. The leadership that one inculcates is assessed by giving them tasks on my side, and then see how they negotiate the tasks that they are given, but the ones that have that natural tendency to lead manifest both in the lectures by way of answering questions and preparing for the lectures and being able to engage even after the lecture. So that is natural leadership. The one that is induced is assessed by how they manage the tasks that they are given whether it is a research project, or it is an assignment, in theory and in practice.... go and see a patient come and present the code. If there are more than two people, then you will see that they organise themselves. One of them being the presenter and you can see.
Not applicable	Leader and manager not done	We don't really do anything there. I am not quite sure if we are really assessing these two aspects of the course.
Professional		
Case presentation	Taking patient history exam with simulated patients; demonstrate how to conduct a discussion with a patient	They get in their OSCEs and do their case presentations, do their rotations, we assess that. So, it's continuous assessment. The students get training in the clinical simulation and skills unit and we assess them using an OSCE. Questionnaire that consultants must fill in when they've completed a rotation, which offers marks for things like professionalism, the way they participated, the way they interacted with patients.
Logbook and portfolio assessments	Learning and assessing tools for students to keep record of their experiences	Throughout the rotations, students get to have a logbook, and it's documented in the logbook, whether they have any late arrivals or any instance instances of non-professional behaviour. So that forms part of our formative assessment. Again, there's no formal Mark allocated but there is there is a record of it as part of formative assessment on an informal basis. There is also a place where the lecturer makes comments on this professional portfolio of a student. And then at the end of the MANA, all students now have this professional portfolio. We hand it over to the MCLI that's the CQ skills. We ask students to write down an assessment situation on how do they assess a patient, they hand in a portfolio and then they must reply in the response on this portfolio how they manage, to find out, and in the way that they're conducting their portfolio, one can see the situation about professionalism.
Professional appearance or conduct	Demonstration of professionalism and good conduct	When doing oral stuff, you can see the person's conduct, how they present themselves, first, how they come through that professionally and then how they present themselves and what they present, the content. So, it is conduct and the content they are assessed on. Their professionalism we assess when they present in the wards and in the clinics, we give them a mark for their conduct in the wards, and then also during the oral examinations, we assess their professionalism and how they behave in the oral examinations. They get marks for that professional appearance. On the aspects of coming late, they know if they don't dress properly or they don't talk properly with staff or things like that. So, it is taught to them but they get very limited degree marks.
Research report	Written and oral presentation	A formal oral presentation, almost like you would have at a research conference, so the students in a group get an opportunity to present their research in front of the class. This is assessed by a panel of judges who are lecturers, and that makes use of a very specific rubric. And then the students choose some winners that go on in the faculty to present at the student research forum.

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
Scholar		
No formal assessment	It is part of formative assessment but no formal assessment mark allocation	We don't have a lot of involvement there, because they mostly do that through the MSSM module they're all involved in a research project that they must do over the phase two. So, they mostly do it in the MSSM module is not necessarily as part of the clinical skills module. So, we do not assess that, and they're not assessed.
Oral assessment	Continuous assessment during rotation by taking patient history, giving feedback to the patient	I think that review usually comes in exactly in the fifth year again, where they do a lot of oral assessments. And it goes also to the assessors during the fifth year are different people and they all have got this added different attitudes towards the students and through that also it assesses knowledge, the gaining of new knowledge. They had a simulated case, just give them a photo of, say, a patient with jaundice, then they look at the photo of a patient with jaundice and then we would ask them questions about how they will know and manage that problem. And that would be 100% of the mark would be based on no patient contact at all. Oral presentation in class that is assessed by their peers. The students get training in the clinical simulation and skills unit and we assess them using an OSCE.
Research report	Written and oral presentation	A research study, they need to do and they can do it on whatever they are interested in, but it can be in the clinical situation, sometimes it's something being in the clinical wards they are interested in, it's something like at the moment in dissection. As expected in undergraduate research with the students is to help them understand how the knowledge that they are consuming was generated. Scholar has to do with research activities. A formal oral presentation, almost like you would have at a research conference, so the students in a group get an opportunity to present their research in front of the class. This is assessed by a panel of judges who are lecturers, and that makes use of a very specific rubric. And then the students choose some winners that go on in the faculty to present at the student research forum. I better get into my research project that they are given, whereby their scientific reasoning and more like the critical thinking, or the critical comprehension of the scientific writing takes place in how they formulate the scientific report in terms of the differences in text. Also, the bibliography, and so on.
Theoretical paper writing	Assessed on theoretical and written papers	I think that's probably the best assessment of the scholarship. The theoretical and written papers that they write in the third, fourth and fifth year. We test them quite high up on Bloom's taxonomy they need to be able to take the information that they've received, and they need to integrate it themselves, and also going externally. And looking at articles to improve the knowledge.

Barriers and/or challenges identified or experienced with regard to using assessment tools in the teaching and learning environment

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
Challenges		
Benchmarks for grading	Lack of guidelines for benchmarking and objectivity	I think what we have identified, though, is that when we look at, you know, give marks we haven't got all the elements as a point to know when we do this sort of interview so the impression of how the students perform is based on the experience of the examiner. And that might vary you know. You know that the assessment tool is perhaps not as comprehensive as we would like. And we are at the moment, in the process of reviewing that the utilisation of the assessment tool. You know how it's interpreted by different levels of experience I think might be a

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
		<p>problem. There is obviously examiner variance you know so one examiner might be satisfied with the level of professionalism that another examiner is not, for example. It's a bit more of a subjective judgement for the assessors in the OSCE, for instance, does the person look professional or did they take their shirt from a washing machine? Note that we don't have a 10-point scale of, you know, on what is professionalism. These things are sometimes very difficult to formally define. If we have the students in the workplace or in the clinical environment, I think that places them where there are challenges in terms of this assessment in the workplace or in the clinical environment, because something like communication or collaboration are also to some extent regarded as soft skills. And those are slightly less clear to define exactly or to grade exactly.</p>
Clinical Assessment		
Artificial, subjective, and unfair	Clinical assessments are artificial, subjective, and unfair	<p>It's very challenging to make a clinical assessment, which is objective and fair. And, you know, I think the best way to get a clinical assessment that's objective and fair is to give students multiple opportunities, maybe include more clinical cases. They give you an imaginary scenario that everybody must talk and then they check your interaction. And when it's not authentic, it can be very artificial to try and say this is the real leadership skill. I think it is best assessed when they're actually doing the practical because something like a 360 feedback from staff, not from the administrative staff and the other health professionals, because people can put on a very nice picture if they know that they are watched.</p> <p>In the clinical skills module, we do training of, especially, communication professionalism and health advocacy. And those aspects are usually assessed in an OSCE. But the problem is an artificial situation, so the students know that they are being assessed on. So, in my opinion, they are trained to do that, because I know they are being assessed on that. So sometimes I think it will be better to assess in the workplace. They understand and they know that this is a mannequin is not a real patient. So, teaching on real patients is the crux of training an excellent or a good Anaesthetist.</p>
Shortage of patients for practicals	Patient numbers are dwindling for practical purposes	The patient numbers are also dwindling so it's sometimes a challenge that there are not enough patients for the students to examine
Shortage of staff	Lack of staff	<p>Time and personnel are the two challenges that we face today that are limiting us. So if we could have more staff. The greatest difficulty is the numbers of students, and the ratio between the teachers and the learners because the, you know, we have 176 students and to assess each one of them individually in terms of GAs is difficult, because the ideal would be to assess them when they're actually in the clinical environment, an authentic environment.</p> <p>It would be good if you could observe each student individually with the patient but again it's very difficult to get that ratio where you put one to one provision. We usually got three or four of us you know, with 30 students for the observation of each one individually to give them some feedback.</p>
Simulated patients are expensive	Lack of funds for simulated patients	We use a lot of simulated patients for training as well as for assessment and becomes very expensive because we have to pay them. So, from a management position, it is costly to have simulated patients. What's happening these days is patients are being paid for participating, and this is an issue.

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
Communication between teaching and learning	Lack of communication between teaching and learning coordinators and clinical staff	The problem is that the teaching and learning coordinators usually will address the students, or we'll get the marks, and two of the people on the clinical platform, they're not at the same place because one is at Pelonomi or National hospital or Universitas, not necessarily with the teaching and learning coordinator. And then, there is a little bit of a lag, or a lapse in the time frames for somebody will address a student on something, and two weeks later reports to the doctor, then the student is not there anymore. And the clinical people don't necessarily attend to these things. They say, it is serious, I will do that but otherwise I will not, necessarily. Preparation by the surgical departments, not properly preparing a patient from their side. If the staff in the ward didn't have a good vigilance over the patients and they have eaten before the operation, within a certain period of time, we cannot do the anaesthetic we have to cancel that case. So practical, and things that happen in the ward or in other departments might have an effect.
Continuous assessment tool	Lack of continuous assessment tool	Difficult because it's continuous. it's not something that you do sometimes, and sometimes you do not, until you need to test, that it's something that must be there all the time. Every time when you engage with anybody. So, we plan to have a continuous assessment tool where everybody can write on the same tool that we do that continuously and per assessment. Continuous, with a logbook per student. So that, if there is any conduct or problems in communication that we can identify from the first year, and to work with the logbook and address that and see students improve.
Limited assessment	Lack of comprehensive assessment	Expand our assessment, we would include more assessments, which would look at collaboration, professionalism, communication, and leadership. And so, yeah, I think those attributes, and would be nice to assess on a more formal basis. And it is difficult to do so at the moment because of barriers. It is a bit of an artificial environment to do this assessment during their practicals and during their OSCEs. Communicator once again we can assist them in terms of the storytelling and explanations, but we did not get very deep in terms of the communication skills, really exploring challenging patients or breaking bad news or any of those more in-depth communication skills.
COVID-19		
a. Ethics	Examining the same patient for assessment undermines ethics	The limits on the number of patients, you know, one of the challenges is obviously an ethical situation of, are we going to use the same patient for all 32 students to examine the same patient or that we're going to examine a different patient for their assessment purposes.
b. Infected students and personnel	Infections led to online training and assessments	What happened now with the COVID, is that there were extreme pressures with the clinical settings for the students doing deliveries, that is, on the ability to have that chance to deliver without the risk. Because at that stage the fourth-year students work under the direct supervision of a midwife, and we had large numbers of the midwives that were affected. The supervision was adversely impacted. What we did in that period, they were limited, there was a shift to more online, sort of, training, and giving them sort of case scenarios which they needed to work through. People now suddenly needed to go into quarantine. That impacted on the assessment processes, we for example, we had a fifth-year student. Just before the type of case assessment and the MCQ test, had to go in quarantine. And we were then able to shift that case to an online case. So we loaded exactly the same case online which the student completed online during the same time the other people wrote their class test, and

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
		the oral (assessment), we actually did manage to do it on Blackboard where the examiners and the students were communicating as we are communicating now. I think the disadvantage of that is we can't properly assess the body language and so on during the oral. But that was then an extremely good alternative to continue with the assessment, despite the challenges.
<i>c. Lack of face-to-face assessment or simulations</i>	Physical interaction is neglected	Because normally, we say a student has two textbooks. One is written textbook, the other one is a patient. so, at the moment under COVID is a limit to that percentage of 50:50 textbook, both patient and written stuff is going more in the favour of the written part. At the moment, we're using more of the fourth industrial revolution instruments, like the simulation lab, where we listen to the heart sounds. And then, we practice the resuscitation on the mannequins, and even now the exams that we do, the so called OSCE exams, a lot of them are not live like we used to in the past, we used to have nine patients with the symptoms or the sign that we want them to find. Now we use fewer patients and more mannequins for the lung pathology and for the masses in the abdomen. So it is not exactly the best that we could do. But it is the safest, doable best at the moment, our training and testing at the moment, are not optimal. I missed out that human contact with the students, this year. Exposure to patients was diminished this year and they could see it, having an effect on the clinical skills. And there's lots of other little skills and things that the consultant does that you notice an expert do which no textbook tells you about. A lot of the wards were closed and changed to COVID wards. So, a lot of our division actually closed during the course of the year that has effect on the number of patients I can see and then secondly what was happening is, you know, with a social distancing you can allow fewer students. You take turns in coming into the room to see the patients and it makes it difficult. If you want a consultant to maintain social distancing. And there are people who are of the opinion that everything can be done electronically. And I think the human and the interactive aspects are totally neglected on those platforms. Because of the social distancing and because of the even less manpower, just doing the important things. It's becoming, I don't want to say a dying out skill, but this skill is not being practised sufficiently to assess these things. I think they've been neglected; they've pulled the shorter state. And then, the assessment of these things has taken a turn for the worse.
<i>d. Limited practical assessment</i>	Limited opportunity for practicals	In our subject, Anaesthesiology, you need theatres, you need surgery, and where your patient or where your student can be assessed. And very often, our surgeon/surgeries or surgery theatres are cancelled and then students get no opportunity. For instance, I can refer to the pandemic where our surgeon totally cancelled theatre assessments or the attendance. And instead of two weeks in the force here, we only had a possibility of one week, the same with the fifth year. So that's the availability of practicals.
<i>e. Online assessments</i>	Effects of online assessments	When the lectures are online, the biggest disadvantage of the online lectures, to me, is this that you can't see the body language, because when I lecture and I see the body language saying to me they don't understand. Surely there are some online assessment tools we haven't really rolled out to the potential they have. I'm thinking about journals or apps, or blogs, things like that. We also learned as students learned. We learned how to help them to upload things to work in the online environment. A lot of teaching took place. We had to revise our assessment models quite a lot because of the pandemic situation, so we've

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
		<p>been doing a lot of online assessment and written assessment. The quality of knowledge has gone down. It's not the same as direct contact and direct interaction with patients. And I think this year with the sudden switch or transition to more online or blended learning is also giving us a fresh challenge in terms of how we can address and assess these competencies.</p>
Authenticity of online assessment	Authenticity of online assessment is questionable	<p>I couldn't have a lot of group activities at all. The only time we could even have group activities is when we introduced WhatsApp. You create a WhatsApp group, and now we go into this. Because you also need to keep the social distancing but again how effective is it? and then they pointed out when the reported benefit. My last emoji is a lol, something - laugh out loud. And then I would say, were you laughing? They were like, "No, I just said it." So, do you see that? even the communication platform was not necessarily authentic, because you said lol, but you were not laughing.</p>
Positive impact	COVID fast-tracked the strengthening of online platforms	<p>COVID had a major effect in the whole approach and in fact assisted us to transform in a positive way. Emergency remote teaching and learning, have transformed into a true blended environment, where we are actually going to take forward, in any case, all the things we've learned about engaging with our students in the online environment, and also about assessment, obviously. Before COVID, assessment was established face-to-face, assessment and COVID helped us to develop online assessment.</p>
None	There are no challenges	<p>I haven't had any challenges with it. It's a working tool. It works very well specifically in the portfolio.</p>
Lack of resources for practicals	Unavailability of resources hinders practical sessions	<p>I would say, lack of resources to conduct proper clinical exams. In psychiatry it is very time-consuming. We need to come up with innovative strategies to examine. We also don't always have the appropriate patient population available on days of exams. (We have) to work with what patients are available on that day. In our subject, Anaesthesiology, you need theatres, you need surgery, and where your patient or where your student can be assessed. And very often, our surgeon/ surgeries or surgery theatres are cancelled and then students get no opportunity. Many of our cases in theatre were cancelled because of the non-availability of surgical instruments</p>
Shortage of staff	Lack of staff/staff retention	<p>We had a bit of a turmoil in terms of our teams, you know. The training teams shifted a little bit because of staff attrition position, and that's a bit of a disruption. And that forces us to make use of some of the registrars, as part of the training code, and that's where the junior group comes in. And I think there's perhaps not sufficient orientation and standardisation amongst that group. Assembling the assessment tools is such an enormous task and laborious, in this context of limited staffing, like when you are making MCQs, that's the main weapon that we use now. Each division has to produce its own MCQs, which have to be improved and to be graded according to a grade one, two and three, three - easy answers two - Not so easy and one - difficult answers so that we can challenge different levels of thinking. Those things take time. From a historical perspective, I think the addition of extra work with no addition of extra hands to do the work. So, we are very creative in thinking of ideas and thinking of ways of teaching and assessing. But that is exponential compared to very limited growth in human resource capacity to do the reviewing or the assessment well. Okay. So, we have a lot of good ideas, but it takes effort energy and commitment to pull it through and implemented relatively equitably amongst the whole student population. Because it takes time. And nobody recognises that, that is, you know, it's</p>

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
		just become extra part of your work. We gradually increasing our number of students but we're not increasing number of seasoned consultants and teachers.
Students' profiles	Lack of profiling of students to document all accounts	Sometimes you address it, but you don't, it's not written down. I think that's one of the things we work on now to get to document all account. We have the students where we assess them all, we address them. So that we've got it in the student's file. If we need to make a decision on a student, we don't say, oh that student that was like this in the first year, there was this problem in the second year, but we don't have a trail of the problems. They will often say in a meeting, for instance, Yes, we've got the same problem with the same student, but it was never documented.
Solutions	Solutions to challenges or barriers	
Comprehensive assessment tool	Develop a comprehensive assessment tool	I think we've got a format, against which it's measured. But I think the format can be more comprehensive. It's easier to examine the scholar, for example, where they are examined all according to the same predefined rubric that obviously a little bit easier to minimise that bias
Face-to-face assessments or simulations	Have more face-to-face interactions with patients and students	Fortunately, in our situation, we are having the simulation unit, where we could simulate a patient and anaesthetic and that worked very well. We had missed real cases, but we had the opportunity of simulation cases. I gave them the opportunity to either do it online or face to face, they chose face to face because they are probably few. There were only 13, so it wasn't an issue to have that number in the venue. So, we did manage to an extent that the teaching did take place, effectively, because I mean, I'm not even sure how I was going to be sure that the student on the other side actually comprehends what I'm saying. In class, you can read faces and see this, this one is nodding for the sake of it. "Don't ask me questions", but I ask, nonetheless. But then, you can read the faces. You can also see when they're uncomfortable when you're about to ask a question.
Improving cognitive capacity	Improve the teaching of reasoning skills	We then asked the question as to what are the skill sets, which are really important for these guys? and the feeling was that many of these clinical things, they will pick that up in their later years, but, if we concentrate on improving the cognitive and understanding capacity, how to address, and solve a problem (instead), that will be of more value to them, later on, because the practical exposure they can get anytime. If you've got good practical exposure but you haven't got the ability to think and to interact, that means nothing. So that made us shift towards rethinking what is really required.
Online assessments	More online assessments	We loaded exactly the same case online which the student completed online during the same time the other people wrote their class test, and the oral (assessment), we actually did manage to do it on Blackboard where the examiners and the students were communicating as we are communicating now. I think more and more often in this COVID period, we move to the online environment. I've seen COVID just accelerated on what we were doing.

Table 4.9 shows the identified gaps and challenges experienced by educators with regard to how they assess AfriMEDS in the UFS medical programme in the teaching and learning environment.

Table 4.9: Gaps identified in assessing students' competencies with regard to the AfriMEDS roles

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
Gaps		
Assessment tools	Lack of assessment tools for skill integration; community-based education assessment is affected by practical constraints; there is no correlation between practical and theoretical evaluations	There are limited resources and community-based training facilities. In community-based assessment, much is beneficial with feedback, and is on a one-to-one basis and the university does not really make provision for that. And so, they would dump X number of students because that's what they've been told to do, but they do not always consider the practical constraints and the support and curriculum transformation of certain projects. The last part of the module which needs the students to demonstrate whether they can integrate the knowledge, as well as apply the knowledge that is acquired within the module. And for us to get to assess that, there isn't an assessment tool specifically for that. We never get the opportunity to follow up on the skill of integrating I don't think it's emphasised.
Soft skills	Lack of formal assessment for soft skills	Professionalism and whether they're good communicators, whether they can have good leadership skills, and collaborate well with the team, and whether they will be good at working in a healthcare environment, those are definitely gaps, which we are not assessing, currently. I saw a bit lacking was shaping professional competency. The role modelling and everything happened throughout the curriculum for sure in all the modules, obviously, they, addressed the softer skills to develop professionalism, but it wasn't assessed in some way. Some of these competencies are soft skills, and are more difficult to assess reliably and valid. And I once was a simulated patient. And then one of the students came in. She was very, very strange. She was chewing gum and she kind of set yourself down in a very sort of risky.... She didn't look right she looked quite rude and she said, Oh, I'm going to be your doctor for the next five minutes. And then there was actually nothing on the, placement. She scored high enough marks on that specific assessment because 'twas a primary medicine assessment. There was no room that we could say that this person was inappropriate with their manners, so I did raise it with the programme director, and there was actually another external examiner in a different subject. That said no, this person cannot pass, there's something not right. But at the time, the assessment was based purely on the academic knowledge. So, to me it still feels, if you are a poor communicator or an occasional you still managed to pass, unless there are very serious concerns, but I think that the GAs are not always valued enough. So, you would like this to be addressed, because the student can pass (based) on their (content) knowledge. Even if their manners are bad.
Benchmarks or standardisation	Lack of benchmarking or standardisation	Leader and manager can be difficult because sometimes you've got natural leaders where the students just take the lead. But it is difficult to assess that. So, it's easy to see who the leaders are, but how do you assess the students that are, let's say, introverts, that do not show competency? so that is difficult. Professionalism is easy to observe, but it is very subjective. Maybe, I'll say what the student is professional, and my colleague will say no, that's not professional. It makes it difficult to develop the assessment tools that are fair to students, because it's very subjective. Each module should have a very clear indication of how each of the competencies are addressed and assessed or not. So, many of these perhaps are done implicitly. It would be very valuable to explicitly map how each of these competencies are addressed and assessed.

CATEGORY (KEY THEME)	DESCRIPTION	EXCERPTS
		We need through the years to develop a system that covers all these attributes quite, quite well.
Clinical exposure	There is lack of work-based clinical exposure	The other thing that students need is more clinical exposure. People should be able to translate the knowledge that they get through simulation also in the physically environment. Yeah, because it's very difficult or easy to input 20 minutes to pretend that you're very nice and patient-centred but if you should do that all the time so every day somebody must be able to see that and say you do that or you don't do that and you need to get feedback on that as well. I think workplace-based assessment will be better, especially for collaboration, professionalism, health advocacy, communicator, and even the leader and manager.
Electronic platforms	Lack of an App to assess roles such as professional, communicator, collaborator; to also do peer or self-assessments	If we could have an electronic platform where we could do that by the App. It will assist a lot so that you can just put it in on the app because you're not with the student the same time, or you need to go back and write the report, or give the marks to somebody else or if there was an App available. And even if students could actually assess peers or themselves as well, we think it will greatly assist if a student can say I did this and I take responsibility for that or another student can say, I saw this behaviour and put it on an app.
Feedback	Lack of continuous and timeous feedback	As a last point is proper feedback to students. You cannot wait three weeks before you give them feedback or don't give them feedback at all. Workplace assessment and continuous assessment that you can get feedback every day a little bit of feedback every day. It's written down, what to improve on; other people can see that you received that.
Integration	Modules lack integration; get rid of silo training	But as to the fact that people are still in professional silos, when you go into practice that will undo a lot of that valuable work. In a silo training way, you only have one profession. It is not that easy to assess the collaboration, we can do, sometimes we do simulations with small groups, where they have, for instance, a station, and then you can assess and observe collaboration with other colleagues, but not interprofessionals. Stop treating your content, as if you are dealing with silos, you need to be able to integrate. I don't think we have the platform yet to constantly point out that if you study Anatomy and you learn something in Histology and Histology is telling you about cells and these cells makes up now, the muscles you read in Anatomy, you need to be able to integrate those two. Because at the end you write an integrated assessment, where you are required to study both Anatomy as well as Histology and go and show that you now can integrate the information. I think that is where the gap is, and a lot of work needs to go into that. They still treat modules, as stand-alone, as silos and they do not bring in the integration thereof It's also an issue when you get to the fifth years with another doctor indicated it in Obs & Gynae, if a woman goes and gives birth, and this woman has a thyroid problem, the person who is going to deal with the giving of the birth does not necessarily know how to deal with a thyroid problem so someone else needs to come in. At the end of the day if this woman probably has three issues there'll be three doctors surrounding her because now everybody's just focused on what they're here for. So, what happens to the integration of the knowledge.
None	No gaps	No real major gaps in our circumstances. It's a pretty thorough system and I can't really see where we could offer any additional assessment, I think under normal circumstances it is pretty good.

Table 4.10 shows how educators have identified or benchmarked best practices with regard to assessing AfriMEDS competency roles.

Table 4.10: Best practices identified or adhered to by school of medicine members with regard to assessing the AfriMEDS roles

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
Best practices		
Collaborator	Work-based assessment; Teamwork; Communication skillset; Feedback from students	In MANA, I know where they work in groups. And after each section of that, it's an anatomy module, so often they've done, say for instance, the head and neck section in the group. And we looked at three criteria: professional attributes, group dynamics and knowledge and skills development. So, for instance, with professional attributes they use of subscript we want to look at its adherence to ethical practical principles, so do the students adhere to the dress code. We get feedback from students. And that helps us to then modify certain aspects of the project for the next group. Workplace assessment.
Communicator	Rubrics; Calgary-Cambridge model; Work-based assessment	We have communication exam, which again, is moderated and it's difficult to know with clinical and more exams like that to say what is best practice. I think we have a very hands-on approach, where students need to illustrate from the first year onwards, already, when they are still developing communication and receive the skills and leadership skills and managing and collaborative skills from the first year. They need to present each semester in different modules, different subjects that they've got group projects, they need to work on. I think this is a good /best practice it brings together all the roles. Rubrics. In terms of helping students to know how to be good listeners, know, following the Calgary- Cambridge model. In terms of the structure of the consultation and in building rapport with the patient while at the same time having a structure to the interview. I picked up things that they could practice because we studied all the different guidelines and the curriculum as they said you must develop for communication skills training, and that I think is importance for their professionalism and respect. Workplace assessment
Community-based medical education	Interprofessional training in Trompsburg	In 4th year, we've got three sessions on interprofessional training where they need to make a video and things like that and they go to Trompsburg together, all the Allied Health Nursing students as well as the medical students for a week, and they work together they've got their own programmes, projects. They go to schools; they go to old age homes to give presentations. That's also assessed, and they've got outcomes for that, and they get marks for that. We do try and emphasise to them the importance of diversity. We put a lot of effort to include city and Afrikaans phrases in our teaching, as well, to help them when they are actually going to the community that they are able to communicate and to understand that they are to manage their cultural and language barriers. It is interprofessional something. It's where a group of the health science students come together, they get trained on how to go out to one of our sites, which is Trompsburg, where they're going to visit, patients in their homes.
Community engagement	Interprofessional training in Trompsburg	In 4th year, we've got three sessions on interprofessional training where they need to make a video and things like that and they go to Trompsburg together, all the Allied Health Nursing students as well as the medical students for a week, and they work together they've got their own programmes, projects. They go to schools; they go to old age homes to give presentations. That's also assessed, and they've got outcomes for that, and they get marks for that. We do try and emphasise to them the importance of diversity. We put a lot of effort to include city and Afrikaans phrases in our teaching, as well, to help them when they are actually going to the community that they are able to communicate and to understand that they are to manage their cultural and language barriers. It is interprofessional something.

CATEGORY (KEY THEME) SUBTHEME	DESCRIPTION	EXCERPTS
		It's where a group of the health science students come together, they get trained on how to go out to one of our sites, which is Trompsburg, where they're going to visit, patients in their homes.
Leader and Manager	Work-based assessment	I myself am busy on developing that. Workplace assessment.
Professional	Code of conduct; Portfolios; Work-based assessment	We have a professional code of conduct. It's also published in the Phase Guide, in the dissection hall and everywhere There is also a place where the lecturer makes comments on this professional portfolio of a student. Workplace assessment.
Scholar	Rubrics; Formative assessment; Continuous assessments; Questionmark; Theoretical Paper; Blackboard; Online assessment	We have, you know, theoretical paper, which is very carefully laid out, it's blueprinted. It's moderated and we regularly review our question bank and we look at discrimination indexes and check out questions that are of good quality. Blackboard. We gradually are now and trying just to work on Blackboard. On the module, we've got module with a web page where we post everything for the students also do that and assess there. Use rubrics and things like that. students will know they've got the module guide with everything that we expect of them. And so, we follow the rules, basically, and moderate all assessments in that as well. Using the programme, Questionmark, as an assessment tool
Assessment policies and Accreditation requirements	UFS Assessment policy; Health Professions Council; SAQA	We align (our assessments) with the University of the Free State assessment policy. And the assessment policy very clearly points out, for example, reliability, validity, transparency, fairness, etc. We would align with the accreditation requirements of the Health Professions Council. The degree or the programme is also accredited or approved by the South African Qualifications Authority. And once again, we would have to adhere to the requirements set out by the Department of Higher Education and Training in terms of adhering to the teaching and learning and assessment required of programmes that are approved by SAQA. In terms of ensuring that the assessment standard is maintained, we have quite strict quality assurance processes is in the programme that include examination committees that sit at the end of every formal summative assessment at the end of an academic year and overview all those students' results based on the rules that are applicable for passing and assessment in the programme. HPCSA. We make use of external moderators. Our external moderators need to be specialists in the fields, preferably from other universities. That also have at least five years away from UFS, for more objectivity. So, all external moderators use senior consultants, with at least five years away from the user base for these five years; experience in the specific field of expertise.
None or Do not know	No best practices or do not know any	At the moment, we don't really assess them fully. It's more of a summit of a formative assessment on a conformal basis. And so, it's not really something that we give marks for. So best practices are hard to apply there. I'm not sure if I'm equipped to answer that question because I'm not directly involved on those training platforms, I'm a coordinator that sits in those meetings. I think we, in essence, are still swimming in tools that we've developed, and we haven't really had the luxury to compare ourselves with best practice at this stage. But that's my personal experience, may be, others would differ.

4.3.3 Challenges

Members of the school of medicine identified several challenges they experienced in relation to using assessment tools in the teaching and learning environment. Clinical assessments,

followed by COVID-19, were most repeatedly cited challenges.

COVID-19 emerged as a strong theme that was cited by most educators as a challenge, even though the study was not focused on it. The advent of COVID-19, its challenges and uncertainties, and how it fast-tracked the use of electronic platforms was acknowledged by members of the school of medicine. They had to employ several evaluation strategies to accommodate safety practices and protocols during the pandemic. Lack of face-to-face interaction during clinical assessment was a major hindrance.

Clinical assessments were reported to be artificial, subjective, and unfair. Dwindling numbers of patients for practical exposure, the cost of simulated patients, and shortage of staff were also identified as barriers to adequate clinical assessment.

Lack of comprehensive assessment tools and lack of communicator between teaching and learning departments were also cited as barriers. One member of the school of medicine recommended the following:

Expand our assessments; we would include more assessments, which would look at collaborator, professional, communicator, and leader.

4.3.3.1 Gaps

Lack of assessment tools was commonly cited by the school of medicine members as a major gap in assessing students' competencies with regard to the AfriMEDS roles. Skill integration was advocated by some members of the school of medicine to pursue the development and use of a comprehensive assessment tool, and to get rid of silo training. One member lamented:

Stop treating your content as if you are dealing with silos; you need to be able to integrate.

Another stated:

We never get the opportunity to follow up on the skill of integrating; I don't think it's emphasised.

Members reported that there is no correlation between practical and theoretical evaluations. For example, it was revealed that, during the interprofessional training, the community-based education assessment was affected by practical constraints.

In community-based assessment, much is beneficial with feedback and is on a one-to-one basis, and the university does not really make provision for that. And so, they would dump X number of students because that's what they've been told to do, but they do not always consider the practical constraints and the support and curriculum transformation of certain projects.

Lack of formal assessment for soft skills, and lack of continuous and timeous feedback were also identified as gaps.

Professionalism and whether they're good communicators, whether they can have good leadership skills, and collaborate well with the team, and whether they will be good at working in a healthcare environment, those are definitely gaps which we are not assessing currently.

Workplace assessment and continuous assessment that you can get feedback every day, a little bit of feedback every day.

A decline in work-based clinical exposure was also cited as a shortcoming that affected the attainment of good quality medical graduates.

The other thing that students need is more clinical exposure.

4.3.3.2 Best practices

Members of the school of medicine gave a list of assessment tools that they adhered to for assessing the AfriMEDS roles: work-based assessment, feedback from students, rubrics, Calgary-Cambridge model, interprofessional training in Trompsburg/Botshabelo, code of conduct, study portfolios, Questionmark, Exam Soft, theoretical paper, and Blackboard. In addition, interview participants agreed with the assessment policies of UFS and accreditation requirements of HPCSA and the South African Qualifications Authority.

4.3.3.3 Need to assess students effectively

Several needs related to being more effective at assessing students' competencies regarding the AfriMEDS roles emerged. Training was the most cited need by the members of the medical school. Different forms of training were recommended, such as continuous/refresher training for assessors, training and evaluation of assessors, and work-based assessments for students. One member suggested the following:

Continuous professional development, because that's probably an area where none of us can ever say, we have all the answers. I think assessment practices and change.

Another stressed,

I think it's really valuable that continuous professional development of everyone involved in assessment should be a priority: "Electronic platforms were promoted as a need for online and remote teaching and learning.

Several members referred to the need to develop an electronic study/student portfolio:

I think something like an electronic portfolio where you can get all the time. You can get an insight into this student, you know, how's it going with him? How do they perceive what they are learning? All those things. And that can give you a bit of a better picture", as well as improvement of internet access and availability of data to students: "The need to make internet connection available and easily accessible to students was highly recommended.

A need for more training staff was cited. One member suggested using practising professionals as tutors:

If we had somebody who was more of a constant in the clinical environment time, so if we had more and more sort of, MOs [medical officers] or people like that, who are helping us in clinical loading, and somebody that consultants could have who has more time to make assessments of the students in the ward.

The other member reckoned that research scientists should be employed:

We could do with the restoration of the research scientists who can help coordinate in the departmental research projects and enhance collaboration in both the department professionals and the students who rotate.

The development of a standardised assessment tool for benchmarking and objectivity was also a common need.

I think you know that we try to make the assessment as fair as possible. But as I said, the difficulty in clinical assessment is that it is more subjective. And so, it is difficult to say this is an exact blueprint. You can't blueprint examiners, and they are all different and have their own opinions.

A comprehensive and in-depth rubric was also mentioned:

So at least with a rubric, then everyone will be using the rubric, or at least something that is derived from that rubric, maybe they would adjust it for their own purposes or for their own different fields, but basically it would be working towards the goal, because at the moment skills are taught, but they are not assessed, but at the end of the programme, we assume that the student has got all these attributes that we desire."

4.3.3.4 *Support required from management*

When they were asked how management can support the members of the school of medicine to be more effective at assessing students' competencies as they relate to the SACMBE roles, resources commonly expressed as needed were more staff, followed by electronic resources. It was reported that extra staff is required for effective assessment:

More human resources to be able to do thorough assessment", and employment of experienced professionals who are role-models should be considered: "I think the thing is before we want to teach our students, it actually has to be assessed and more throughout the profession, not only in the academic environment but everyone needs to be able to be accountable for those values.

One member suggested employing independent assessors:

A neutral pair of eyes needs to come in with the rubrics, and they need to be exposed to the students, because I can say to save myself, I can say I do teach them A, B and C and D. But now, did they acquire?

Availability of data, an internet connection, and electronic equipment for students were high on the list of support required from the manager. One member proposed,

An electronic kind of portfolio for each student, so that it's easy for any lecturer, to, to log into a student's file and say, Okay, this happened in class, so I think that is a problem with professionalism. Because going back to the paper-based way can be very difficult.

Members revealed they needed support from the manager to offer continuous feedback to students and that it should be made a requirement for assessors to provide to students:

You cannot wait three weeks before you give them feedback or don't give them feedback at all.

In the same breath, members said educators had to do continuous assessment:

We should have continuous assessment and there should be more emphasis on continuous assessment, rather than summative assessment at the end of the year.

Training events and workshops for assessors were also recommended:

*Even workshop, staff development sessions where lecturers, can be trained to get better at the assessment.
Involve the lecturers in the development of the assessment tools because they make time and it's made for them.*

Members required the manager to improve working/manager relations with government, as it currently impacts negatively on effective assessment of students due to “the cancellation of cases, no personnel available, and no apparatus available”.

The manager was asked to support collaboration with other universities:

It would be nice if we could also partake with other universities. Now we sort of feel isolated, yeah, what we do. You have to go and read them what best practices are, but it would be nice and more exposure to what other universities through international collaboration.

Members stated that the manager should consider the quality of assessment, not the quantity.

There should be competencies that we can actually write off before the end of the year. If you can do something you don't need to reassess that 20 times the same student that can do the same thing so we can have a policy.

4.4 SUMMARY OF THE QUALITATIVE RESULTS AND CONCLUSION

- i. The HPCSA 2017 report and recommendations are consistent with UFS’s need to provide CBME, COPC, and CBE in its curriculum. The aspects of quantity (time) and quality (teaching and training, educators) were emphasised by the HPCSA 2017 report.
- ii. Even though the seven roles of AfriMEDS competencies are explicitly mentioned in the module phase guides, their assessment, implementation, and methods of easement are not explicit; they lack consistency and are misaligned with the recommended CanMEDS assessment tools.
- iii. Feedback from educators amplified the gaps in teaching, training, and assessing a full complement of AfriMEDS competencies. The main gaps identified are a) time and exposure, b) resources: human (personnel and development), infrastructure, and finances, and c) support by faculty.
- iv. COVID-19 emerged as a strong theme which had a major impact on effective implementation and assessment of the AfriMEDS physician competency framework, even though it was not part of the research aim and question.

The challenges that were identified hamper the embedding of the AfriMEDS competency framework – this assertion was supported in Chapter 1 (*cf.* 1.3).

The following chapter will present the findings of the survey that was administered to medical interns.

CHAPTER 5

SURVEY OF MEDICAL INTERNS

5.1 INTRODUCTION

The preceding chapter provided a presentation and analysis of research findings: document analysis and interviews with educators. This chapter will present the study findings related to the survey that was administered to medical interns who were completing either the first or second year of internship (medical residency) in 2020 and who had studied at UFS. This chapter will provide demographic information, which will be followed by the evaluation of the sufficiency of the eight AfriMEDS core competencies (medical expert, communicator, collaborator, leader and manager, health advocate, scholar, professional, and community-based education) respondents were expected to master, which will be followed by generated sufficiency scores based on the AfriMEDS framework.

5.2 THE FINDINGS OF THE SURVEY FOR INTERNS

First, the demographic information of the interns who participated in the study will be described, followed by the findings relating to nine expected core competencies (overall internship experience, medical expert, communicator, collaborator, leader and manager, advocate, scholar, professional, and community-based education). Scores were generated for the core competencies, which will also be presented in this chapter.

5.3 DEMOGRAPHIC INFORMATION

The gender distribution of the participants is depicted in Table 5.1 (Appendix L). A total of 71 medical internship students participated in this study, of which 52% are women. The majority of the participants are white (74%), and 9% are Africans. Approximately 68% were in their second year of internship and aged 25 years on average.

The majority of the medical students (22%) were doing internship in the Free State province, followed by Eastern Cape (18%), and North-West and Gauteng with 14% each. None of the participants were in Limpopo province for their internship. Of all the provinces, the Free State province had the most female (24%) interns who participated in the study; the most male interns (23%) who participated in the study were in the Eastern Cape (*cf.* Table 5.1, Appendix L).

5.4 IMPLEMENTATION OF AFRIMEDS CORE COMPETENCIES ASSESSMENT

This section describes the perceptions of the interns in seven areas that measure the implementation of AFriMEDS core competencies. Figure 5.1 highlights positive perceptions regarding the overall experience of internship in relation to AfriMEDS core competencies. More than 80% of the interns had a positive perception in four of the seven overall internship experience competencies assessed. Only 43% of the interns indicated that they had a positive attitude towards public service, 57% reported that they coped well psychologically, and 77% of them believed that they were well oriented (*cf.* Figure 5.1).

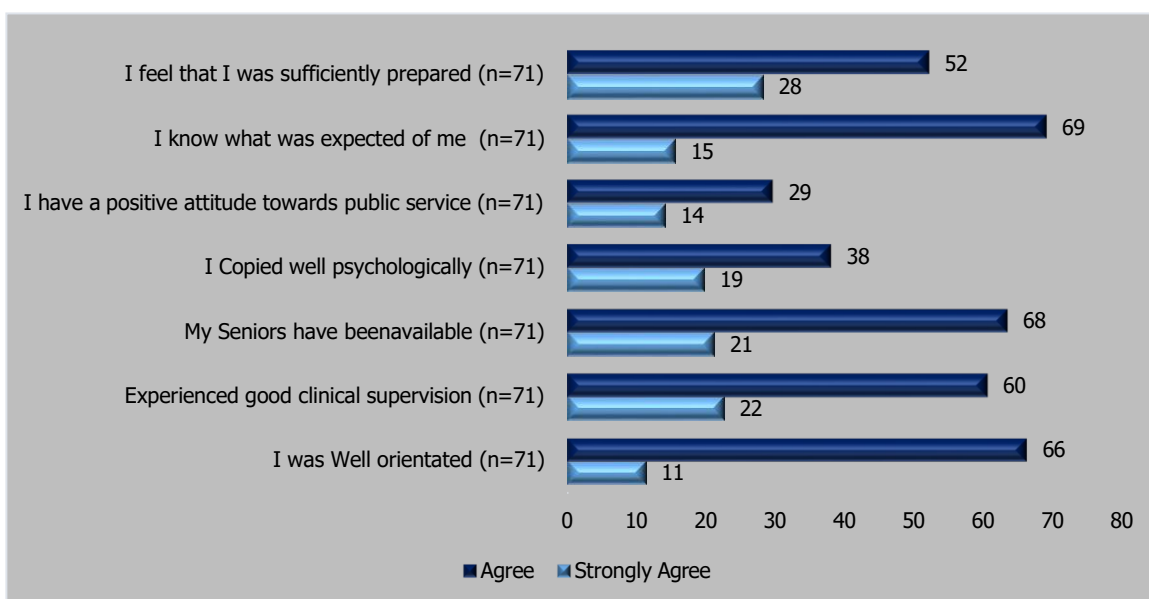


Figure 5.1: Positive responses regarding overall internship experience competencies

Figure 5.2 depicts the perceptions of interns in relation to medical expert core competencies. More than 80% of the interns who participated in the study had positive perceptions of all the medical expert core competencies, except for assisting with basic surgical procedures, of which only 77% had positive perceptions. All (100%) of the interns provided a positive response on comprehensive physical examination and carrying out basic procedures in wards.

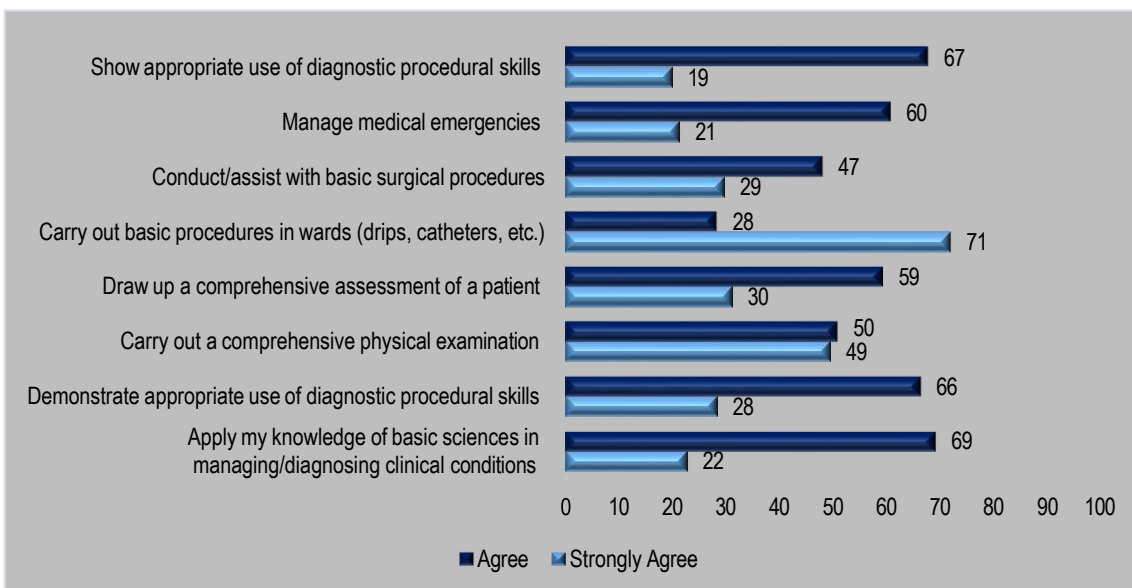


Figure 5.2: Positive response regarding medical expert competencies

The positive responses on the communicator core competencies are shown in Figure 5.3. Medical or health expert competency role, which is the integrating role of all other competencies, shows that medical interns felt that they were adequately trained and prepared for internship, except with conduct or assist with basic surgical procedures, as only the score was below 80%. Only two communicator competencies were perceived positively by more than 80% of the interns (94%) who responded on the knowledge of presenting a case study to peers. The competency of dealing with relatives of patients in distressing situations was perceived positively by only 57% of the interns (*cf.* Figure 5.3).

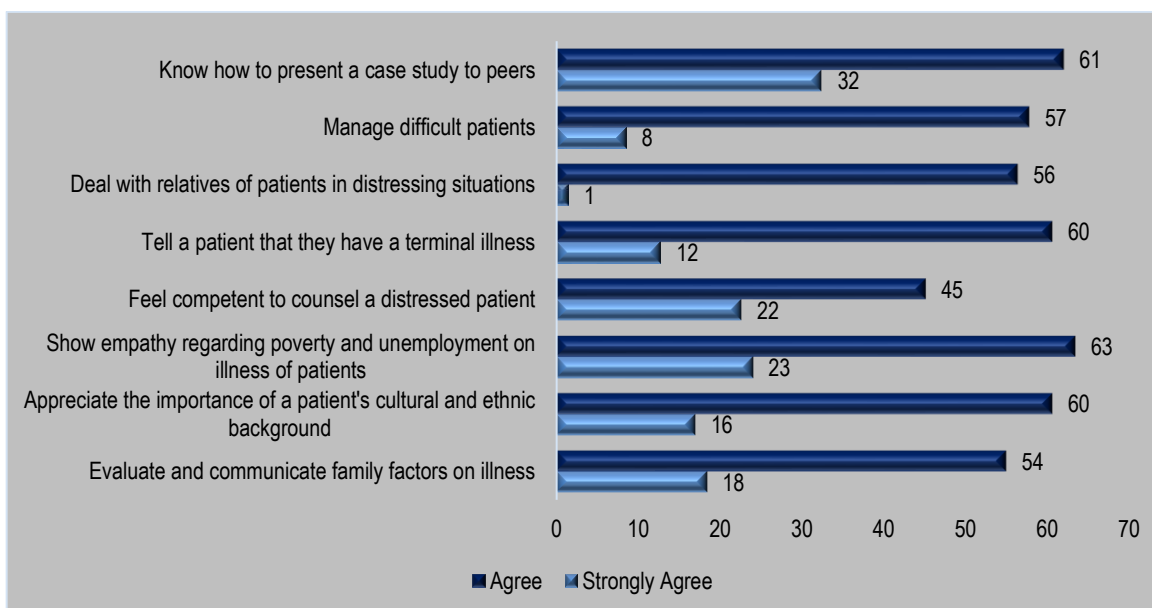


Figure 5.3: Positive perceptions regarding communicator competencies

The positive responses on the collaborator-related responses are shown in Figure 5.4. All the collaborator competencies are positively perceived by more than 80% of the interns, except for being empathic towards the nursing staff, with only 64% of interns providing positive responses. Work in interprofessional teams was positively scored by the highest number of interns at approximately 93% (*cf.* Figure 5.4).

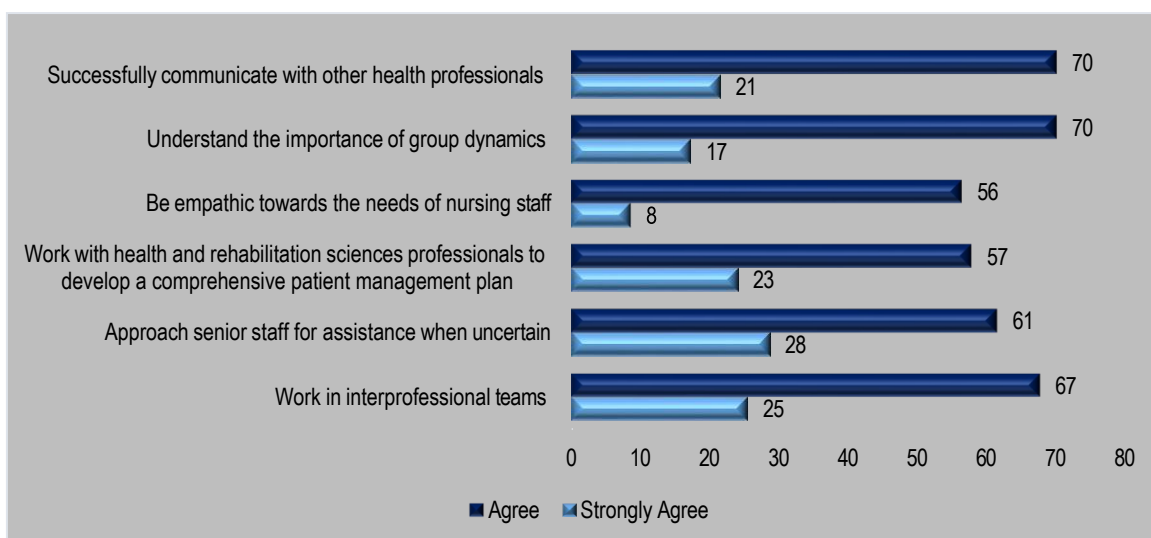


Figure 5.4: Positive responses regarding collaborator competencies

The positive responses relating to leader and manager are presented in Figure 5.5. Only two of the leader and manager competencies were perceived positively by more than 80% of the interns. The competency with the highest positive response (83%) was function successfully in resource-constrained environments, which was followed by understanding the South African healthcare system (80%). The competency that received the lowest (45%) positive response was selecting drugs by considering cost vs risks vs benefits, which was followed by coping with stress at the workplace (46%) (*cf.* Figure 5.5).



Figure 5.5: Positive response regarding leader and manager competencies

The positive responses regarding health advocate competencies are demonstrated in Figure 5.6. All the health advocate competencies measured were scored positively by more than 80% of the interns, with the highest being providing health education to patients (scored positively by 97% of the interns), followed by discussing health risks with patients, which was scored positively by 94% of the interns (*cf.* Figure 5.6).

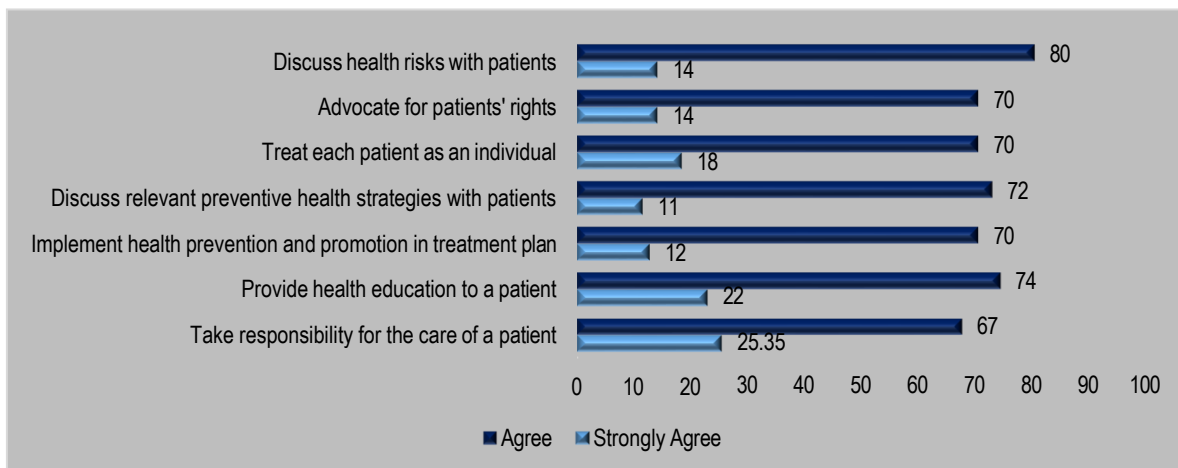


Figure 5.6: Positive responses regarding health advocate competencies

The positive responses regarding competency of scholar are indicated in Figure 5.7. Six of the scholar competencies were positively scored by more than 80% of the interns, with the highest being appreciating the importance of lifelong learning (94%), followed by recognising my own clinical limitations (94%). Interpret and present research data was positively scored by only 66% of the interns, with critically evaluate research as it relates

to my clinical practice being positively scored by 69% of the interns. Scholar competencies subsections that were not generally well scored by medical interns are on interpretation and presenting of research data (66%), critical evaluation of research as it relates to clinical practice (69%), and planning and developing a research project (70%).

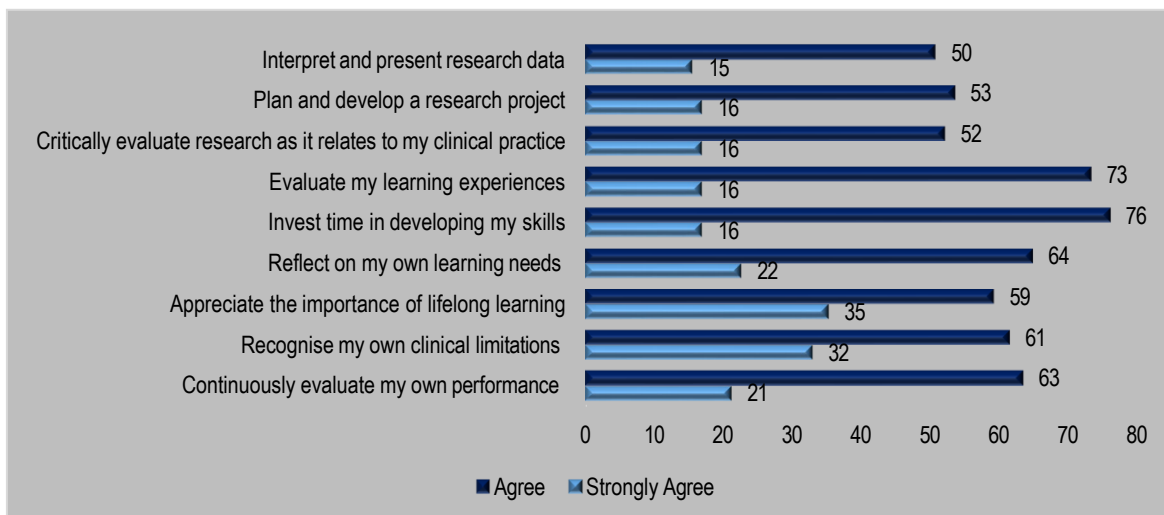


Figure 5.7: Positive response regarding scholar competencies

Positive responses regarding professional competencies are shown in Figure 5.8. Only five of the nine competencies were positively scored by more than 80% of the interns. Appreciate privacy and autonomy was scored positively by the highest number of interns (94%), followed by maintain the attitudes appropriate to the practice of my profession (92%). Professional competencies subsections on how to approach ethical dilemmas (75%), cope with one's emotions in distressing clinical situations (60%), knowledge of professional role and responsibility in the event of social protest (24%), balancing of work and personal life (43%), second-least positively scored was knowing my professional role and responsibilities in the event of social protest (57%) were rated below 80% by medical interns.

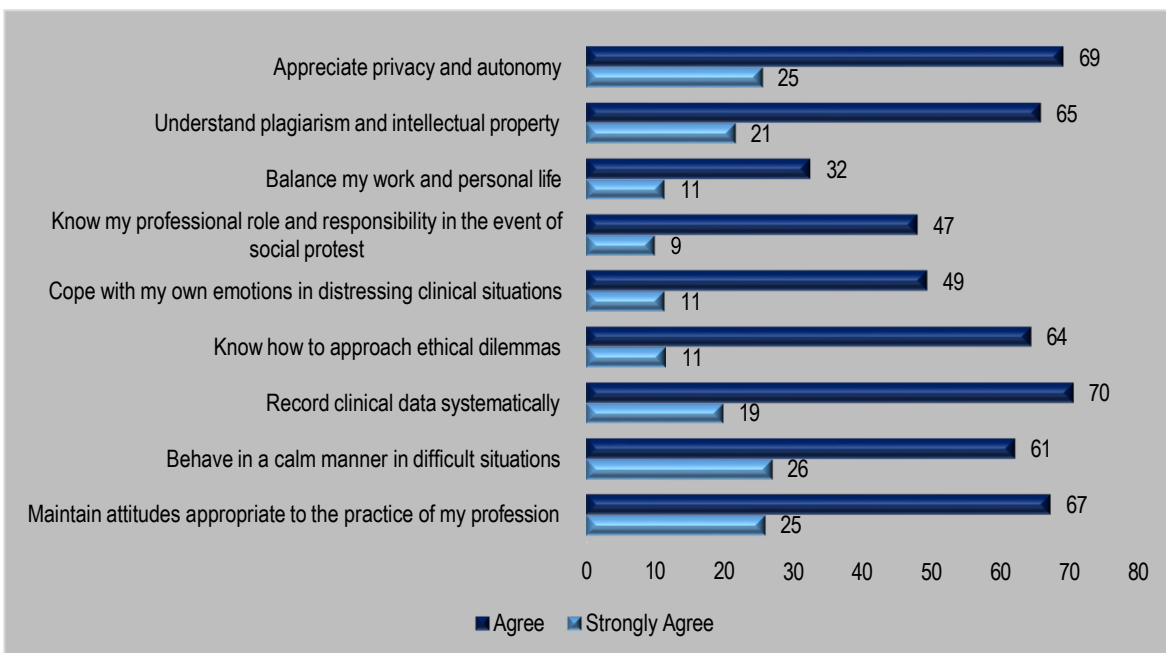


Figure 5.8: Positive responses regarding professional competencies

According to Figure 5.9, none of the community-based education competencies was positively scored by more than 80% of the interns. The competency that was scored positively by the highest number of interns was understand community perspective on their healthcare needs, at 73%. Less than half of the interns scored learn basic language relevant to my community positively, namely, 40%, and the competency with the second-lowest positive response was how to communicate with patients from the community in their language, at 40%.

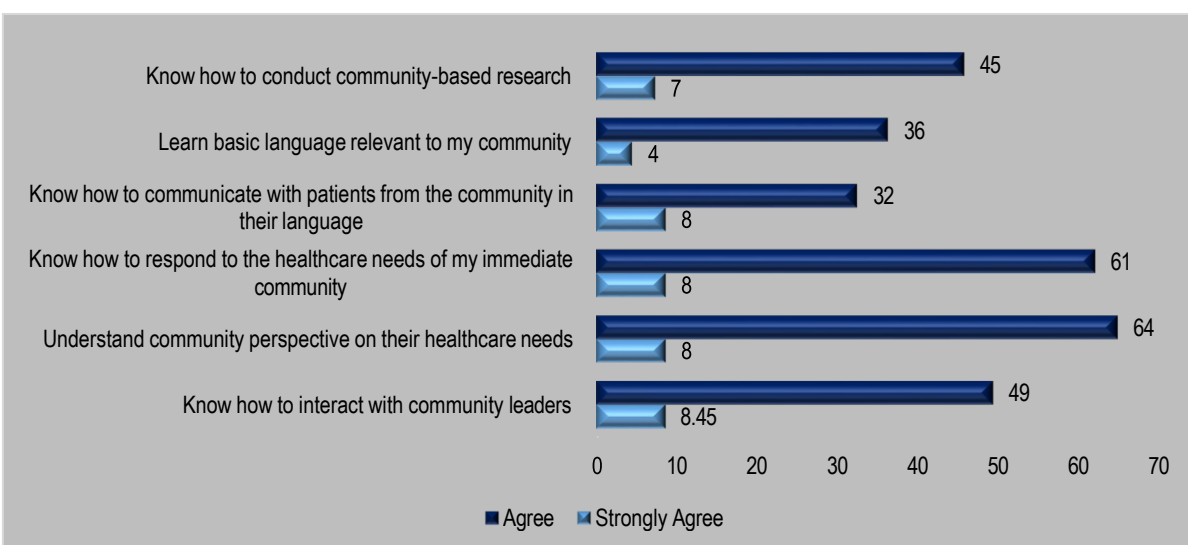


Figure 5.9: Positive response regarding community-based education competencies

The responses regarding overall internship experience competencies throughout the entire period are shown in Table 5.1. More than 80% of the participants provided positive responses in four areas, namely, clinical supervision (83%), seniors availability (84%), knowing what they were expected to do (84%), and feeling that they were sufficiently prepared for internship (80%). Less than half (43%) of the participants indicated that they had a positive attitude towards public service after their internship experience, and only 57% indicated that they had coped well psychologically during that year.

Table 5.1: The overall internship experience competencies over the entire period

ASSESSED STATEMENTS (n=71)	AGREE	NEUTRAL	DISAGREE
I was well oriented to my job by hospital staff when I arrived	55 (77)	8 (11)	8 (11)
Experienced good clinical supervision during my internship	59 (83)	10 (14)	2 (2)
My seniors have been available when I needed help	60 (84)	8 (11)	3 (4)
I coped well psychologically this year	41 (57)	13 (18)	17 (23)
I have a positive attitude towards public service due to my internship experience	31 (43)	16 (22)	24 (33)
I know what was expected of me during the internship	60 (84)	3 (4)	8 (11)
I feel that I was sufficiently prepared for internship during my undergraduate studies	57 (80)	10 (14)	4 (5)

Table 5.2 provides an overall summary of the domain areas (measured by yes/no questions) that were used to measure AfriMEDS. For all the domains assessed, nearly 92% of the interns provided positive responses regarding their medical expert, while 90% of the interns provided positive responses on scholar and 84% provided positive responses (% yes) on professional. Only 63% of interns gave positive responses regarding leader and manager (*cf.* Table 5.2).

Table 5.2: Distribution of positive (yes) responses regarding perceived sufficient assessment of core competencies in undergraduate programme

QUESTION NUMBER	CORE COMPETENCY AREA MEASURED	NUMBER (COUNT)	%YES
Q3.9	Medical expert (n=71)	65	91
Q3.57	Scholar (n=71)	64	90
Q3.68	Professional (n=70)	59	84
Q3.19	Communicator (n=71)	56	78
Q3.46	Health advocate (n=69)	54	78
Q3.27	Collaborator (n=69)	50	72
Q3.76	Community-based education (n=70)	50	71
Q3.37	Leader and manager (n=69)	44	63

The assessment of the undergraduate medical programme was consistent for the two groups of interns as shown in Appendix L (*cf.* Table 5.3: Average of the positive composite core competency scale on perceptions of undergraduate programme).

5.5 RESPONSES TO OPEN-ENDED QUESTIONS IN INTERN SURVEY ON

This section will present results in relation to the open-ended questions in the online survey completed by medical interns (*cf.* Question 3.9; Annexure A).

A total of nine core categories of competencies (roles) were classified as insufficient assessments as shown in Table 5.4, and 25 subcategories that emerged from the content analysis are presented in Table 5.5. Relevant quotations from open-ended questions in the survey are used to support the categories.

Table 5.3: Categories and subcategories of insufficient assessments

CATEGORIES (n=9)	Subcategories	NUMBER PER Subcategory (n=25)
Medical expert competencies	No formal assessment Lack of clinical exposure Insufficient time for assessment Subjective assessment	4
Communicator competencies	No formal assessment Lack of face-to-face assessment Communicator is not formally taught Limited counselling lessons	4
Collaborator competencies	No formal assessment No effective collaborator Task shifting	3
Leader and manager competencies	No formal assessment Lack of platforms for assessment Limited skills assessed Practice opportunities granted to the select few	4
Health advocate competencies	No formal assessment	1
Scholar competencies	Limited teaching and training	1
Professional competencies	Difficulty in assessment Limited attention No formal assessment	3
Community-based education competencies	No formal assessment Language barrier	2
Training and assessment	Inadequate teaching Low-level learning outcomes Need for improvement	3

Table 5.4: Number of times the core categories were cited for insufficient assessment

CORE CATEGORIES (n=9)	NUMBER CITED (n=100)	PERCENTAGE (%)
Medical expert competencies	10	10
Communicator competencies	11	11
Collaborator competencies	10	10
Leader and manager competencies	16	16
Health advocate competencies	13	13
Scholar competencies	10	10
Professional competencies	7	7
Community-based education competencies	16	16
Training and assessment	7	7

Table 5.5 shows the number of times the core categories were cited by medical interns in the survey while they described their experiences of measuring the implementation of the AfriMEDS components. The core categories were cited 100 times in total in relation to perceived insufficiency of assessment. Leader and manager, and community-based education competencies were two core categories that scored equally highly for insufficient assessment, at 16%.

5.5.1 Findings: Perceived insufficient assessment

The findings regarding perceived insufficient assessment are discussed in this subsection.

5.5.1.1 *Medical expert competencies*

In the survey, medical interns cited lack of clinical exposure as the main reason for medical expert competencies being insufficiently evaluated. One of the interns noted that,

Although we are taught theory well, I feel more exposure to practical environment will assist with preparing students better.

While many believed that the medical expert competencies had not been formally assessed, they had received “an impression mark”. Some admitted that some degree of assessment had been done, even if it was in isolated cases: “consultants assess us but they rarely if ever saw us working with patients”.

It was also perceived that the assessment of medical expert competencies was subjective and unfair.

There is often enough teaching, but the testing is too superficial. It doesn't motivate anybody to build foundation knowledge. It only motivates for superficial knowledge that escapes as soon as you leave the hall.

Sadly, at UFS marks are made up before you even enter the exam. Based on how well liked you are by the examiners, and if you bought the examiners coffee for ward rounds.

Compared to other universities, local and international, UFS assesses its own students extensively. However, students who had trained in Cuba under the Nelson Mandela-Fidel Castro Medical Programme and who completed their degrees at UFS are excluded from this statement – expectations for them to be competent doctors are less than acceptable.

There seemed to be insufficient time for assessment, as one intern stated,

There is also not always enough space for patient management or plans in the undergraduate programme, which can make one uncertain when truly having to decide on the specific management of the patient in front of you and the practical aspects around it.

Furthermore, low-level outcomes were mentioned as limitations for comprehensive assessment. One intern stated that,

I feel the minimum standard is too low. Real world is a lot harder.

5.5.1.2 Communicator competencies

The medical interns indicated that communicator was a difficult skill to assess; hence, it was “undervalued in exams” and was “not emphasised during training”. Although it was “not formally taught”, “there was lot of opportunity to acquire the skill”.

Some interns shared a common belief that they received few lessons on counselling skills that could establish therapeutic relationships with patients and their families, which resulted in insufficient evaluation.

We could've done more situations to make me feel more comfortable breaking bad news or giving a patient a difficult diagnosis and outcome.

I feel communication with patients and families, especially the delivery of bad news, wasn't focused on enough. More time could be spent in developing basic counselling skills, as the delivery of bad news is one of the most taxing parts of our job.

Not having real patients to practice on exacerbated the challenge, as cited by one intern:

We did not have a lot of real patients and patients' families to communicate BAD NEWS to.

5.5.1.3 Collaborator competencies

Working effectively with other healthcare professionals was generally considered to be taught during Interprofessional Education (IPE) and clinical rotations but was not assessed. It was reported by one intern that,

No emphasis was placed on collaborating with other disciplines. We had very little exposure on when to refer to which discipline

Some interns disregarded collaboration platforms such as IPE, as they considered it ineffective for assessing collaborator competencies.

I don't think we collaborate much in our undergraduate studies. That class all the disciplines participate in during our 4th year (I can't even remember the name anymore) really meant nothing. It didn't teach us anything, felt scarily close to life sciences at school and just generally is a waste of time. Sorry. I don't know what the solution is though – it's not like there is any more time in the UFS undergraduate programme to spend chatting to other disciplines.

The IPE week did not effectively allow us to improve collaboration.

Interns reported that “*the pathetic 'integrated' modules did little more than waste our time*”, while another said, “*there were not enough opportunities in the wards to interact in multidisciplinary teams*”. Task shifting also emerged as a reason for insufficient assessment. Two interns stated that,

The job of interns often overlaps with that of nursing staff. Often interns end up doing all procedures for patients (drips etc.) nurses often refuse.

We did a lot of strenuous work in hospitals. A lot of which we weren't required to do [and which we were subsequently not assessed on].

5.5.1.4 Leader and manager competencies

Participants perceived leader and manager competencies as inadequately evaluated. They reported that “*no formal assessment*” was done to demonstrate leader and manager in the programme. As a result, there were “*some who took chances and skipped ward rounds to study for tests and had an advantage and were never penalised*”. They also reported there

was a deficiency in the curriculum to learn and practise the related skills:

I don't think there was specific focus to develop our manager and leader skills. It was up to us as students to find opportunities to develop these skills.

There was never a time as a student where we were afforded the opportunity to lead.

Some medical interns admitted to having acquired limited practical skills regarding leader and manager. For instance, one intern reported that “*a lot of doctors don't have good coping mechanisms and become pessimistic in practice*” because “*stress coping mechanisms were things taught in second year. Maybe 1 or 2 lessons*”. Interns also declared some level of unpreparedness to lead and manage on their own.

In certain aspects our way of managing medico-legal documentation and cost management was not sufficiently assessed. As it was more taught as to complete for the purpose of completing exam papers and not for reality we face.

There was an MDOC [module on the doctor and the environment] subject and a practise subject in final year but they mostly focused on the private sector and the philosophy of the healthcare system as opposed to the harsh realities of administration and finding practical solutions in the public health sector.

It was understood that “*there are certain aspects that you learn through experience – these are one of them*”, and there were perceptions that practical opportunities to demonstrate leader and manager competencies were granted to a select few. For instance,

Only if you were group leader.

Often the same people fall in to leader roles, while others get pushed to the side.

5.5.1.5 Health advocate competencies

Medical interns reported that the health advocate competencies were taught but not assessed.

Patients' rights might be taught in theory but practical solutions for infringements in public health are lacking, especially when carried out by nursing members of staff.

One intern stated that it was a challenge to speak out on behalf of patients:

The hierarchy in Pelonomi [a training hospital near the UFS] intimidates one to actually speak out on your patient's rights cause you're just a student and your seniors know better.

Moreover, ethical conduct was not evaluated:

Medical ethics is actually so important and we never got tested on it. I feel it shouldn't be something that is necessarily evaluated for marks, but to be grilled on why you would make this decision in that case helps to get you focused on what your morals are and how the law applies.

Overworked assessors also led to insufficient assessment:

Most doctors are overworked and tired and forget about this aspect.

5.5.1.6 Scholar competencies

Participants perceived that scholar competencies were not fully developed. They cited lack of confidence to show commitment to lifelong learning and contribute to scholar competencies.

We haven't been trained sufficiently to criticise research. It wasn't incorporated into our learning.

We weren't taught to critically evaluate medical articles. Something I believe UOFS [UFS] could improve on.

UFS was highly commended for scholar competencies by some participants, although there was room for improvement.

UFS excelled at teaching scholar competencies but using it is Doctor dependent.

Too much emphasis on knowledge and not enough on skills. There was enough space for this in our MSSM module, it could however be implemented throughout the programme in modules.

Lack of motivation was cited by one medical intern:

Nothing motivated me to improve my skills.

Another stated that the scholar competencies were

Done too early in course with minimal practice.

5.5.1.7 Professional competencies

Interns considered professional competencies difficult to assess. They said,

I feel like this is more a character thing than something to be taught.

You cannot assess this until challenged in life.

No formal assessment was done:

It was taught on multiple occasions but never formally assessed.

More time and support were required to assess professional competencies:

Support in this regard was advertised but not followed through.

Once again, the subject MDOC [module on the doctor and the environment] served as a teacher for how to "live as a doctor" but it most mostly theoretical and focused on private practice. The reality of being an intern where contracted hours are grossly exceeded more often than not in a public setting is missing from the curriculum.

5.5.1.8 Community-based education competencies

Language barrier was commonly cited to be insufficiently assessed for community-based education competencies.

I had to relearn the new culture and basic language as we were only taught about the community around FS [Free State].

I as a white student just actually wish learning African language was compulsory because I wish every day that I could speak my patient's language.

The majority of participants cited the lack of Sesotho language education in the programme:

I do think there needs to be a lot more emphasis on the language barrier. It's such a struggle and the fault lie entirely with us.

I believe we would have benefited immensely from formal Sesotho classes and education.

5.5.1.9 Training and assessment

Teaching inadequacy of some aspects of AfriMEDS competencies in undergraduate medical

training was cited by some of the participants.

It would have been nice to have had a better approach and practice regarding resuscitation situations - e.g. ACLS/ATLS/PALS ACLS [advanced cardiac life support/advanced trauma life support/paediatric advanced life support] as a student.

Lot of stuff still only get learned when you start working.

One intern conceded that,

Ethics and integrity is something that can't always be taught. I honestly feel that interviews are needed to see who the person is. Too many doctors do this for status and money. I feel that being a doctor is a calling and this should be the driving force. So many interns I work with couldn't care less about patient care and work ethics and that needs to change and improve. We need a serving culture!

The low level of learning outcomes was cited for insufficient assessment for training.

I feel the minimum standard is too low. I see many doctors that can't diagnose or treat basic medical conditions, or even write basic referral notes.

While there is generally sufficient teaching, only the motivated really learn. The rest just waltz through getting the minimum and eventually become a doctor.

Some interns suggested a need for improvement; hence, the assessment for training was perceived to be insufficient.

I think there is always room for improvement and some things are your own responsibility like learning our people's language.

All of them may not have been formally assessed, but still I feel that there was enough opportunity to develop them.

One intern stated vehemently that

Nothing of undergraduate studies could have prepared me for the slavery and abuse of internship.

5.6 ASSESSMENTS PERCEIVED BY MEDICAL INTERNS TO BE INSUFFICIENT,

The perception reports regarding both sufficient and insufficient assessments are presented in Appendix F. This section will focus on areas interns perceived as insufficiently assessed, as reflected in Table 5.7.

Table 5.5: Interns survey on competency report concerning perceived insufficiency of assessment(s)

	PERCEIVED INSUFFICIENT ASSESSMENT		<i>IN MOST OF THE DEPARTMENTS, THERE WAS NO FORMAL ASSESSMENTS, MORE AN IMPRESSION MARK</i>
Were your medical expert competencies sufficiently assessed during the undergraduate medical programme? Yes = 91.5% No = 8.5%	Lack of assessment on ethical conduct	No emphasis on ethical conduct	They asked common emergencies and how to manage them and made sure you knew them should they present. However, the ethical side thereof was not really talked about or emphasised.
	Insufficient time	Lack of time for comprehensive assessment	There is little time for the full assessment of knowledge. There is also not always enough space for patient management or plans in the undergraduate programme, which can make one uncertain when truly having to decide on the specific management of the patient in front of you and the practical aspects around it.
Please explain your answer to Q 3.9	Superficial testing and rote learning	Standard of assessment is too low	I feel the minimum standard is too low. Real world is a lot harder. There is often enough teaching, but the testing is too superficial. It doesn't motivate anybody to build foundation knowledge. It only motivates for superficial knowledge that escapes as soon as you leave the hall.
	Subjective assessment	Lack of benchmark/standard for assessment	Sadly, at UFS marks are made up before you even enter the exam. Based on how well liked you are by the examiners, and if you bought the examiners coffee for ward rounds.
	<i>Miscellaneous</i>		IMA/MIMA helped me evaluate my patients as a person with multiple systems and not just medicine/surgery/ortho or even cardiology/respiratory etc. Important information for every department was highlighted. Communicator with patients and staff daily. Collaborator as part of a medical team including specialists and allied health daily. Leader in allied health teams as a central figure, Communicator, Collaborator, Leader, Health Advocate, Scholar, and Advocate, especially in obstetrics and gynae (contraception). Scholar: I often read up on diseases and expand my knowledge, and Professional in the way I conduct myself.
	<i>Repetitive learning</i>		And repetition is key in having confidence in performing skills adequately.

5.7 SUMMARY OF RESEARCH RESULTS

The triangulated data sources, document analysis, interviews with members of the school of medicine, and the medical interns' virtual survey indicate clear, common, emerging themes relating to challenges, gaps, and recommendations for the implementation and

assessment of AfriMEDS graduate competencies in the UFS MBChB programme.

Challenges and gaps that were identified are a) No formal assessment, especially where soft skills are required in leader and manager, advocate, collaborator, professional, communicator, and community-based education; b) Lack of time for clinical exposure and resources, such as staffing, training for staff, funding for benchmarking and innovation, i.e., use of electronic platform in assessment; and c) External factors: Clinical platform that is not well resourced and which exposes medical interns to harsh working conditions with high levels of stress and few coping mechanisms.

The recommendations relating to the common emerging themes are to create more time for practical exposure, to focus more on the quality of assessment than on quantity, to integrate learning between theory and practice, and to collaborate with other universities to standardise the approach to teaching and assessing graduate attributes. Furthermore, more clinical staff who are adequately trained in assessment should be appointed, including postgraduate students involved in student training (medical registrars).

The impact of COVID-19, which caused limitations for the study, also emerged as a strong common theme, which led to limited time for clinical exposure to patients, clinical platform constraints, and clinical staff being overburdened, which affected the quality of supervision for clinical training. It also resulted in ICT constraints in terms of internet connectivity to virtual teaching platforms, and access to data and devices for students and trainers, which prevented students from engaging meaningfully with students on virtual platforms.

5.8 CONCLUSION

The results of the study reveal a range of paradoxes: opportunities and missed opportunities, gains and losses, and quantity against quality in relation to the implementation and assessment of AfriMEDS graduate competencies. Missed opportunities include time, quality, and exposure.

There is acknowledgement that the theory of GAs is taught, though it is compromised by lack of time to practise and integrate theory with practice at the appropriate clinical phase of training. There is also lack of exposure to the right patients and environment, lack of formal continuous assessment of GAs, and assessment that is generally quantified, not

timely, summative, subjective, and superficial.

Chapter 6 will focus on the design of the AfriMEDS framework and guidelines to implement and assess them. This will be achieved through synthesis of emerging themes that emanated from this section and by integrating emerged themes with theory from the background and literature review reported in Chapters 1 and 2.

CHAPTER 6

EVALUATION OF AFRIMEDS COMPETENCIES

6.1 INTRODUCTION

The previous chapter presented the study findings related to the survey that was administered to medical interns who were completing either the first or second year of internship (medical residency) in 2020 and who had studied at UFS. The aim of Chapter 6 is to answer the main research question, namely: *How can the implementation and assessment of AfriMEDS physician competency framework in an undergraduate medical programme at UFS be evaluated?*

To address the main research question, a mixed-methods case study design involving quantitative and qualitative approaches was employed to gather data (*cf.* Figure 3.1 (a)). The results that were presented in Chapter 4 and Chapter 5 indicate convergence of the data collected and analysed through quantitative and qualitative methods, which follows the convergent parallel design (*cf.* Figure 3.1(a)). This approach was a mixed-methods approach that triangulated data from multiple sources. The purpose of triangulation was to seek convergence, corroboration, and correspondence of results from the different methods (*cf.* Section 3.4) (Greene, Caracelli & Graham, 1989). This approach contributed to the trustworthiness of the research (*cf.* Section 3.7.1).

The assertions made in the literature review in Chapter 2 and by empirical research confirm that GAs are the skills, competencies, qualities, and knowledge that higher education institutions should value. They should be embedded in academic programmes and pedagogical discourses, such as the curriculum, and co-curricular and extracurricular activities. The embedding of the GAs in the curriculum is a challenging exercise, as explained in Section 1.3.

The purpose of the AfriMEDS physician competency framework, as a key instrument to regulate the implementation of physician competencies in the African context, will be discussed in Section 6.2. Embedding the AfriMEDS physician competencies in the undergraduate medical curriculum characterises these competencies as an integral component of the curriculum and of the learning outcomes of a particular medical academic programme. Therefore, the AfriMEDS physician competency framework should guide the

planning of curricula, teaching, learning, and assessment methods.

6.2 PURPOSE OF THE AFRIMEDS PHYSICIAN COMPETENCY FRAMEWORK

The purpose of the AfriMEDS framework is to provide guiding, transformational learning principles that equip students with the competencies needed to address societal needs through community-based education and training, and community-oriented primary care in the context of Africa. It is about teaching and training for relevance while addressing the burden of disease and social determinants of health. AfriMEDS aims to provide guiding principles for educators so that they have a common understanding of physician competencies and their implementation at South African medical and dental schools. The framework explicitly outlines the set of skills and attributes that would ensure that graduates are successful in their academic endeavours and in their careers as healthcare professionals. Furthermore, the AfriMEDS framework emphasises the importance of teaching, learning, effective management of the curriculum, and assessment. It also has implications for faculty capacity and for ensuring that educators are adequately equipped with knowledge, skills, values, and resources that will enable them to improve their prospects of guiding their students to success.

After the AFriMEDS curriculum mapping has taken place, and the need has been identified to revise or transform the curriculum (*cf* 1.2, Figure 1.1), then, the AfriMEDS physician competency framework can be embedded into the curriculum. Medical schools ought to support their graduates to develop the attributes required by the health professions board, as well as by internship training.

6.3 CANMEDS DIAGRAM VS AFRIMEDS DIAGRAM

The CanMEDS framework identified and defined seven roles required of a competent physician, namely, medical expert, communicator, collaborator, leader, health advocate, scholar, and professional, as depicted in a diagram in Figure 6.1. The CanMEDS physician competency framework provides a unique and useful blueprint that was adopted by the ICMEC. However, even though the HPCSA and SACoMD have embraced this framework and named it AfriMEDS, the AfriMEDS framework lacks a graphical depiction (in the form of a diagram) that thematically embeds the Afrocentric orientation to CanMEDS framework and emphasis on community-based medical education, community-based education, and community-oriented care. Thus, the AfriMEDS graphical representation (Figure 6.2), within

the African context, it is the encapsulation of CanMEDS framework within the broader CBE roles while implementing COPC principles (*cf.*2.9).

The researcher developed the AfriMEDS framework diagram as illustrated in Figure 6.2, which expands on the CanMEDS framework: community-oriented care and community-based education complement the seven roles of CanMEDS. Not only is community emphasised in Figure 6.2, but it is also important to show how community-based education is integrated with COPC and seven key competencies in the proposed AfriMEDS framework diagram (*cf.* Figure 6.2).

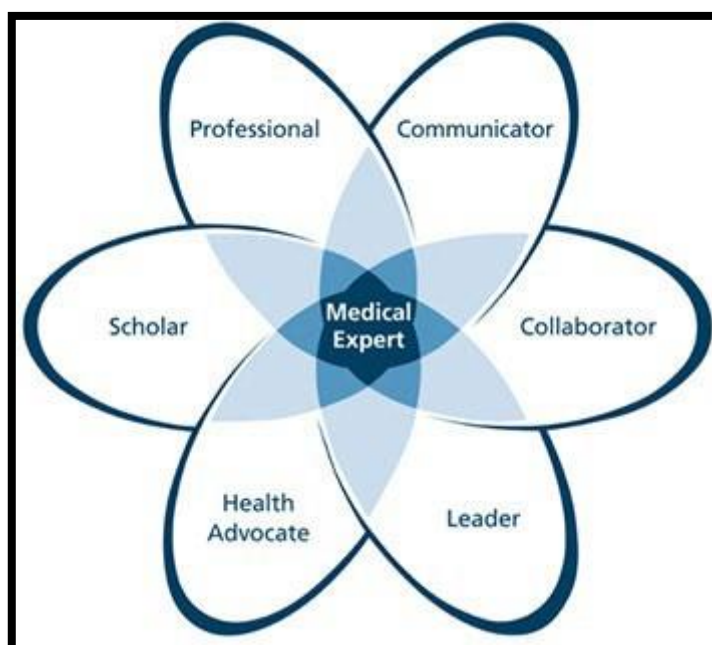


Figure 6.1: CANMEDS diagram and framework

The diagram and framework in Figure 6.1, which depicts the seven roles required of a competent physician, is officially trademarked and is reproduced with permission of the Royal College. The CanMEDS Framework has been integrated into the Royal College's accreditation standards, specialty training documents, final in-training evaluations, exam blueprints, and the Maintenance of Certification Programme.

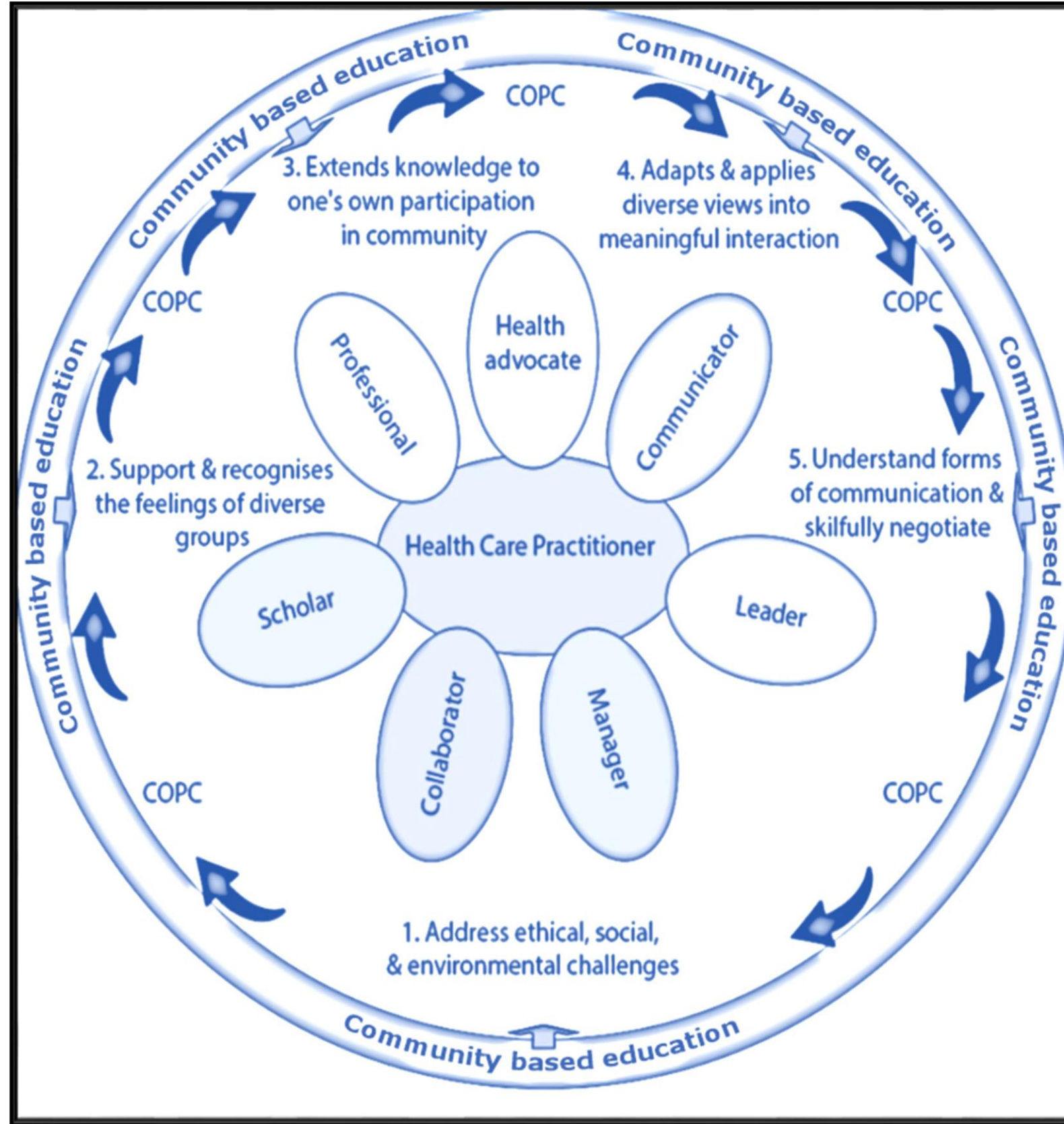


Figure 6.2: AfriMEDS graduate competency framework developed by the researcher

6.4 GUIDELINES TO EVALUATE AND ASSESS AFRIMEDS

In order to embed AfriMEDS in the curriculum, it is important to understand what is working well and what is not?

CanMEDS physician competency framework is best suited where there are small number of students, enough resources in terms of manpower, skills, infrastructure, adequate and appropriate clinical training platform.

There a number of intrinsic and extrinsic factors affecting the effective implementation of AfriMEDS in South African. Such factors are; the number of students per year or per phase, the number of adequately trained staff, the status of the clinical training platform, faculty resources; financial and administrative, and time allocation and the duration of the undergraduate programme.

In the context in terms of AfriMEDS, using UFS as a case study, UFS admits about 180 students per year, with a total undergraduate population of about nine hundred. The resource constraints in terms of staff, time, clinical training platform, finances and support are challenges that affects the effective implementation of AfriMEDS physician competency framework.

Clinical placement and work based assessments must be aligned per phase/rotation to instill AfriMEDS competencies. Figure 6.3. gives an example and guide on how to integrate the horizontal and vertical components of the AfriMEDS physician competency framework in order to delineate the process concepts of the AfriMEDS with the appropriate level of clinical placement.

It is important to delineate intrinsic and non-intrinsic AfriMEDS competencies when doing clinical placement. Clinical placement should identify subject, module, or discipline-specific competencies and categorise them according to the way they will be acquired in the best way in a teaching and learning environment. Intrinsic competencies can be acquired remotely throughout the duration of the undergraduate medical programme, whereas non-intrinsic competencies are acquired predominantly in clinical settings.

First, it is important for the university and faculty to agree on a list of GAs, which can be compiled through curriculum mapping in accordance with the AfriMEDS physician competencies. Educators align the learning outcomes per module or subject/discipline with the approved GAs.

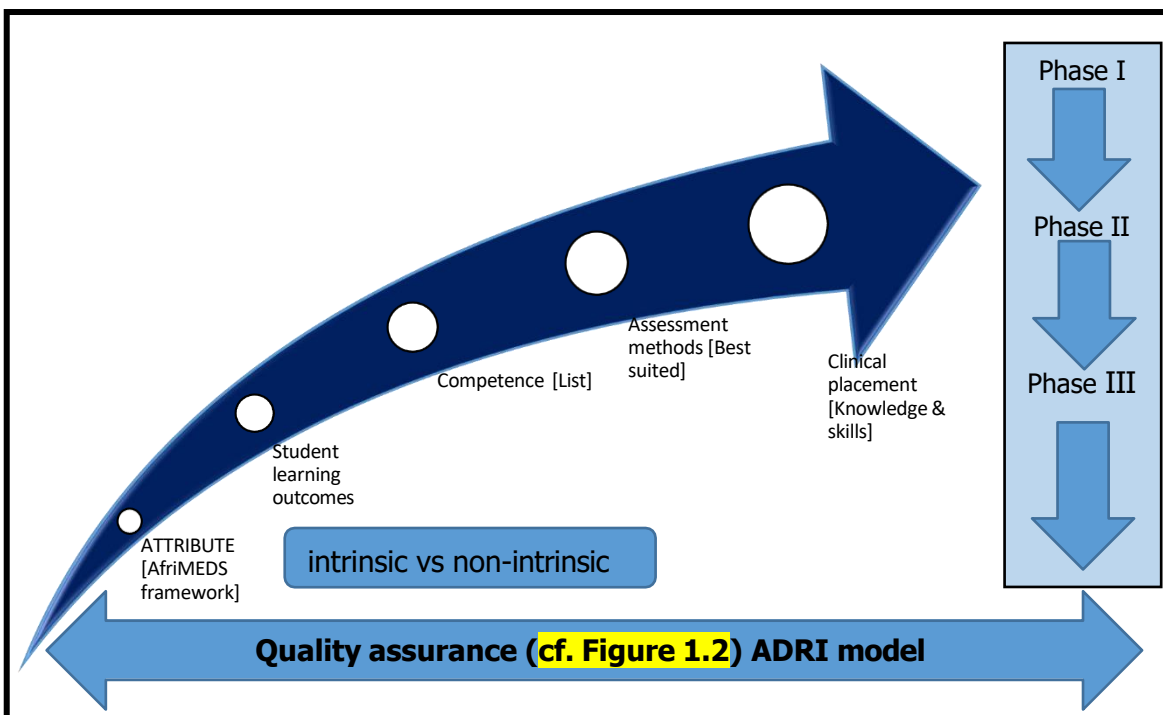


Figure 6.3: Guidelines to implement and assess the AfriMEDS framework compiled by the researcher

To implement the guidelines in Figure 6.3, the objectives that follow will need to be achieved.

Step 1: Use AfriMEDS core graduate competency framework

Identify the competencies associated with each of the attributes in knowledge, skills, and attitudes/behaviours as specified by the AfriMEDS for competent medical graduates and which depend on clinical placement. Use the HPCSA Accreditation Standards and Processes for medical graduates. The AfriMEDS and any other relevant reports/projects form the basis of the development of a document that maps competencies to prescribed attributes of CanMEDS and which enables graduates to practise from the start of MBChB until internship. The AfriMEDS GAs are the anchor point of the project and identify attributes that rely on clinical placement, and delineate competencies from these attributes.

The educator needs to check which skills should be instilled in students at every phase level. This process of identifying the GAs could take place through continuous consultations

with other educators of the same phase level and other module leaders, including phase chairs. Moreover, the educator should explore all possible avenues to embed AfriMEDS core competencies in every phase of the MBChB programme's academic activities.

Step 2: Identify the learning outcomes

Once educators have identified the skills and competencies they want to instill in students, they have to include these skills and competencies in the curriculum in the form of specific learning outcomes. Educators should add the AfriMEDS competencies to their subject outline and align them with assessment tasks that form part of the assessment criteria. The educator could do this by specifying that, at the end of a particular module, the students should be able to demonstrate certain topics. Doing so could assist in determining the extent to which students understand the learning content and the extent to which they could apply what they have learned in practice.

Step 3: Identify the competency list

Teaching and learning activities should ensure engagement of stakeholders in the identification and specification of competency lists. The development of the GAs requires effective teaching and learning processes, and points to the lists of core competencies to be attained. Teaching and learning require presentation of the competencies the student should acquire. At the same time, the educator is required to determine the best clinical placement for the students, where they will learn and acquire competency skills at the expected phase or level. The educator has to ensure that teaching and learning provide students with opportunities to apply the information they acquired in real-life situations.

Step 4: Identify the appropriate assessment method

After teaching and learning, the educator needs to identify the skills and competencies that the students have acquired. Educators should choose the appropriate assessment tools for each of the AfriMEDS competencies and develop rubrics. The educator must also ensure that the competencies are assessed appropriately so that a graduating medical student can commence work as an intern. Assessment could be done in the form of formative and summative assessments. The educator needs to give timely and constant feedback to students throughout their assessments so that students can reflect on their learning as it pertains to the AfriMEDS physician competencies. The use of e-portfolios has been found

to be practical and convenient to track learning throughout the duration of the programme.

Step 5: Identify the appropriate clinical placement

Ensure that the competencies enable a graduating medical student to continue to undertake further learning and clinical training throughout the undergraduate medical programme. This can be achieved through appropriate clinical placement, based on the principal objectives of the AfriMEDS competencies, by identifying and documenting competencies for the medical graduate outcomes required by the HPCSA and the undergraduate medical programme.

Step 6: Quality assurance

As part of the ADRI model in quality assurance (*cf.* Section 1.3.3), units of module or phase coordinators meet to evaluate marks and benchmark assessments before publishing the marks and grades. When marks are published, students can view attributes assessed by each task and subject, as well as their own progress against each of the AfriMEDS competencies. This step becomes part of the quality assurance process for improving the evaluation and assessment of AfriMEDS physician competencies.

6.5 CONCLUSION

The aim of this chapter was to address the main research question, namely: How can the implementation and assessment of the AfriMEDS physician competency framework in an undergraduate medical programme at UFS be evaluated?

The chapter presented the AfriMEDS framework diagram that was developed and the guidelines that were formulated in order to implement and assess them. Chapter 7, which is the last chapter, will consist of the conclusion, limitations of the study, and recommendations for future research.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

How to evaluate the implementation and assessment of the AfriMEDS physician competency framework in an undergraduate medical programme at UFS was provided in the penultimate chapter. The aim of this concluding chapter is to provide an overview of the study, synthesise the results of the study, and present the final findings, limitations of the study, recommendations, and conclusion. The purpose of presenting the findings relates to the main results that emerged from the literature review, document analysis, as well as from the empirical study conducted with educators and medical interns who had completed the UFS MBChB programme. These key findings serve the purpose of answering the basic research questions presented in Chapter 1 (Sections 1.4 & 1.5). The synthesis of the results is done with reference to the common themes that emerged from the triangulation of the qualitative and quantitative data sets.

7.2 AN OVERVIEW OF THE STUDY

The questions addressed by this research, which were outlined in Chapter 1 (*cf.* 1.5), are,

- i. How are AfriMEDS core competencies implemented and assessed in the UFS MBChB curriculum?*
- ii. Are UFS medical interns sufficiently trained and assessed in AfriMEDS core competencies?*
- iii. How can the implementation and assessment of AfriMEDS physician competency framework in an undergraduate medical programme at UFS be evaluated?*
- iv. Is AfriMEDS fit for purpose in producing healthcare professionals that are ready to serve and meet South African society needs?*

These questions guided the formulation of the final outcome of the study. The three questions posed above will be reviewed in the context of the main study findings.

7.2.1 Research question 1: How are AfriMEDS core competencies implemented and assessed in the MBChB curriculum?

This first research question will be answered in this subsection, to cover both implementation and assessment.

7.2.1.1 *Feedback from the document analysis and from educators*

The AfriMEDS core competencies are not equitably implemented across the three phases of the UFS medical programme (*cf.* Section 4.1.2; Tables 4.1 & 4.5). The assessment tools employed to evaluate core competencies are not consistent with benchmarked international best practices (*cf.* Appendix M). This finding is confirmed in the key themes and subthemes listed in Table 4.6, namely that:

- Assessment of core competencies is mostly informal;
- Assessment is disjointed and not well coordinated throughout the phases; and
- There are gaps in assessment, limited resources to support training and development, and too little clinical exposure.

Leader and manager, community-based medical education (and COP), scholar, communicator, collaborator, health advocate, and professional are reflected in the course modules, but there is no formal assessment which is benchmarked that is used (*cf.* Table 4.4 - 4.10; Appendix M).

It can thus be concluded from the research findings that the implementation of AfriMEDS core competencies is superficial, not integrated throughout the phases of the medical programme, and needs more resources in terms of manpower and infrastructure and clinical training support from faculty, the medical school, and clinical facilities, if it is to be successful (*cf.* Section 4.2.1).

7.2.2 Feedback by medical interns

Most of the medical interns rated the sufficiency of competencies very high (over 80% rated them positively), with the exception of leader and manager (63.5%), community-based education (71%), collaborator (72.5%), and communicator (79.9%) (*cf.* Tables 5.2).

Inadequate teaching of some aspects of undergraduate medical training was cited by some of the participants (*cf.* Section 5.4).

This is the summarised feedback from the medical interns concerning AfriMEDS physician competencies implementation and assessment.

Leader and manager competencies

Leader and manager competencies roles were generally scored low in almost all subsections (45.1-76.1%), except with functioning successfully in a resource-constrained environment (83%) and in understanding the SA healthcare system (80.3%) (*cf.* Figure 5.5). Litigation and adverse events in the SA healthcare system are on the increase, and it is threatening the government's ability to deliver healthcare to its citizenry.

The UFS MBChB programme and curriculum need major adjustment to implement the AfriMEDS competency role in terms of training on: (1) understanding the professional practice law, (2) to serve in leader and/or administrative roles, (3) managing medico-legal documentation, (4) prioritising the day's activities, (5) selection of drugs available in the hospital or clinic by considering cost against risk and benefits, and (6) coping with workplace stress.

Community-Based Education competencies

Community-Based Education competencies subsections were all generally not well scored by medical interns (71.4%) (*cf.* Table 5.3), which highlights the need to address this competency role in the UFS medical undergraduate programme (*cf.* Fig 5.9). The UFS medical curriculum should be transformed to infuse AfriMEDS community-based education competencies subsections: (1) how to interact with community leaders, (2) understanding community perspectives on their health needs, (3) knowing how to respond to the immediate healthcare needs of the community, (4) know how to communicate with patients from the community in their language, (5) learning basic language relevant to the community, and (6) knowing how to conduct community-based research. The community-based education competencies are what brings the Afrocentricity of the CanMEDS competency framework.

Collaborator competencies

Collaborator competency role subsections were overall well scored above 80% (72.5%) (*cf.* Table 5.4), with the exception of empathy towards the needs of nursing staff (*cf.* Figure 5.5). Quality patient care and management depend on harmonious interactions between the doctor and the nursing staff. Empathy and understanding others' needs is an important aspect that needs to be inculcated in the UFS MBChB programme and curriculum as part of the AfriMEDS collaborator role.

Communicator competencies

Communicator competency role was well rated (78.9%) (*cf.* Table 5.3), with only the subsection on presenting a mixed-methods case study to peers being rated high (94.36%). On the other hand, the subsection on evaluation and communication with family on illness (73.24%), appreciation of the importance of a patient's cultural and ethnic background (77.46%), feeling competent to counsel a distressed patient (67.61%), telling a patient that they have a terminal illness (73.24%), and dealing with relatives of patients in distressing situations and managing difficult patients (57.75%) were rated below 80% (*cf.* Figure 5.4). This highlights the inadequacy of the UFS MBChB programme and curriculum in adequately implementing and assessing the AfriMEDS communicator competency role. The proficiency to communicate with patients in their own African language where necessary is underrated throughout the UFS MBChB programme, even though it was emphasised and recommended by the HPCSA accreditation report (2019).

Scholar competencies

Scholar competencies were generally well scored (90.1%) (*cf.* Figure 5.7), although there were low scores in some subsections. The scholar competency subsection on interpretation and presenting of research data (66.2%), critical evaluation of research as it relates to clinical practice (69.0%), and planning and developing a research project (70.4%) (*cf.* Figure 5.7) are startling in that the UFS MBChB programme presents a research module (MSSM) at second year, where students form groups to undertake a research project under the supervision of an educator. This raises questions as to whether the research module is presented too early for students to appreciate it or whether group work can leave others isolated. How the research module is presented can be part of the curriculum review.

Health advocate competencies

This is one of the competencies that shows the strength of the UFS MBChB programme in implementing the AfriMEDS health advocate competency role, as it was generally well scored overall (78.3%) (*cf.* Figure 5.6).

Professional competencies

Professional competencies were generally well rated (84.3%) (*cf.* Table 5.3), with some areas of weakness in some subsections. Professional competencies show some areas of concern on coping with one's emotions (60.6%), knowledge of professional role and responsibility when confronted with social unrest (57.8%), and balancing work and personal life (43.7%) (*cf.* Figure 5.8). These results on professional competency highlight areas of intervention needed to be addressed in the UFS medical undergraduate programme. The AfriMEDS professional competency needs to be implemented, evaluated, and tracked in the curriculum.

Medical expert (integrator) competencies

Medical expert competencies were scored the highest (91.6%) above the rest (*cf.* Table 5.3). With respect to the medical or health expert competency role, which is the integrating role, medical interns felt that they were adequately trained and prepared for internship, except with conduct or assist with basic surgical procedures (77.5%), as only the score was below 80% (*cf.* Figure 5.2).

7.2.2.1 *How are AfriMEDS core competencies assessed?*

The intrinsic AfriMEDS core competencies, such as professional, leader and manager, health advocate, collaborator, and scholar, are barely assessed, even though communicator is well assessed. Communication in African languages (Sesotho, specifically, in the case of the Free State) is not assessed at all (*cf.* Section 4.2; Appendix M). Assessment tools are not benchmarked and lack consistency and relevancy (*cf.* Appendix M).

7.2.3 Research question 3: Are UFS medical interns sufficiently trained and assessed in AfriMEDS core competencies?

Medical interns showed a positive composite core competency score – between 80% and 100% – except for the overall internship experience scale, communicator, professional, community-based education, and leader and manager, where the majority had scores between 50% and 80% (*cf.* Table 5.3). Medical educators indicated that the domains of collaborator, professional, communicator (*cf.* Section 4.2.1.2), leader and manager role (*cf.* Section 4.2.1.1), and community-based medical education are areas of concern; participants did not agree that the leader and manager core competencies and community-based medical education competencies are included in the curriculum (*cf.* Table 4.5; Table 4.8).

The non-intrinsic medical expert expectation was rated highly by more than 80% of the interns who participated in the study (*cf.* Figure 5.2). All (100%) of the interns provided a positive response on comprehensive physical examination and carrying out basic procedures in wards. This confirms that non-intrinsic competencies are easier to implement and assess than intrinsic competencies, as confirmed by Whitehead et al. (2015) (*cf.* Section 1.3.3).

7.3 COMMON THEMES OF RESEARCH FINDINGS

This section will provide a discussion of the common and dominant themes that emerged from the empirical study as areas of concern.

The overall research objective in this study focused on developing guidelines; therefore, the quality assurance of GAs in student training is of paramount significance. This process of quality assurance was described in Section 1.3.3 and Figure 1.2, which give a synopsis of how GAs can be quality assured. By answering research questions and aligning with research aims and objectives, the study enabled the researcher to undertake the process of curriculum mapping, which is described in the diagram in Figure 1.1.

Faculty members in the school of medicine repeatedly admitted that the process of evaluating intrinsic competencies was informal, inconsistent, subjective, and artificial and lacked structure and standardisation. Even though the 15 faculty members that were interviewed provided a list of strategies they currently use to evaluate AfriMEDS GA

competencies (case presentation, logbook and portfolio, written and oral reports, teamwork, and tutorials), the most common response provided as a key theme was “no formal assessment”.

The challenges, barriers, and gaps that were identified (*cf.* Tables 4.6, 4.9 & 4.15) and that affect the effective implementation of AfriMEDS competency frameworks are lack of staff, increasing number of students, lack of time and resources to support benchmarking, and assessment tools. However, school of medicine staff are expected to demonstrate that they are assessing all AfriMEDS roles as part of the HPCSA accreditation process.

In the main, the three areas addressed by the AfriMEDS core competencies were found to be acceptable and relevant. All programmes perceived the immediate relevance of the medical expert, professional, and scholar domains. Some educators and interns initially expressed concerns about the quality of time spent in the community-based education, communicator, advocate, leader and manager domain, and all acknowledged the importance of these domains.

As mentioned in the conclusion of Chapter 5, the results of the study reveal a paradox of opportunities and missed opportunities, gains and losses, quantity against quality, in relation to the implementation and assessment of AfriMEDS graduate competencies. Missed opportunities relate to time, quality, and exposure. In the next sections, the researcher will reflect on these missed “golden” opportunities.

7.3.1 Time

The UFS medical school is the only medical school in South Africa that offers the MBChB as a five-year undergraduate medical degree. The triangulated data of the study identified time, or lack of time, as an obstacle to clinical time, teaching and training, and assessment. Medical curricula have long attracted criticism that they typically favour an emphasis on time spent rather than on abilities acquired (Long, 2000). The study findings report concerns by both academic staff and medical interns:

The development of the assessment tools because they make time and it's made for them.

There is also not always enough space for patient management or plans in the undergraduate programme, which can make one uncertain when truly having to decide on the specific management of the patient in front of you and the practical aspects around it.

Instead, the emphasis should be on the flexibility of time to acquire skills, as the speed at which students acquire knowledge and experience varies among individuals and over time. Thus, providing flexibility for the time in which students are to attain skills is seen to be much more effective than a time-based curriculum (Long, 2000; Carraccio et al., 2002; Frank et al., 2010(b)) (*cf.* Section 2.7.2). The insufficiency of clinical time spent on community-based education, interprofessional training, and integrated and coordinated follow-up of patients through the clinical years was cited as an area needing improvement by the HPCSA 2017 accreditation report (*cf.* Section 4.1.1; Appendix K(a)). Competencies take time to acquire and assess (*cf.* Appendix L, Limitations); hence, the undergraduate medical programme takes more than five years to complete.

There is, therefore, a need to review the time and duration of the UFS MBChB programme as part of curriculum transformation to make it relevant to effective implementation of AfriMEDS physician competency framework.

7.3.2 Quality

The quality of training and supervision, the quality of the clinical platform, and the quality of assessment are key elements of quality assurance in the UFS MBChB programme.

It was mentioned in Chapter 4 that the UFS medical curriculum is intense regarding theory and the amount of assessment but lacked quality in terms of clinical supervision, training, and assessment. As explained in Chapter 1 (*cf.* Section 1.3) concerning success factors that ensure the implementation of GAs by UFS, quality GAs will result from the alignment of policies, programmes, and practices throughout the institution (UFS, 2018). The proposed curricular and co-curricular mapping exercise (*cf.* Figure 1.1) is, therefore, critical for creating a sustainable approach to GA development. In an interview, a staff member said,

I think it is absolutely imperative that all staff involved in student training and assessment should also be trained in assessment is a very important component of ensuring quality, and ensuring effective teaching, learning and assessment.

The curriculum mapping and review exercise revealed that there is a misalignment of the UFS MBChB graduate profile and the AfriMEDS GA domains in terms of implementation and assessment (*cf.* Tables 4.6, 4.7, 4.8, 4.9, 4.10, 4.13 & 4.14, Appendix M).

Medical interns rated the sufficiency of competencies very high (over 80%) on closed-ended questions (*cf.* Table 4.6), with the exception of leader and manager (63%), community-based education (71%), collaborator (72%), and communicator (79%). However, the responses to open-ended questions identified a number of gaps, barriers, and challenges, including areas for improvement (*cf.* Table 4.13).

Table 4.1 shows that the clinical phase of the programme had less emphasis on embedding the graduate core competencies of the AfriMEDS, particularly in relation to the competencies of collaborator, scholar, leader and manager, health advocate, and communicator in the advanced phase of the programme, Phase III, with the exception of community-based education. This observation is confirmed by the HPCSA 2018 report, which recommends that the MBChB programme falls short on the following classified categories of the AfriMEDS GA framework: communicator, collaborator, health advocate, leader and manager, and community-based education. These findings confirm the study by Whitehead et al., 2015:246), (*cf.* Section 1.3.2), "that some competencies are easier to teach and assess, especially those related to the medical expert role, while other competency roles seem to be more challenging to assess". The CanMEDS roles of advocate and collaborator are difficult to assess, as there are a number of intrinsic and extrinsic factors at play that involve interactions that can affect performance.

From Table 4.6, key areas of research questionnaire and themes, and from challenges and recommendations expressed by members of the school of medicine, the need for (a) benchmarked, standardised assessment tools, (b) more trained staff to implement the tools, and (c) more clinical time and relevant clinical exposure is clear.

The use of an electronic platform, such as e-portfolios was also mentioned, but these needed financial resources with support from the school's and faculty management.

It is, however, important to note that by addressing issues of quality, it enhances the accreditation requirements and processes of the HPCSA. It is the mandate of the SACoMD and the HPCSA to ensure that all medical schools adhere to the AfriMEDS physician competency framework in the training of medical, dental, and clinical associate students in South Africa.

7.3.3 Exposure

Clinical exposure is closely linked to and interrelated with time and quality. Exposure to learn patients' own languages, soft skills, and attributes needed for counselling, and engagement with communities were cited as areas of concern. Soft skills need to be entrenched and followed throughout the duration of the programme. As previously mentioned, soft skills are not easy to teach and evaluate (*cf.* 1.3.2).

Furthermore, it is important to note the following feedback from the educators (*cf.* 4.10):

The other thing that students need is more clinical exposure. People should be able to translate the knowledge that they get through simulation also in the physically environment.

A decline in work-based clinical exposure was cited as a gap that hinders the attainment of learning patients' own language, soft skills and counselling skills (undergraduate medical programme in South Africa poses unique challenges for the medical school and requires management intervention in terms of curriculum review). These obstacles are compounded further on the one hand by the need to decolonise the curriculum, which has become a requirement of the higher education department. On the other hand, it is the need to adapt and incorporate the 4th and 5th Industrial Revolutions. This is an enormous task, as educators and students will have to be retrained, curriculum realigned, and teaching pedagogy transformed.

Clinical exposure should be integrated throughout all three phases of the UFS undergraduate medical programme. Clinical competencies are acquired progressively; they develop over time, are dynamic, and are dependent on contextual aspects, learning, and the clinical setting (Frank et al., 2010(b)).

It is important to mention, however, that clinical exposure is phase- and discipline-specific. Each clinical phase and individual discipline need to ensure that their exit learning outcomes are aligned to the AfriMEDS physician competency framework. The assessment should also be aligned to ensure the best benchmarked assessment methods are utilised. The use of portfolios or work-based assessment methods are therefore critical towards curriculum transformation, which ultimately has an impact on programme delivery.

7.4 CONCLUSION

It can be concluded that, without relevant subject, module, or discipline-specific guidelines graded according to the clinical spectrum to evaluate and assess the AfriMEDS physician competency framework, all planning, organisation, and implementation thereof may be a futile and ineffective exercise, as this will not fully assess the AfriMEDS elaborately.

South African undergraduate medical programmes and higher education institutions should develop policies to promote AfriMEDS physician competencies and GAs, which have a direct focus on encompassing all core competencies in educational activities and curricula. Student centredness determines that attributes earmarked for graduates to acquire in the environment of higher education should be central to any activity which concerns them. Without actively acknowledging the determinants of successful implementation of GAs as a nucleus in an organisation, management or governance of a university or college, no real achievement and accomplishment by teaching and learning will be feasible.

7.5 VALUE OF THE STUDY

The significance of the study is three-fold. First, it developed a graphical demonstration of the way the epistemological context of the AfriMEDS physician competency framework can be evaluated in the context of African communities in order to address societal needs. Secondly, it developed guidelines for evaluating and assessing the AfriMEDS framework. These guidelines provide recommendations that are adaptable and can be implemented in teaching and learning designed for undergraduate medical training on the African continent and in other countries. Thirdly, the triangulation of data from a mixed-methods case study design highlighted that higher education in South Africa in medical training can be transformed by adopting a transformative research paradigm approach. Transformative research paradigm seems to be a suitable framework for transforming community-based medical education and in aligning the relevancy of training future medical doctors to meet community expectations.

7.6 LIMITATIONS OF THE STUDY

Research limitations were also addressed in Chapter 3 (*cf.* Section 3.10.1).

Although the research was planned, organised, and executed according to sound scientific

principles, a number of limitations and shortcomings emerged during the course of the project.

- The first issue was related to communication. To communicate with the educators and students was a challenge. It took some time before a proper communication line was established. Some students did not have functioning telephone lines and valid email addresses, and many were no longer using their university-assigned email addresses, since they were no longer registered as students during their internship.
- Another limitation related to participating educators, as their availability to participate in online interviews was limited due to their heavy workloads.
- The participation rate of interns in the online questionnaires was lower than anticipated. UFS was the only medical school used as a case to conduct this study.
- COVID-19 has had a global impact. Even though there were no direct questions related to it, the impact of COVID-19 on the study was a significant theme that emerged even though the study did not focus on it; this was probably due to the timing of the study.

7.7 RECOMMENDATIONS FOR FURTHER RESEARCH

The AfriMEDS physician competency framework implementation and assessment guidelines need to be quality assured for quality improvement. Quality assurance evaluation could be done through the convergence of medical educators in South Africa that represent all medical schools. Medical educators could determine criteria that are based upon the guidelines identified by this study to evaluate the AfriMEDS framework. After every cycle of determined time, the medical educators could meet and perform the evaluation of the quality and relevance of the AfriMEDS guidelines.

The following recommendations are made for future research:

- The study can be broadened to include other medical schools. Doing so will require key stakeholder involvement, which can be solicited through the permission and support of SACoMD. This inclusion will be useful, as the process will involve a standardised approach to embedding the AfriMEDS physician competency framework.
- The policy for access to admission and selection to medical schools could be aligned with AfriMEDS core competencies, especially regarding communication and promoting African languages for communicating with Black African patients.
- A medical council should work with medical school deans to ensure that a career in

medicine is open to anyone who has the right AfriMEDS attributes to be a doctor, by setting minimum entry and social justice requirements to standard entry, without infringing on the autonomy of medical schools. This will require policy conceptualisation and stakeholder consultation with SACoMD for policy buy-in and ratification. It will also require that each undergraduate medical programme provides a graduate profile, which is then mapped to the AfriMEDS graduate domains to ensure alignment with the university and HPCSA expectations of graduates.

- A programme tracking system should be developed to track clearly the stipulated graduate profiles, evidence of achievement, and the way the AfriMEDS framework is embedded in the curriculum. This could be ensured through the quality assurance process (*cf.* Figure 1.2). Incorporating the AfriMEDS framework into the curriculum components would be done by providing portfolios of evidence that link assessment to the core competency list.
- The development of e-portfolios can be a convenient way to track and assess the AfriMEDS physician competency framework, as specified in the learning outcomes. The e-portfolio must be easy to use and be flexible enough to enable students to reflect and build upon competencies throughout the undergraduate medical programme. A university's ICT platform should support the faculty and the undergraduate medical programme in the implementation of the GAs and the implementation of the e-portfolio.

7.8 CONCLUDING REMARKS

The aim of the study was to evaluate the implementation and assessment of AfriMEDS physician competency framework in an undergraduate medical programme at UFS. The researcher presented the findings and made recommendations based on the literature review and the empirical investigation, which culminated in AfriMEDS diagram model framework and guidelines. Synthesis of the AfriMEDS framework and its applicability to the UFS undergraduate medical programme was established. The intention was to gain insight from the perceptions of students and educators pertaining to the training and assessment of the AfriMEDS GAs. Although the study was both interesting and challenging, there is still much work to be done in African medical education and training. It is the researcher's sincere hope that this study will attract more research interest and that it will lead to the quality of training that medical students get improving.

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APPENDICES

Appendix A: Sample questions used for online questionnaire for medical interns

Appendix B: Semi-structured online interview guide for educators/phase chairs/programme manager/director

Appendix C: Information letter and consent letters to medical interns

Appendix D: Consent to participate in research

Appendix E: Consent to audio recording and transcription

Appendix F: Demographic and perceived competency data

Appendix G: Items and the reliability values and descriptive analysis of scales

Appendix H: Interns experience during the overall internship period

Appendix I: Open-ended question data on medical interns' online survey

Appendix J: UFS 2020 Rules undergraduate medical programme

Appendix K: HPCSA UFS MBChB Accreditation Report 2017

Appendix L: Additional information on core competency scales

Appendix M: Definitions of assessment methods and their comparison

SAMPLE QUESTIONS USED FOR ONLINE SURVEY FOR MEDICAL INTERNS

INTERNS' PERCEPTION ON WHETHER THEY WERE SUFFICIENTLY PREPARED

Questionnaire

1. DEMOGRAPHICS

1.1 Personal

1.1.1 Age

1.1.2 Gender

Male	1	Female	2
------	---	--------	---

1.1.3 Race

1	African
2	White
3	Asian
4	Coloured
5	Other/Unspecified

1.1.4 Institution of undergraduate training

1	University of the Free State
2	University of Cape Town
3	University of Pretoria
4	University of Witwatersrand
5	University of KwaZulu-Natal
6	University of Western Cape
7	University of Limpopo
8	Stellenbosch University
9	Walter Sisulu University
10	Foreign university

1.2 Internship

1.2.1 Which year of internship are you currently?
.....

1.2.2 In which province are you completing your internship?
.....

1.2.3 At which institution are you doing your internship?
.....

1.3 Education

1.3.1 University where you completed your undergraduate study?
.....

1.3.2 In which year did you complete your studies?
.....

1.3.3 At this moment, which specialisation are you considering?
.....

2. INTERNSHIP EXPERIENCE

		Agree	Neutral	Disagree
2.1	I was well orientated to my job by the hospital staff when I arrived	1		
2.2	I have experienced good clinical supervision during my internship	1		
2.3	My seniors have always been available when I needed help	1	1	1
2.4	I have coped well psychologically this year	1	2	
2.5	I have a positive attitude towards public service due to my internship	1	2	3
2.6	I always knew what was expected of me	1	2	
2.7	I feel I was sufficiently prepared for internship during my tertiary studies	1	2	

3. SUFFICIENCY OF THE UNDERGRADUATE TRAINING

Please mark the correct option under each of the following questions.

My undergraduate medical training sufficiently prepared me to:

3.1 Medical Expert

		Agree	Neutral	Disagree
3.1.1	Apply my knowledge of basic sciences to clinical conditions	1	2	
3.1.2	Demonstrate efficient and appropriate use of diagnostic procedural skills	1		1
3.1.3	Carry out a comprehensive physical examination	1	1	
3.1.4	Draw up a comprehensive assessment of a patient	1	2	
3.1.5	Carry out basic procedures in wards (drips, catheters)	1	?	
3.1.6	Conduct/assist with basic surgical procedures	1	2	
3.1.7	Handle clinical emergencies	1	2	3
3.1.8	Show efficient and appropriate use of diagnostic procedural skills	1	2	3

3.2 Communicator

		Agree	Neutral	Disagree
3.2.1	Evaluate and communicate family factors on illness	1	2	1
3.2.2	Appreciate the importance of a patient's cultural and ethnic background	1	2	
3.2.3	Show empathy regarding poverty and unemployment on illness of patients	1	1	
3.2.4	Feel competent to counsel a distressed patient	1	7	
3.2.5	Able to tell a patient that they have a terminal illness	1		
3.2.6	Deal with relatives of patients in distressing situations	1	2	3
3.2.7	Able to manage difficult patients	1	2	3

3.2.8 Know how to present a case/study to peers

3.3 Collaborator

3.3.1 Work in interprofessional teams

3.3.2 **Able to approach senior staff for assistance when uncertain**

3.3.3 Work with allied health professionals to develop a **comprehensive patient management plan**

3.3.4 **Be empathic towards the needs of nursing staff**

3.3.5 Understand the importance of group dynamics

3.3.6 **Successfully communicate with other professionals**

Agree	Neutral	Disagree
		1
1	2	
	7	
1	9	3

3.4 Leadership & Management

3.4.1 Understand professional practice laws

3.4.2 **Able to serve in leadership and/or administrative roles**

3.4.3 **Function successfully in resource-constrained environments**

3.4.4 Understand the SA health system

3.4.5 **Able to manage medico-legal documentation**

3.4.6 Able to prioritise my day's activities

3.4.7 **Able to select drugs by considering the cost vs risks vs benefits**

3.4.8 Cope with stress in the workplace

Agree	Neutral	Disagree
	2	3
	1	
	2	3
1	2	
1	2	1
		0

3.5 Advocate

3.5.1 **Take responsibility for the care of a patients**

3.5.2 Provide education to a patient

3.5.3 **Able to implement prevention and promotion in treatment plan**

3.5.4 **Discuss relevant preventive health strategies with patients**

3.5.5 **Treat each patient as an individual**

3.5.6 Advocate for patients

3.5.7 **Discuss health risks with patients**

Agree	Neutral	Disagree
	1	
1	9	1
	1	
	9	
	2	

3.6 Scholar

3.6.6 **Able to continually evaluate my own performance**

3.6.1 **Recognise my own clinical limitations**

3.6.2 **Appreciate the importance of lifelong learning**

Agree	Neutral	Disagree
		1
1		1

- 3.6.3 Reflect on my own learning needs
- 3.6.4 Invest time in developing my skills
- 3.6.5 Evaluate my learning experiences
- 3.6.7 Critically evaluate research as it relates to *my* clinical practice
- 3.6.8 Plan and develop a research project
- 3.6.9 Analysis, interpretation and presentation of research data

1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3

3.7 Professional

- 3.7.1 Maintain attitudes appropriate to the practice of my profession
- 3.7.2 Behave in a calm manner in difficult situations
- 3.7.3 Record clinical data systematically
- 3.7.4 Know how to approach ethical dilemmas
- 3.7.5 Cope with my own emotions in distressing clinical situations
- 3.7.6 Know my professional role and responsibility in the event of social protest
- 3.7.7 Balance my work and personal life
- 3.7.8 Understand plagiarism and intellectual property
- 3.7.9 Appreciate privacy and autonomy

Agree	Neutral	Disagree
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3

3.8 Community Engagement

- 3.8.1 Know how to interact with community leaders
- 3.8.2 Understand population perspective
- 3.8.3 Know how to respond to the healthcare needs of my immediate community
- 3.8.4 Know how to communicate with patients from the community
- 3.8.5 Learned basic language skills relevant to my community
- 3.8.5 Know how to conduct community based research

Agree	Neutral	Disagree
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3

4, REFLECTIONSON THE ASSESSMENTDURING YOURSTUDIES

4.1 Do you feel the assessment was sufficient during the undergraduate programme?

Yes

4.1.1 Please explain your answer

4.2 **Were the consultation competencies sufficiently assessed during your studies?**

Yes

4.2.1 **Please explain your answer in 4.2**

4.3 **Were your surgical competencies sufficiently assessed during your studies?**

Yes

4.3.1 **Please explain your answer in 4.3**

4.4 **Were your communication competencies sufficiently assessed during your studies?**

Yes

4.3.1 **Please explain your answer in 4.4**

4.4 **Were your Management & Leadership competencies sufficiently assessed?**

Yes

4.4.1 **Please explain your answer in 4.4**

4.5 **Were your Advocate competencies sufficiently assessed?**

Yes

4.5.1 **Please explain your answer in 4.5**

4.6 **Were your Scholarly competencies sufficiently assessed?**

Yes

4.6.1 **Please explain your answer in 4.6**

4.7 Were your Professional competencies sufficiently assessed?

Yes

4.7.1 Please explain your answer in 4.7

4.8 Were your Community Engagement competencies sufficiently assessed?

Yes

4.8.1 Please explain your answer in 4.8

4.8 Were your Community Engagement competencies sufficiently assessed?

Yes

4.8.1 Please explain your answer in 4.8

Programme Directors / Module Leaders / Phase Chairs
Questionnaire

1. UNDERGRADUATE PROGRAMME INVOLVEMENT

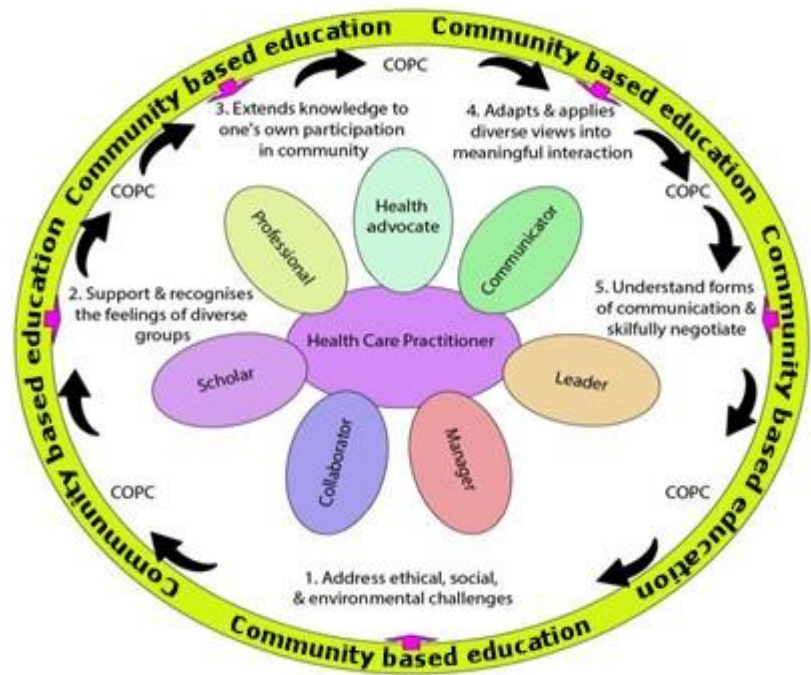
1.1 Phase

1.1.1 Which phases of the programme are you involved in?

Phase 1	Phase 2	Phase 3
---------	---------	---------

2. ASSESSMENT EFFICIENCY

Consider the following graph derived from the CanMED and SACBME framework models:



AfriMEDS framework model

2.1 In the modules you are involved in, do you include training for the following competencies?

		Yes	No	Not sure
2.1.1	Collaborator	1	2	3
2.1.2	Communicator	1		
2.1.3	Scholar	1		3
2.1.4	Leader and Manager	1		
2.1.5	Professional	1	2	3
2.1.6	Community engagement	1	2	3
2.1.7	Community based medical education	1	2	

2.2 In the study phase you are involved in, how do they assess the following competencies?

- 2.2.1 Collaborator
- 2.2.2 Communicator
- Scholar
- 2.2.4 Leader and Manager
- 2.2.5 Professional
- 2.2.6 Community engagement
- 2.2.7 Community based medical education

2.3 What barriers and/or challenges have your school of medicine members identified or experienced with regard to using assessment tools in the teaching and learning environment?

2.3.1 Collaborator

2.3.2 Communicator

2.3.3 Scholar

2.3.4 Leader and Manager

2.3.5 Professional

2.3.6 Community engagement

2.3.7 Community based medical education

2.4 What gaps have your school of medicine members identified in assessing students' competencies with regard to the roles?

2.4.1 Collaborator

2.4.2 Communicator

2.4.3 Scholar

2.4.4 Leader and Manager

2.4.5 Professional

2.4.6 Community engagement

2.4.7 Community based medical education

2.5 Have your school of medicine members identified or adhered to any best practices with regard to assessing the roles?

2.5.1 Collaborator

2.5.2 Communicator

2.5.3 Scholar

2.5.4 Leader and Manager

2.5.5 Professional

2.5.6 Community engagement

2.5.7 Community based medical education

2.6 What do your school of medicine members need to be more effective at assessing their students' competencies with regard to the roles?

2.6.1 Collaborator

2.6.2 **Communicator**

2.6.3 Scholar

2.6.4 Leader and Manager

2.6.5 **Professional**

2.6.6 **Community engagement**

2.6.7 **Community based medical education**

2.7 How can management support your school of medicine to be more effective at assessing the students' **competencies with regard to the roles?**

2.7.1 Collaborator

2.7.2 **Communicator**

2.7.3 Scholar

2.7.4 Leader and Manager

2.7.5 **Professional**

2.7.6 **Community engagement**

2.7.7

Community based medical education

Thank you

INFORMATION LETTER AND CONSENT LETTERS TO MEDICAL INTERNS

Project title: Evaluating the implementation and assessment of the AfriMEDS competencies in the UFS undergraduate medical programme

Researcher: N Mofolo

Dear participant

The University of the Free State, School of Clinical Medicine is doing research to evaluate the implementation and assessment of AfriMEDS graduate competencies in its undergraduate MBChB programme during your two-year internship programme.

The study is done in cooperation with the MBChB undergraduate programme of the University of the Free State.

Research is just the process to learn the answer to a question.

The objectives of the study are:

1. To review the undergraduate training experience and how well it prepared you towards medical internship.
2. To reflect on the assessment during your undergraduate studies.
3. To reflect on your working experience as a medical intern who studied at UFS.

We are asking/inviting you to participate in a research study by completing the online questionnaire. A cross-sectional study design was used, which means a simple questionnaire, but also include a few qualitative-type open-ended questions.

The research holds no risks for you as individual. You may keep this information letter as well as a copy of the questionnaire.

Participation is voluntary, and you may withdraw from participation at any stage without penalty or loss of any benefits.

Confidentiality: All information be handled confidentially. Results may be published, but no personal identifiable information be included in the final report.

There is no cost payable by the participants or remuneration payable to participants for participation in the study.

The questionnaire will take the participant between 10 and 15 minutes to complete.

For further information/reporting of study-related adverse events you are free to contact Prof N Mofolo at 051 401 7709 or email to MofoloN@ufs.ac.za.

Contact details of the Secretariat and Chair: Ethics Committee of the Faculty of Health Sciences, University of the Free State for reporting of complaints/problems are (051) 4052812.

Prof N Mofolo
School of Clinical Medicine, UFS

CONSENT TO PARTICIPATE IN RESEARCH

Project title: Evaluating the implementation and assessment of the AfriMEDS competencies in the UFS undergraduate medical programme

You have been asked to participate in a research study.

You have been informed about the study by Prof N Mofolo.

You may contact Prof. N Mofolo at (051) 401 7790 or MofoloN@ufs.ac.za at any time if you have questions about the research.

You may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at telephone number (051) 4052812 if you have questions about your rights as a research subject.

Your participation in this research is voluntary, and you will not be penalised or lose benefits of any type if you refuse to participate or decide to terminate participation.

If you agree to participate, you may keep a copy of this document, the participant information sheet, as well as a copy of the questionnaire.

Information will be kept confidential. No identifiable personal information will be used in any reports or possible publications.

I understand what is expected of me in this research study. I have read the information letter and the above information. I understand what my involvement in the study means and I voluntarily agree to participate.

Participant's Signature: _____

Date: _____

CONSENT TO AUDIO RECORDING AND TRANSCRIPTION

Project title: Evaluating the implementation and assessment of the AfriMEDS competencies in the UFS undergraduate medical programme

You have been asked to participate in a research study.

You have been informed about the study by Prof N Mofolo.

You may contact Prof. N Mofolo at (051) 401 7790 or MofoloN@ufs.ac.za at any time if you have questions about the research.

You may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at telephone number (051) 4052812 if you have questions about your rights as a research subject.

This study involves the audio or video recording of your interview with I. Neither your name nor any other identifying information will be associated with the audio or audio recording or the transcript. Only the research team will be able to listen (view) to the recordings.

The tapes will be transcribed by I and erased once the transcriptions are checked for accuracy. Transcripts of your interview may be reproduced in whole or in part for use in presentations or written products that result from this study. Neither your name nor any other identifying information (such as your voice or picture) will be used in presentations or in written products resulting from the study.

By signing this form, I am allowing I to audio or video tape me as part of this research. I also understand that this consent for recording is effective until the following date: _____. On or before that date, the tapes will be destroyed.

Participant's Signature: _____

Date: _____

APPENDIX F

DEMOGRAPHIC, EXPERIENCE AND PERCEIVED COMPETENCY DATA OF MEDICAL INTERNS

INTERNSHIP PARTICIPATING PROVINCES

PROVINCE NAME	n	%
Eastern Cape	13	18.31
Free State	16	22.54
Gauteng	10	14.08
KwaZulu-Natal	8	11.27
Limpopo	0	0
Mpumalanga	3	4.23
Northern Cape	4	5.63
North West	10	14.08
Western Cape	7	9.86

AREAS OF POSSIBLE SPECIALISATION

SPECIALISATION AREA	n	%
Q1.8 Chemical Pathology	0	0.00
Q1.8 Clinical Pharmacology	0	0.00
Q1.8 Medical Virology	0	0.00
Q1.8 Nuclear Medicine	0	0.00
Q1.8 None	1	1.41
Q1.8 Anatomical Pathology	1	1.41
Q1.8 Clinical Pathology	1	1.41
Q1.8 Forensic Medicine	1	1.41
Q1.8 Medical Genetics	1	1.41
Q1.8 Medical Microbiology	1	1.41
Q1.8 Clinical Imaging Sciences	2	2.82
Q1.8 Haematology and Cell Biology	2	2.82
Q1.8 Cardiothoracic Surgery	3	4.23
Q1.8 Community Health	3	4.23
Q1.8 Dermatology	3	4.23
Q1.8 Neurosurgery	3	4.23
Q1.8 Oncology	4	5.63
Q1.8 Otorhinolaryngology	5	7.04
Q1.8 Plastic Surgery	5	7.04
Q1.8 Other, not listed here (please specify in Q1.9 below)	5	7.04
Q1.8 Neurology	6	8.45
Q1.8 Obstetrics/Gynaecology	6	8.45
Q1.8 Ophthalmology	6	8.45
Q1.8 Psychiatry	7	9.86
Q1.8 Family Medicine	8	11.27
Q1.8 Orthopaedic Surgery	8	11.27
Q1.8 Surgery	9	12.68
Q1.8 Do not consider specialisation at this stage	10	14.08
Q1.8 Urology	11	15.49
Q1.8 Emergency Medicine	12	16.90
Q1.8 Paediatrics	16	22.54
Q1.8 Internal Medicine	17	23.94
Q1.8 Anaesthesiology	22	30.99

OVERALL INTERNSHIP EXPERIENCE

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
I was well oriented (n=71)	8 (11.27)	47 (66.2)	55 (77.47)
Experienced good clinical supervision (n=71)	16 (22.54)	48 (60.56)	64 (83.1)
My Seniors have been available (n=71)	15 (21.13)	45 (63.38)	60 (84.51)
I Copied well psychologically (n=71)	14 (19.72)	27 (38.03)	41 (57.75)
I have a positive attitude towards public service (n=71)	10 (14.08)	21 (29.58)	31 (43.66)
I know what was expected of me (n=71)	11 (15.49)	49 (69.01)	60 (84.5)
I feel that I was sufficiently prepared (n=71)	20 (28.17)	37 (52.11)	57 (80.28)

MEDICAL EXPERT/INTERGRATOR COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.1 Apply my knowledge of basic sciences in managing/diagnosing clinical conditions	16 (22.54)	49 (69.01)	65 (91.54)
3.2 Demonstrate appropriate use of diagnostic procedural skills	20 (28.17)	47 (66.2)	67 (94.37)
3.3 Carry out a comprehensive physical examination	35 (49.3)	36 (50.7)	71 (100.0)
3.4 Draw up a comprehensive assessment of a patient	22 (30.99)	42 (59.15)	64 (90.14)
3.5 Carry out basic procedures in wards (drips, catheters, etc.)	51 (71.83)	20 (28.17)	71 (100.0)
3.6 Conduct/assist with basic surgical procedures	21 (29.58)	34 (47.89)	55 (77.47)
3.7 Manage medical emergencies	15 (21.13)	43 (60.56)	58 (81.69)
3.8 Show appropriate use of diagnostic procedural skills	14 (19.72)	48 (67.61)	62 (87.33)

COMMUNICATOR COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.11 Evaluate and communicate family factors on illness	13 (18.31)	39 (54.93)	52 (73.24)
3.12 Appreciate the importance of a patient's cultural and ethnic background	12 (16.9)	43 (60.56)	55 (77.46)
3.13 Show empathy regarding poverty and unemployment on illness of patients	17 (23.94)	45 (63.38)	62 (87.32)
3.14 Feel competent to counsel a distressed patient	16 (22.54)	32 (45.07)	48 (67.61)
3.15 Tell a patient that they have a terminal illness	9 (12.68)	43 (60.56)	52 (73.24)
3.16 Deal with relatives of patients in distressing situations	1 (1.41)	40 (56.34)	41 (57.75)
3.17 Manage difficult patients	6 (8.45)	41 (57.75)	47 (66.2)
3.18 Know how to present a mixed-methods case study to peers	23 (32.39)	44 (61.97)	67 (94.36)

COLLABORATOR COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.21 Work in interprofessional teams	18 (25.35)	48 (67.61)	66 (92.96)
3.22 Approach senior staff for assistance when uncertain	20 (28.57)	43 (61.43)	63 (90.00)
3.23 Work with health and rehabilitation sciences professionals to develop a comprehensive patient management plan	17 (23.94)	41 (57.75)	58(81.69)
3.24 Be empathic towards the needs of nursing staff	6 (8.45)	40 (56.34)	46 (64.79)
3.25 Understand the importance of group dynamics	12 (17.14)	49 (70.00)	61 (87.14)
3.26 Successfully communicate with other health professionals	15 (21.43)	49 (70.00)	64 (91.43)

LEADER AND MANAGER COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.29 Understand professional practice laws	7 (9.86)	31 (43.66)	38 (53.52)
3.30 Serve in leader and/or administrative roles	6 (8.45)	42 (59.15)	48 (67.6)
3.31 Function successfully in resource-constrained environments	18 (25.35)	41 (57.75)	59 (83.1)
3.32 Understand the SA healthcare system	11 (15.49)	46 (64.79)	57 (80.28)
3.33 Manage medico-legal documentation	4 (5.63)	43 (60.56)	47 (66.19)
3.34 Prioritise my day's activities	9 (12.68)	45 (63.38)	54 (76.06)
3.35 Select drugs (available in the hospital or clinic) by considering: cost vs risks vs benefits	7 (9.86)	25 (35.21)	32 (45.07)
3.36 Cope with stress in the workplace	8 (11.27)	25 (35.21)	33 (46.48)

HEALTH ADVOCATE COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.39 Take responsibility for the care of a patient	18 (25.35)	48 (67.61)	66 (92.96)
3.40 Provide health education to a patient	16 (22.86)	52 (74.29)	68 (97.15)
3.41 Implement health prevention and promotion in treatment plan	9 (12.68)	50 (70.42)	59 (83.10)
3.42 Discuss relevant preventive health strategies with patients	8 (11.43)	51 (72.86)	59 (84.29)
3.43 Treat each patient as an individual	13 (18.31)	50 (70.42)	63 (88.73)
3.44 Advocate for patients' rights	10 (14.08)	50 (70.42)	60 (84.50)
3.45 Discuss health risks with patients	10 (14.08)	57 (80.28)	67 (94.36)

SCHOLAR COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.48 Continuously evaluate my own performance	15 (21.13)	45 (63.38)	60 (84.51)
3.49 Recognise my own clinical limitations	23 (32.86)	43 (61.43)	66 (94.29)
3.50 Appreciate the importance of lifelong learning	25 (35.21)	42 (59.15)	67 (94.36)
3.51 Reflect on my own learning needs	16 (22.54)	46 (64.79)	62 (87.33)
3.52 Invest time in developing my skills	12 (16.9)	54 (76.06)	66 (92.96)
3.53 Evaluate my learning experiences	12 (16.9)	52 (73.24)	64 (90.14)
3.54 Critically evaluate research as it relates to my clinical practice	12 (16.9)	37 (52.11)	49 (69.01)
3.55 Plan and develop a research project	12 (16.9)	38 (53.52)	50 (70.42)
3.56 Interpret and present research data	11 (15.49)	36 (50.7)	47 (66.19)

PROFESSIONAL COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.59 Maintain attitudes appropriate to the practice of my profession	18 (25.71)	47 (67.14)	65 (92.85)
3.60 Behave in a calm manner in difficult situations	19 (26.76)	44 (61.97)	63 (88.73)
3.61 Record clinical data systematically	14 (19.72)	50 (70.42)	64 (90.14)
3.62 Know how to approach ethical dilemmas	8 (11.43)	45 (64.29)	53 (75.72)
3.63 Cope with my own emotions in distressing clinical situations	8 (11.27)	35 (49.3)	43 (60.57)
3.64 Know my professional role and responsibility in the event of social protest	7 (9.86)	34 (48.9)	41 (58.76)
3.65 Balance my work and personal life	8 (11.27)	23 (32.39)	31 (43.66)
3.66 Understand plagiarism and intellectual property	15 (21.43)	46 (65.71)	61 (87.14)
3.67 Appreciate privacy and autonomy	18 (25.35)	49 (69.01)	67 (94.36)

COMMUNITY-BASED EDUCATION COMPETENCIES

STATEMENT	STRONGLY AGREE	AGREE	TOTAL
3.70 Know how to interact with community leaders	6 (8.45)	35 (49.3)	41 (57.75)
3.71 Understand community perspective on their healthcare needs	6 (8.45)	46 (64.79)	52 (73.24)
3.72 Know how to respond to the healthcare needs of my immediate community	6 (8.45)	44 (61.97)	50 (70.42)
3.73 Know how to communicate with patients from the community in their language	6 (8.45)	23 (32.39)	29 (40.84)
3.74 Learn basic language relevant to my community	3 (4.35)	25 (36.23)	28 (40.63)
3.75 Know how to conduct community-based research	5 (7.14)	32 (45.71)	37 (52.85)

ITEMS AND THE RELIABILITY VALUES AND DESCRIPTIVE ANALYSIS OF SCALES

	ITEMS	ALPHA
Overall internship experience		
I was well oriented to my job by the hospital staff when I arrived)		
I have experience good clinical supervision during my internship		
My seniors have been available when I needed help		
I have copied well psychologically this year		
I have a positive attitude towards public service due to my internship experience	7	0.7361
I know what was expected of me during the internship		
I feel that I was sufficiently prepared for internship during my undergraduate studies		
Medical Expert		
3.1 Apply my knowledge of basic sciences in managing/diagnosing clinical conditions		
3.2 Demonstrate appropriate use of diagnostic procedural skills		
3.3 Carry out a comprehensive physical examination		
3.4 Draw up a comprehensive assessment of a patient	8	0.8238
3.5 Carry out basic procedures in wards (drips, catheters, etc.)		
3.6 Conduct/assist with basic surgical procedures		
3.7 Manage medical emergencies		
3.8 Show appropriate use of diagnostic procedural skills		
Communicator competencies		
3.11 Evaluate and communicate family factors on illness		
3.12 Appreciate the importance of a patient's cultural and ethnic background		
3.13 Show empathy regarding poverty and unemployment on illness of patients	8	0.8051
3.14 Feel competent to counsel a distressed patient		
3.15 Tell a patient that they have a terminal illness		
3.16 Deal with relatives of patients in distressing situations		
3.17 Manage difficult patients		
3.18 Know how to present a mixed-methods case study to peers		
Collaborator competencies		
3.21 Work in interprofessional teams		
3.22 Approach senior staff for assistance when uncertain		
3.23 Work with health and rehabilitation sciences professionals to develop a comprehensive patient manager plan	6	0.7799
3.24 Be empathic towards the needs of nursing staff		
3.25 Understand the importance of group dynamics		
3.26 Successfully communicate with other health professionals		
Leader & manager competencies		
3.29 Understand professional practice laws		
3.30 Serve in leader and/or administrative roles		
3.31 Function successfully in resource-constrained environments		
3.32 Understand the SA healthcare system		
3.33 Manage medico-legal documentation	L	0.8025
3.34 Prioritise my day's activities		
3.35 Select drugs (available in the hospital or clinic) by considering: cost vs risks vs benefits		
3.36 Cope with stress in the workplace		
Health advocate competencies		
3.39 Take responsibility for the care of a patient	7	0.8467
3.40 Provide health education to a patient		
3.41 Implement health prevention and promotion in treatment plan		

3.42 Discuss relevant preventive health strategies with patients		
3.43 Treat each patient as an individual		
3.44 Advocate for patients' rights		
3.45 Discuss health risks with patients		
Scholar competencies		
3.48 Continuously evaluate my own performance	9	0.9044
3.49 Recognise my own clinical limitations		
3.50 Appreciate the importance of lifelong learning		
3.51 Reflect on my own learning needs		
3.52 Invest time in developing my skills		
3.53 Evaluate my learning experiences		
3.54 Critically evaluate research as it relates to my clinical practice		
3.55 Plan and develop a research project		
3.56 Interpret and present research data		
Professional competencies		
3.59 Maintain attitudes appropriate to the practice of my profession	9	0.8180
3.60 Behave in a calm manner in difficult situations		
3.61 Record clinical data systematically		
3.62 Know how to approach ethical dilemmas		
3.63 Cope with my own emotions in distressing clinical situations		
3.64 Know my professional role and responsibility in the event of social protest		
3.65 Balance my work and personal life		
3.66 Understand plagiarism and intellectual property		
3.67 Appreciate privacy and autonomy		
Community-Based Education competencies		
3.70 Know how to interact with community leaders	6	0.7931
3.71 Understand community perspective on their healthcare needs		
3.72 Know how to respond to the healthcare needs of my immediate community		
3.73 Know how to communicate with patients from the community in their language		
3.74 Learn basic language relevant to my community		
3.75 Know how to conduct community-based research		

All the average positive competency scales were above 70% except for leadership and management (64.8%) as well as community engagement (55.6%). The scales with 50% of the participants who scored between 80% and 100% are medical expert, collaboration, advocacy with IQR of 87.5 to-100%, 83.3 to 100% and 85.7 to 100% respectively. Scales with instances were no positive response (minimum value is 0) was provided are overall period, collaboration, leadership and management and scholarly (*cf.* Table 7).

Descriptive statistics for the created positive core competency scales (n=71)

SCORES	MEAN	SD	IQR	MEDIAN	MIN	MAX
Overall period scales	73.0	21.8	57.1 - 85.7	71.4	0.0	100.0
Medical expert scale	90.3	15.0	87.5 - 100.0	100.0	37.5	100.0
Communication scale	74.6	24.9	50.0 -100.0	87.5	12.5	100.0
Collaboration scale	84.0	21.4	83.3 - 100.0	83.3	0.0	100.0
Leadership & management scale	64.8	26.2	50.0 - 87.5	75.0	0.0	100.0
Advocacy scale	88.9	18.3	85.7 - 100.0	100.0	14.3	100.0
Scholarly scale	83.1	21.4	66.7 - 100.0	88.9	0.0	100.0
Professional scale	76.4	21.2	66.7 - 88.9	77.8	11.1	100.0
Community engagement score	55.6	30.1	33.3 --83.3	50.0	0.0	100.0

In general, the correlations of the scales ranged between 0.129 and 0.5717 with the correlation between collaboration and medical expert being 0.5245 and that of professional scale and leadership and management being 0.5717 (*cf.* Table 4.17).

Correlation analysis of the positive composite core competency scales

	OVERALL PERIOD SCALE	MEDICAL EXPERT SCALE	COMMUNICATION SCALE	COLLABORATION SCALE	LEADERSHIP & MANAGEMENT SCALE	ADVOCACY SCALE	SCHOLARLY SCALE	PROFESSIONAL SCALE	COMMUNITY ENGAGEMENT SCALE
Overall period scale	1								
Medical expert scale	0.2516	1							
Communication scale	0.3204	0.4577	1						
Collaboration scale	0.129	0.5245	0.2075	1					
Leadership & management scale	0.4615	0.2958	0.3905	0.2095	1				
Advocacy scale	0.3016	0.3303	0.3558	0.3081	0.2345	1			
Scholarly scale	0.1952	0.3303	0.439	0.3101	0.3454	0.3849	1		
Professional scale	0.2448	0.3621	0.494	0.2764	0.5717	0.4093	0.4279	1	
Community engagement scale	0.1883	0.2155	0.3523	0.3646	0.3379	0.3133	0.4912	0.493	1

To identify possible perceived core competencies that are associated with perceived Medical expert regression analysis was performed and the results are presented in Table 4.13. For a unit increase in positive perception on communication, positive perception of medical expert increases by 0.18818 and this increase is statistically significant ($p=0.009$). Similarly, a unit increase in positive perception on collaboration, increases positive perception of medical expert by 0.31429 and this increase is statistically significant ($p<0.0001$). Positive perception of the other core competencies was not significantly associated with positive perception of medical expert.

Relationship between Medical expert and other core competencies

Medical Expert scale	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]
Communication scale	0.18818	0.06995	2.69	0.009	0.04840; 0.32796
Collaboration scale	0.31429	0.07403	4.25	0.000	0.16636; 0.46223
Leadership scale	0.03007	0.06746	0.45	0.657	-0.10474; 0.16488
Advocacy scale	0.05242	0.09078	0.58	0.566	-0.12900; 0.23382
Scholarly scale	0.03918	0.08378	0.47	0.642	-0.12824; 0.20660
Professional scale	0.05973	0.09523	0.63	0.533	-0.13058; 0.25003
Community engagement scale	-0.08235	0.05976	-1.38	0.173	-0.02018; 0.03707
_Constant	40.0114	8.70009	4.6	0.000	22.62565; 57.39714

APPENDIX H

MEDICAL INTERNS EXPERIENCE DURING THE OVERALL INTERNSHIP PERIOD

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
I was well oriented to my job by the hospital staff when I arrived (n=71)	55 (77.46)	8 (11.27)	8 (11.27)
I have experience good clinical supervision during my internship	59 (83.1)	10 (14.08)	2 (2.82)
My seniors have been available when I needed help	60 (84.41)	8 (11.27)	3 (4.23)
I have coped well psychologically this year	41 (57.75)	13 (18.31)	17 (23.94)
I have a positive attitude towards public service due to my internship experience	31 (43.66)	16 (22.54)	24 (33.8)
I know what was expected of me during the internship	60 (84.51)	3 (4.23)	8 (11.27)
I feel that I was sufficiently prepared for internship during my undergraduate studies	57 (80.28)	10 (14.08)	4 (5.63)

MEDICAL EXPERT COMPETENCES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.1 Apply my knowledge of basic sciences in managing/diagnosing clinical conditions	65 (91.55)	4 (5.63)	2 (2.82)
3.2 Demonstrate appropriate use of diagnostic procedural skills	67 (94.37)	4 (5.63)	0 (0)
3.3 Carry out a comprehensive physical examination	71 (100)	0 (0)	0 (0)
3.4 Draw up a comprehensive assessment of a patient	64 (90.14)	6 (8.45)	1 (1.41)
3.5 Carry out basic procedures in wards (drips, catheters, etc.)	71 (100)	0 (0)	0 (0)
3.6 Conduct/assist with basic surgical procedures	55 (77.46)	11 (15.49)	5 (7.04)
3.7 Manage medical emergencies	58 (81.69)	9 (12.68)	4 (5.63)
3.8 Show appropriate use of diagnostic procedural skills	62 (87.32)	7 (9.86)	2 (2.82)

COMMUNICATOR COMPETENCES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.11 Evaluate and communicate family factors on illness	52 (73.24)	11 (15.49)	8 (11.27)
3.12 Appreciate the importance of a patient's cultural and ethnic background	55 (77.46)	13 (18.31)	3 (4.23)
3.13 Show empathy regarding poverty and unemployment on illness of patients	62 (87.32)	7 (9.86)	2 (2.82)
3.14 Feel competent to counsel a distressed patient	48 (67.61)	14 (19.72)	9 (12.68)
3.15 Tell a patient that they have a terminal illness	52 (73.24)	10 (14.08)	9 (12.68)
3.16 Deal with relatives of patients in distressing situations	41 (57.75)	17 (23.94)	13 (18.31)
3.17 Manage difficult patients	47 (66.2)	13 (18.31)	11 (15.49)
3.18 Know how to present a mixed-methods case study to peers	67 (94.37)	1 (1.41)	3 (4.23)

COLLABORATOR COMPETENCES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.21 Work in interprofessional teams	66 (92.96)	3 (4.23)	2 (2.82)
3.22 Approach senior staff for assistance when uncertain	63 (90)	5 (7.14)	2 (2.86)

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.23 Work with health and rehabilitation sciences professionals to develop a comprehensive patient manager plan	58 (81.69)	7 (9.86)	6 (8.45)
3.24 Be empathic towards the needs of nursing staff	46 (64.79)	15 (21.13)	10 (14.08)
3.25 Understand the importance of group dynamics	61 (87.14)	7 (10)	2 (2.86)
3.26 Successfully communicate with other health professionals	64 (91.43)	5 (7.14)	1 (1.43)

LEADER AND MANAGER COMPETENCIES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.29 Understand professional practice laws	38 (53.52)	24 (33.8)	9 (12.68)
3.30 Serve in leader and/or administrative roles	48 (67.61)	14 (19.72)	9 (12.68)
3.31 Function successfully in resource-constrained environments	59 (83.1)	7 (9.86)	5 (7.04)
3.32 Understand the SA healthcare system	57 (80.28)	11 (15.49)	3 (4.23)
3.33 Manage medico-legal documentation	47 (66.2)	15 (21.13)	9 (12.68)
3.34 Prioritise my day's activities	54 (76.06)	8 (11.27)	9 (12.68)
3.35 Select drugs (available in the hospital or clinic) by considering: cost vs risks vs benefits	32 (45.07)	14 (19.72)	25 (35.21)
3.36 Cope with stress in the workplace	33 (46.48)	21 (29.58)	17 (23.94)

ADVOCATE COMPETENCIES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.39 Take responsibility for the care of a patient	66 (92.96)	2 (2.82)	3 (4.23)
3.40 Provide health education to a patient	68 (97.14)	1 (1.43)	1 (1.43)
3.41 Implement health prevention and promotion in treatment plan	59 (83.1)	11 (15.49)	1 (1.41)
3.42 Discuss relevant preventive health strategies with patients	59 (84.29)	8 (11.43)	3 (4.29)
3.43 Treat each patient as an individual	63 (88.73)	4 (5.63)	4 (5.63)
3.44 Advocate for patients' rights	60 (84.51)	5 (7.04)	6 (8.45)
3.45 Discuss health risks with patients	67 (94.37)	3 (4.23)	1 (1.41)

SCHOLAR COMPETENCIES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.48 Continuously evaluate my own performance	60 (84.51)	7 (9.86)	4 (5.63)
3.49 Recognise my own clinical limitations	66 (94.29)	3 (4.29)	1 (1.43)
3.50 Appreciate the importance of lifelong learning	67 (94.37)	4 (5.63)	0 (0)
3.51 Reflect on my own learning needs	62 (87.32)	7 (9.86)	2 (2.82)
3.52 Invest time in developing my skills	66 (92.96)	3 (4.23)	2 (2.82)
3.53 Evaluate my learning experiences	64 (90.14)	4 (5.63)	3 (4.23)
3.54 Critically evaluate research as it relates to my clinical practice	49 (69.01)	13 (18.31)	9 (12.68)
3.55 Plan and develop a research project	50 (70.42)	14 (19.72)	7 (9.86)
3.56 Interpret and present research data	47 (66.2)	16 (22.54)	8 (11.27)

PROFESSIONAL COMPETENCIES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.59 Maintain attitudes appropriate to the practice of my profession	65 (92.86)	4 (5.71)	1 (1.43)
3.60 Behave in a calm manner in difficult situations	63 (88.73)	7 (9.86)	1 (1.41)
3.61 Record clinical data systematically	64 (90.14)	7 (9.86)	0 (0)
3.62 Know how to approach ethical dilemmas	53 (75.71)	13 (18.57)	4 (5.71)
3.63 Cope with my own emotions in distressing clinical situations	43 (60.56)	13 (18.31)	15 (21.13)
3.64 Know my professional role and responsibility in the event of social protest	41 (57.75)	15 (21.13)	15 (21.13)
3.65 Balance my work and personal life	31 (43.66)	18 (25.35)	22 (30.99)
3.66 Understand plagiarism and intellectual property	61 (87.14)	8 (11.43)	1 (1.43)
3.67 Appreciate privacy and autonomy	67 (94.37)	3 (4.23)	1 (1.41)

COMMUNITY-BASED EDUCATION COMPETENCIES

STATEMENT	AGREE n (%)	NEUTRAL n (%)	DISAGREE n (%)
3.70 Know how to interact with community leaders	41 (57.75)	20 (28.17)	10 (14.08)
3.71 Understand community perspective on their healthcare needs	52 (73.24)	15 (21.13)	4 (5.63)
3.72 Know how to respond to the healthcare needs of my immediate community	50 (70.42)	18 (25.35)	3 (4.23)
3.73 Know how to communicate with patients from the community in their language	29 (40.85)	20 (28.17)	22 (30.99)
3.74 Learn basic language relevant to my community	28 (40.58)	20 (28.99)	21 (30.43)
3.75 Know how to conduct community-based research	37 (52.86)	21 (30.0)	12 (17.14)

OPEN-ENDED QUESTION DATA ON MEDICAL INTERNS SURVEY

Q 3.9) Were your medical expert competencies sufficiently assessed during the undergraduate medical programme?

Yes = 91.5% No = 8.5%

Q 3.10) Please explain your answer for Q3.9. The answers in question 3.9 were captured into themes with description and excerpts as follows:

CATEGORY	KEY THEME	SUBTHEME	DESCRIPTION	EXCERPTS
Sufficient assessment				
	Quality of assessment tools		Quality of assessment tools at UFS is very high; they are fair; they offer individual attention	<ul style="list-style-type: none"> ▪ <i>Compared to other universities, local and international, UFS extensively assesses its own student...</i> ▪ <i>When comparing to those from other programmes, UFS is far ahead in assessing our knowledge and abilities.</i> ▪ <i>Exams were fair.</i> ▪ <i>The fact that we couldn't promote anything other than the paed's practical exam (for logistical purposes) meant that we were constantly assessed. Smaller classes also meant that lecturers knew us better in order to assess our competency.</i>
	Readiness for practice		Assessments provide good preparation for practice	<ul style="list-style-type: none"> ▪ <i>I felt well prepared for internship.</i> ▪ <i>My assessments were appropriately set to prepare me for internship.</i> ▪ <i>Most of what I was assessed during undergraduate training have been used in my internship.</i> ▪ <i>The assessments were adequate [sic] to prepare me for the level required as a GP.</i> ▪ <i>The assessments were sufficient in the way that they assessed mainly what is expected of a good general medical practitioner.</i> ▪ <i>The clinical cases prepare [sic] you well.</i>
	Modes of assessment	Bedside clinical assessment		<ul style="list-style-type: none"> ▪ <i>Assessed in all case and ward round assessments.</i> ▪ <i>Regular clinical cases where patients had to be presented.</i> ▪ <i>We were allowed an opportunity to present our patients in the Ward and create a problem list with a differential diagnosis and discuss your management plan.</i>
		<i>Multiple exams and test</i>		<ul style="list-style-type: none"> ▪ <i>Large amounts of tests in various formats were conducted.</i> ▪ <i>There was always some form of assessment happening every week.</i> ▪ <i>We had many practical and written exams to test this competency multiple exams.</i>
		<i>OSCEs</i>		<ul style="list-style-type: none"> ▪ <i>OSCEs helped us to prepare for clinical skills</i>

				<ul style="list-style-type: none"> ▪ <i>There were many stations in OSCE's from our first clinical year until our final where there were communication stations. Many of the medical expert competencies were assessed there and I implement it now too.</i>
Insufficient assessment				<ul style="list-style-type: none"> ▪ In most of the departments there was no formal assessments. More an impression mark
	Lack of assessment on ethical conduct		No emphasis on ethical conduct	<ul style="list-style-type: none"> ▪ <i>The asked common emergencies and how to manage them and made sure you knew them should they present. However, the ethical side thereof was not really talked about or emphasised.</i>
	Insufficient time		Lack of time for comprehensive assessment	<ul style="list-style-type: none"> ▪ <i>There is little time for the full assessment of knowledge. There is also not always enough space for patient management or plans in the undergraduate programme, which can make one uncertain when truly having to decide on the specific management of the patient in front of you and the practical aspects around it.</i>
	Superficial testing and rote learning		Standard of assessment is too low	<ul style="list-style-type: none"> ▪ <i>I feel the minimum standard is too low. Real world is a lot harder. There is often enough teaching, but the testing is too superficial. It doesn't motivate anybody to build foundation knowledge. It only motivates for superficial knowledge that escapes as soon as you leave the hall.</i>
	Subjective assessment		Lack of benchmark/standard for assessment	<ul style="list-style-type: none"> ▪ <i>Sadly, at UFS marks are made up before you even enter the exam. Based on how well liked you are by the examiners, and if you bought the examiners coffee for ward rounds.</i>
Additional comments				
		<i>Miscellaneous</i>		<ul style="list-style-type: none"> ▪ <i>IMA/MIMA helped me evaluate my patients as a person with multiple systems and not just medicine/ surgery/ ortho or even Cardiology/Respiratory etc.</i> ▪ <i>Important information for every department was highlighted.</i> ▪ <i>Communication with patients and staff daily. Collaborator as part of a medical team including specialists and allied health daily. leader in allied health teams as a central figure, Communicator, Collaborator, Leader, Health Advocate, Scholar, and Advocate, especially in obstetrics and Gynae (contraception). Scholar: I often read up on diseases and expand my knowledge, and Professional in the way I conduct myself.</i>
		<i>Repetitive learning</i>		<ul style="list-style-type: none"> ▪ <i>And repetition is key in having confidence in performing skills adequately.</i>

Q 3.19) Were your communicator competencies sufficiently assessed during the undergraduate medical programme?

Yes = 78.9% No = 21.1%

Q 3.20) Please explain your answer for Q3.19

CATEGORY	KEY AREA OF INTERVIEW	THEME	DESCRIPTION	EXCERPTS
Sufficient assessment				
				<ul style="list-style-type: none"> Adequate for the level required now. communicator skills were assessed on multiple occasions during my studies. communicator was definitely well assessed throughout our studies. I feel that I was well prepared to communicate good with patients. Several modules through the undergraduate programme had sections aimed at improving communicator skills. We were taught and assessed on communicator in multiple modules, especially Family Medicine. We were allowed to speak to our patients and explain final manager plans.
	Areas assessed	Breaking bad news		<ul style="list-style-type: none"> Breaking bad news and addressing patients with poor prognosis as well as patient refusal of treatment. Those were things learned on training. I remember OSCE stations where we had to break bad news or explain a disease to a patient or family member.
		Collegial communicator		<ul style="list-style-type: none"> Communicating with seniors and colleagues in a clinical environment was well taught, well-practised and well assessed. I have been able to confidently discuss pressing matters with family as well as with my peers. There were multiple opportunities to communicate with peers and family.
		Medical procedures		<ul style="list-style-type: none"> Explain procedures well
		Obtaining informed consent		<ul style="list-style-type: none"> Informed consent
		Patient counselling		<ul style="list-style-type: none"> Able to counsel a patient on a diagnosis well Had OSCEs and saw first-hand from seniors how to council Had to communicate to patients in various situations We were asked to present many cases, and even counsel patients.

	Modes of assessment	Oral examinations		<ul style="list-style-type: none"> ▪ <i>Countless oral examinations.</i> ▪ <i>Oral exams with OSCE stations.</i> ▪ <i>This was assessed during oral exams and in the wards.</i> ▪ <i>We did many case presentations during assessment in medical school.</i> ▪ <i>We had to present our finding in the cases section of each exam; this forced us to summarise and communicate your findings.</i>
		OSCEs		<ul style="list-style-type: none"> ▪ <i>OSCE was set in all relevant fields.</i> ▪ <i>OSCEs especially in Family Medicine assessed these skills.</i> ▪ <i>OSCEs helped me to communicate with a variety of people.</i> ▪ <i>OSCE and counselling stations.</i>
		Ward rounds and academic presentations		<ul style="list-style-type: none"> ▪ <i>Multiple Ward Rounds and academic presentations.</i>
Insufficient assessment				
	No formal assessment		It is part of formative assessment but no formal assessment mark allocation	<ul style="list-style-type: none"> ▪ <i>They were basically never assessed.</i> ▪ <i>Undervalued in exams, bedside manner and patient communicator was never examined.</i> ▪ <i>There was lot of opportunity to acquire the skill, although it was never objectively evaluated.</i> ▪ <i>It contributed small portion in our assessments if any.</i> ▪ <i>Cases do not really assess this.</i>
	Lack of face-to-face assessment		Physical interaction with real patients was neglected	<ul style="list-style-type: none"> ▪ <i>Did not have a lot of real patients and patient's families to communicate BAD NEWS to.</i> ▪ <i>On the other hand, I feel communicator with patients and families, especially the delivery of 'bad news', wasn't focused on enough.</i>
	communicator not formally taught		No formal learning area for communicator	<ul style="list-style-type: none"> ▪ <i>UFS did not emphasise communicator during our training.</i> ▪ <i>The focus was only on medical knowledge.</i>
	Lack of counselling lessons		There is a lack of grief counselling lessons	<ul style="list-style-type: none"> ▪ <i>More time could be spent in developing basic counselling skills, as the delivery of bad news is one of the most taxing parts of our job, and at my facility it was almost solely the jo of the intern to deliver any and all bad news, and I definitely stumbled quite badly through quite a few of these conversations.</i> ▪ <i>We could've done more situations to make me feel more comfortable breaking bad news or giving a patient a difficult diagnosis and outcome.</i>

Additional comments				
		<i>Challenges</i>	Language barrier	<ul style="list-style-type: none"> ▪ <i>Language barriers remain a problem when trying to build an adequate rapport with patients.</i>

Q 3.27) Were your collaborator competencies sufficiently assessed during the undergraduate medical programme? Yes = 72.5% No = 27.5%

Q 3.28) Please explain your answer for Q3.27

CATEGORY	KEY AREA OF INTERVIEW	THEME	DESCRIPTION	EXCERPTS
Sufficient assessment				
	Platforms of assessment	<i>Community-based education/IPE in Botshabelo/Trompsburg</i>		<ul style="list-style-type: none"> ▪ <i>Botshabelo/Trompsburg training and working in interprofessional teams helped assess and train us in team dynamics with the patient as the centre of his/her care.</i> ▪ <i>.... the IPE put that to the test.</i> ▪ <i>We dealt with this area on our two weeks visit to Trompsburg.</i> ▪ <i>We had an interdisciplinary outreach to Trompsburg.</i> ▪ <i>We were assessed by going as an interprofessional team to the community and looking at patients from a holistic view.</i> ▪ <i>Yes, the community-based education programme we had in Family Medicine with Allied Health helped a lot with learning how to collaborate minimal interprofessional work.</i>
		<i>Interdisciplinary group projects</i>		<ul style="list-style-type: none"> ▪ <i>Group projects forced collaborator.</i> ▪ <i>Interdisciplinary communicator and their functions were taught and emphasised.</i> ▪ <i>Multiple Multidisciplinary Team interactions.</i> ▪ <i>We had lectures and interdisciplinary subject I think in third year that really helped to understand each discipline and the role they play in the manager of a patient.</i> ▪ <i>Worked in a multidisciplinary team in some modules.</i>
		<i>OSCEs</i>		<ul style="list-style-type: none"> ▪ <i>There was a station in one of the OSCEs where we had to discuss what allied health member we would involve and why.</i>
		<i>Simulations</i>		<ul style="list-style-type: none"> ▪ <i>Had numerous simulation experiences and worked with multidisciplinary teams in the hospital.</i>

Insufficient assessment				
	No formal assessment		It is part of formative assessment but no formal assessment mark allocation	<ul style="list-style-type: none"> ▪ <i>They do not assess this.</i> ▪ <i>Was not really assessed. Just learned during clinical rotations.</i> ▪ <i>There are limited examinations on the actual interaction between students and hospital staff.</i> ▪ <i>It was taught but not assessed.</i> ▪ <i>Never assessed.</i>
	No effective collaborator		Offered collaboration is not effective; it is a waste of time	<ul style="list-style-type: none"> ▪ <i>I don't think we collaborate much in our undergraduate studies.</i> ▪ <i>No emphasis was placed on collaborating with other disciplines. We had very little exposure on when to refer to which discipline during university.</i> ▪ <i>The IPE week did not effectively allow us to improve collaborator.</i> ▪ <i>The pathetic "integrated" modules did little more than waste our time.</i> ▪ <i>There were not enough opportunities in the wards to interact in multidisciplinary teams.</i>
Additional comments				
		<i>Challenge</i>		<ul style="list-style-type: none"> ▪ <i>The job of interns often overlaps with that of nursing staff. Often interns end up doing all procedures for patients (drips etc) nurses often refuse.</i>

Q3.37) Were your leader and manager competencies sufficiently assessed during the undergraduate medical programme?

n=69; Yes = 63.8%; No = 36.2%

Q3.38) Please explain your answer for Q3.37

CATEGORY	KEY THEME	SUBTHEME	DESCRIPTION	EXCERPTS
Insufficient assessment				
	No formal assessment		Deficient curriculum	<ul style="list-style-type: none"> ▪ <i>I don't think there was specific focus to develop our manager and leader skills...</i> ▪ <i>Leader was not assessed in my programme.</i> ▪ <i>I feel like there were not many assessments of these qualities.</i> ▪ <i>This was never addressed.</i> ▪ <i>Was not assessed.</i>
	Lack of platforms for assessment		No platforms or opportunities for assessment	<ul style="list-style-type: none"> ▪ <i>There was never a time as a student where we were afforded the opportunity to lead.</i> ▪ <i>There was not a great platform for practising these skills as a student.</i>

				<ul style="list-style-type: none"> ▪ <i>There weren't enough opportunities.</i>
	Limited skills assessed		Assessment was not comprehensive	<ul style="list-style-type: none"> ▪ <i>Cost consciousness needs to be highlighted.</i> ▪ <i>In certain aspects our way of managing medico-legal documentation and cost manager was not sufficiently assessed.</i> ▪ <i>Leader yes, manager no.</i> ▪ <i>There was an MDOC subject and a Practise subject in final year but they mostly focused on the private sector and the philosophy of the health care system as opposed to the harsh realities of administration and finding practical solutions in the public health sector.</i>
	Opportunities for the select few		Selection of leaders was bias	<ul style="list-style-type: none"> ▪ <i>Only if you were group leader.</i> ▪ <i>Often the same people fall into leader roles, while others get pushed to the side.</i>
Sufficient assessment				
	Modes of assessment	<i>Group projects</i>		<ul style="list-style-type: none"> ▪ <i>Leader and manager were important during difficult group projects.</i> ▪ <i>Opportunities were granted to work as leader of groups.</i> ▪ <i>Teamwork and group sessions.</i>
		<i>OSCEs</i>		<ul style="list-style-type: none"> ▪ <i>During our OSCE we were forced into leader roles and take charge of situations.</i> ▪ <i>These were tested in OSCEs where one did emergency/resus scenarios.</i>
		<i>Practical leader skills</i>		<ul style="list-style-type: none"> ▪ <i>Given opportunity to serve in leader positions.</i> ▪ <i>Placed in several leader positions throughout training.</i> ▪ <i>We have to lead and manage a lot during the studies.</i>
	Skills informally assessed	<i>Medical leader and manager</i>		<ul style="list-style-type: none"> ▪ <i>Placed in several leader positions throughout training.</i> ▪ <i>We got a lot of exposure of leader and manager.</i>
		<i>Patient manager</i>		<ul style="list-style-type: none"> ▪ <i>yes. always part of manager of patient</i>
		<i>Time manager</i>		<ul style="list-style-type: none"> ▪ <i>Had multiple sessions dedicated to manager of time etc. as a student</i>
Additional comments				
		<i>Workplace learning</i>		<ul style="list-style-type: none"> ▪ <i>There are certain aspects that you learn through experience- these are one of them.</i> ▪ <i>This is something I learned more when I started working.</i>

Q3.46) Were your health advocate competencies sufficiently assessed during the undergraduate medical programme?

n = 69; Yes = 78.3%; No = 21.7%

Q3.47) Please explain your answer for Q3.46

CATEGORY	SUBTHEME		DESCRIPTION	EXCERPTS
Insufficient assessment				
	No formal assessment		Deficient curriculum	<ul style="list-style-type: none"> ▪ <i>Never any modules or courses dealing with health advocate.</i> ▪ <i>No did not have many patient interactions.</i> ▪ <i>Not assessed.</i> ▪ <i>Not formally assessed.</i> ▪ <i>However, minimally during clinical rotations.</i> <p><i>Was not assessed.</i></p>
Sufficient assessment				
	Key academic departments for assessments	<i>Family medicine</i>		<ul style="list-style-type: none"> ▪ <i>Fam med (HPT) also had some questions about promoting healthy lifestyles.</i> ▪ <i>This was emphasised in Family Medicine.</i> ▪ <i>We were taught to treat a patient holistically and fam med assessed us for that.</i>
		<i>Obs and Gynae.</i>		<ul style="list-style-type: none"> ▪ <i>OBS and Gynae did a good job of this.</i>
	Modes of assessment	<i>OSCEs</i>		<ul style="list-style-type: none"> ▪ <i>Assessed during OSCEs</i> ▪ <i>There were always health promotion and medical options OSCE questions (especially on contraception).</i>
		<i>Others</i>		<ul style="list-style-type: none"> ▪ <i>Part of other assessments</i>
Additional comments				
		<i>Teaching and learning experiences</i>		<ul style="list-style-type: none"> ▪ <i>During our health and promotion classes were taught of the importance of been a health advocate.</i> ▪ <i>Well explained in lectures.</i> ▪ <i>As knowledge increases your ability to advocate follows.</i>

		<i>Personal experiences</i>		<ul style="list-style-type: none"> ▪ <i>Yes, we often fight for our patients and their best interests and we don't accept resource restraints as a reason to deprive a patient of adequate care.</i> ▪ <i>We were actually listened to when advocating for our patients as students. That made us all very excited and motivated to continue doing so.</i> ▪ <i>There were times I advocated for better work-up of medical conditions for patients.</i>
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Q3.57) Were your scholar competencies sufficiently assessed during the undergraduate medical programme? n=71; Yes = 90.1%; No = 9.9%

Q3.58) Please explain your answer for Q3.57

CATEGORY	KEY THEME	SUBTHEME	DESCRIPTION	EXCERPTS
Insufficient assessment				
	Limited teaching and training		Teaching and learning was not comprehensive	<ul style="list-style-type: none"> ▪ <i>We haven't been trained sufficiently to criticise research. It wasn't incorporated into our learning.</i> ▪ <i>We weren't taught to critically evaluate medical articles. Something I believe UOFS could improve on.</i> ▪ <i>...with minimal practice.</i>
Sufficient assessment				
	Modes of assessment	<i>Research module</i>		<ul style="list-style-type: none"> ▪ <i>GSSM focused well on these competencies.</i> ▪ <i>The MSSM module helped us run, present and publish our own research.</i> ▪ <i>There was enough space for this in our MSSM module, it could however be implemented throughout the programme in modules.</i> ▪ <i>The research module allowed us to improve research skills.</i> ▪ <i>We had a research module that covered each part of research and presentations and protocols which proved to help a lot in terms of protocols.</i>

		<i>Research projects</i>		<ul style="list-style-type: none"> ▪ <i>Did a 2-year research project in 2nd and 3rd year.</i> ▪ <i>The Protocol and Research project done in 3rd and 4th year was a wonderful experience.</i> ▪ <i>For our research module, we had to develop our own research topic as well as present in front of a panel. This helped me appreciate the importance of ongoing learning in our field.</i> ▪ <i>Group Research project done.</i> ▪ <i>We had to do our own research project during our studies- to teach us the principles of research.</i>
Additional comments				
		<i>Teaching and Training Experiences</i>		<ul style="list-style-type: none"> ▪ <i>Academically we were trained well!</i> ▪ <i>Although an extremely tiresome task, our research studies taught us a lot of important lessons.</i> ▪ <i>UFS excelled at teaching scholar competencies..</i>

Q3.68) Were your professional competencies sufficiently assessed during the undergraduate medical programme?

n=70; Yes = 84.3%; No = 15.7%

Q3.69) Please explain your answer for Q3.68

CATEGORY	KEY AREA OF INTERVIEW	THEME	DESCRIPTION	EXCERPTS
Insufficient assessment				
		Difficulty in assessment	Soft skills are difficult to assess	<ul style="list-style-type: none"> ▪ <i>I feel like this is more a character thing than something to be taught.</i> ▪ <i>This is something that is difficult to assess.</i> ▪ <i>You cannot assess this until challenged in life.</i>
		Limited attention	Insufficient time spend on the competency	<ul style="list-style-type: none"> ▪ <i>More time could have been spent on these topics.</i> ▪ <i>Support in this regard was advertised but not followed through.</i>
		No formal assessment	It is part of formative assessment but no formal assessment mark allocation	<ul style="list-style-type: none"> ▪ <i>In Fam Med especially clinically not necessarily assessing it.</i> ▪ <i>It was taught on multiple occasions but never formally assessed.</i> ▪ <i>Was not assessed.</i>

Sufficient assessment			<i>Assessed continuously by senior staff.</i>
	Modes of assessment	<i>Modules</i>	<ul style="list-style-type: none"> ▪ <i>High sense of patient confidentiality instilled during ethics modules.</i> ▪ <i>We had modules that tested our professional competencies and challenged our ethical perspectives.</i>
		<i>OSCEs</i>	<ul style="list-style-type: none"> ▪ <i>Not just on score sheets, but subjectively in every OSCE one had to be professional to pass.</i>
		<i>Simulation</i>	<ul style="list-style-type: none"> ▪ <i>Also practising medical emergencies in the clinical simulation unit did a good job of preparing us.</i>
		<i>Regular assessment</i>	<ul style="list-style-type: none"> ▪ <i>Constantly been assessed during training</i> ▪ <i>This was practised daily in the clinical years.</i>
		<i>The UFS MBChB curriculum</i>	<ul style="list-style-type: none"> ▪ <i>From the beginning we are assessed on professional behaviour.</i> ▪ <i>The entire MBChB course tests your professional competency.</i>

Q3.76) Were your community-based education competencies sufficiently assessed during the undergraduate medical programme?

n=70; Yes = 71.4%; No = 28.6%

Q3.77) Please explain your answer for Q3.76

CATEGORY	KEY AREA OF INTERVIEW	THEME	DESCRIPTION	EXCERPTS
Insufficient assessment				
		No formal assessment	It is part of formative assessment but no formal assessment mark allocation	<ul style="list-style-type: none"> ▪ <i>Focused on in first year but only really learned it during practical work and never really assessed again.</i> ▪ <i>I think more emphasis is needed on this aspect.</i>
Sufficient assessment				
	Modes of assessment	<i>Community-based education</i>		<ul style="list-style-type: none"> ▪ <i>Community projects done.</i> ▪ <i>During community-based education, we engaged a lot with community members at local clinics.</i> ▪ <i>Rural outreaches done.</i> ▪ <i>We did quite a bit of this in the two weeks in Trompsburg.</i>

				<ul style="list-style-type: none"> ▪ We had plenty of assessment in Fam med. as well as in the community project and IPE. ▪ Went to two different rural communities for two weeks each. ▪ With our community programme we were taught the importance of the role of a community in health.
		<i>Department of Family Medicine</i>		<ul style="list-style-type: none"> ▪ Family medicine covered that during our rotation. ▪ Family medicine placed us within the community, and we were assessed on our reflective pieces. ▪ We had plenty of assessment in Fam med. as well as in the community project and IPE.
		<i>Modules</i>		<ul style="list-style-type: none"> ▪ Various courses tested these competencies.
Additional comments				
		<i>Challenges</i>	<i>Language and culture barrier</i>	<ul style="list-style-type: none"> ▪ I had to relearn the new culture and basic language as we were only taught about the community around FS. ▪ Utilise translators if possible, I.e. family or nursing staff etc. ▪ I as a white student just actually wish learning African language was compulsory because I wish every day that I could speak my patient's language. ▪ I believe we would have benefited immensely from forma seSotho classes and education. ▪ It is difficult to train the above as each province has different needs and cultures and languages. ▪ More emphasis needs to be placed on language development. ▪ I do think there needs to be a lot more emphasis on the language barrier. It's such a struggle and the fault lie entirely with us. ▪ The language spoken within the community was not adequately taught. ▪ More sesotho needed. ▪ We did not have adequate exposure to learn different languages.

Q4.1) Do you feel the training and assessment on the AfriMEDS mentioned in Section 3 Sufficiency of the undergraduate training was sufficient during the undergraduate programme? n=71; Yes = 91.5%; No = 8.5%

Q4.2) Please explain your answer for Q4.1

CATEGORY	KEY AREA OF INTERVIEW	THEME	DESCRIPTION	EXCERPTS
Insufficient assessment				
		Inadequate teaching	Some learning areas were inadequately taught	<ul style="list-style-type: none"> ▪ <i>There are certain aspects that were not completely taught during the undergraduate training.....</i> ▪ <i>It would have been nice to have had a better approach and practice regarding resus situations - E.g. ACLS/ATLS/PALS as a student.</i>
		Low-level learning outcomes	Standard of assessment is too low	<ul style="list-style-type: none"> ▪ <i>I feel the minimum standard is too low. I see many doctors that can't diagnose or treat basic medical conditions, or even write basic referral notes.</i>
		Need for improvement	Lack of formal assessment but there's space for improvement	<ul style="list-style-type: none"> ▪ <i>All of them may not have been formally assessed, but still I feel that there was enough opportunity to develop them.</i> ▪ <i>I think there is always room for improvement...</i>
Sufficient assessment				
		Adequate teaching and training	The programme offered adequate teaching and training	<ul style="list-style-type: none"> ▪ <i>Every one of those topics were addressed throughout our studies. The subjects that particularly focused on it were mCLI, mHEL, mDOC, OBS and Gynae and FamMed. There may be more but those stood out.</i> ▪ <i>I believe I had great training at UFS. I can clearly see the difference between UFS interns and other.</i> ▪ <i>I believe the Free State has a good Med School.</i> ▪ <i>I feel I was well trained.</i> ▪ <i>I feel more confident than most of my peers from other varsities to work as a doctor in my hospital.</i> ▪ <i>It was sufficient...</i> ▪ <i>Prepared well in undergrad studies.</i> ▪ <i>The programme is well designed to build these competencies.</i> ▪ <i>We were well prepared and assessed.</i> ▪ <i>Yes. Some things you need to learn and will only learn properly when you are on the job. It is more important to get the foundational medical knowledge</i>

				<i>right during medical school.</i>
		Competent medical graduate	Graduates felt adequately skilled and prepared for internship	<ul style="list-style-type: none"> ▪ <i>Did not feel inadequate upon initiating internship.</i> ▪ <i>Had no difficulty in transitioning from being a student to a doctor. We got used to how the system works and had a lot of patient interactions.</i> ▪ <i>I am proud to be a graduate of the University of the Free State, I am proud of the doctor they taught me to be, and I do think a Kopsie doctor is recognisable by their work ethic, positive attitude and skill.</i> ▪ <i>I feel much more confident in the workplace with the training that I have received.</i> ▪ <i>I felt well equipped with the training I received and was well assessed to assure that.</i> ▪ <i>I had the necessary skills and knowledge to do internship.</i> ▪ <i>I was adequately prepared for internship.</i> ▪ <i>My studies at UFS prepared me to be a confident Doctor that can appropriately advice, diagnose and manage my patients in a team setting, and to ask for assistance from Senior Doctors should I need it.</i> ▪ <i>UFS produces better intern doctors than Stellenbosch, UCT, Tuks etc.</i> ▪ <i>We are able to handle more situations, better than most of our colleagues during internship as we have knowledge and skills that allow us to manage emergencies and common conditions well.</i> ▪ <i>UFS tries their best and we really do shine amongst graduates from other universities.</i> ▪ <i>Yes definitely enough to make you a competent successful health professional.</i>
		Consistent assessment	Continuous assessment	<ul style="list-style-type: none"> ▪ <i>Consistent and repetitive evaluations at regular intervals.</i> ▪ <i>We were examined on absolutely everything. At least four times.</i>
		Key subjects and Modules	Major modules with formal assessment	<ul style="list-style-type: none"> ▪ <i>The subjects that particularly focused on it were MCLI, mHEL, MDOC, OBS and Gynae and FamMed.</i> ▪ <i>Family medicine gave us the exposure and ability to learn and reflect for the future.</i>

UFS 2020 RULES UNDERGRADUATE MEDICAL PROGRAMME
(Only relevant excerpts are attached)

Rule M3.12 MODULE / SEMESTER MARK

In addition to the stipulations of UFS General Rule A9.2 (Module Mark), all the rules apply as set forth in the Phase I, Phase II and Phase III module or phase guides of the MBChB programme.

Rule M3.13 EXEMPTION FROM MODULES THAT HAVE ALREADY BEEN PASSED

THIS RULE MUST BE READ IN CONJUNCTION WITH RULE M4.5 UNDER ASSESSMENT RULES

A fourth-year student who is repeating semesters 7 and 8 and has already passed a module(s) in the preceding year, has obtained a module mark of at least 60% in the relevant module(s) in the current year, and has attended more than 80% of the contact sessions and clinical residencies in the current semester/year, may apply for exemption from assessment in the relevant module(s) at the main examination opportunity at the end of the year that they are repeating.

Elucidation:

Application for exemption from assessment is made on the prescribed application form available at the office of the Deputy Director: Faculty Administration. Applications must be submitted to the Programme Director: Undergraduate Programme Management and then the Head of the School of Clinical Medicine via the head of department before commencement of the main examination opportunity.

GENERAL ASSESSMENT RULES

ASSESSMENT RULES REGARDING THE MBChB PROGRAMME BC834100

Rule M4 RULES REGARDING ASSESSMENT

The assessment rules¹ of the university, revised where necessary, are applicable to the School of Clinical Medicine.

Rule M4.1 ADMISSION TO ASSESSMENT OPPORTUNITY

- (a) Attendance of all the contact sessions in all the modules in the Schools of Biomedical Sciences, Pathology and Clinical Medicine is compulsory.
- (b) Students who have attended less than 80% of the contact sessions or clinical residency of a module will not be permitted to take part in the main examination opportunity at the end of the semester / year for the relevant module and/or discipline and will not be considered for additional assessment opportunities.

¹Assessment Rules must be read in conjunction with Phase guides.

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- (c) Students with less than 80% attendance, due to exceptional circumstances, will not be permitted to continue with the module without the written approval of the Head of the School of Clinical Medicine.
- (d) To gain admission to the main examination in Phase III, a minimum mark of 45% is required in each discipline contained within the relevant modules. This applies to all disciplines and modules.

Elucidation:

Excluding Phase I [Refer Rule M4.2 (A)] and Phase II [Refer Rule 4.2. (B) and (C)].

Students who wish to appeal against non-admission to an examination opportunity, must submit a written appeal within 48 hours after the module marks are made known to the Head of the School of Clinical Medicine and the Programme Director: Undergraduate Programme Management.

Rule M4.2 COMPOSITION OF MODULE MARKS

A. PHASE I- SEMESTER 1

The modules in semester 1 are MGEN 1513 , MPSY 1513, MDOC 1513, MCHD 1513, MHIS 1513 and MANA 1513 and an Integrated Medical Science Assessment module (MIMA1513).

For the 6 module-specific modules (MGEN 1513, MPSY 1513, MOOG 1513, MCHD 1513, MHIS 1513 and ~~MANA~~ 1513) at least 2 assessments will be offered per module (see phase guide and module work books for more detail.) The module marks of these modules will determine whether the student will be admitted to the main examination opportunity. The module marks of these modules will then also be the final module marks reflected on the University's database.

For the MIMA 1513 module in semester 1 the following modules will be assessed together:

- MPSY 1513, MOOG 1513, MCHD 1513 and MGEN 1513
- MHIS 1513, MANA 1513 and MGEN 1513

For the two groups of modules assessed together in MIMA1513 there are at least two assessment opportunities in each group during semester 1, the marks of which contribute to the module mark for MIMA1513, constituting 50% of the final mark of MIMA1513.

At the end of semester 1, a main examination opportunity is offered, comprising an integrated medical science assessment (MIMA1513). The format of the assessment is similar to the assessments of MIMA1513 during the semester and comprises two question papers that both must be passed independently.

If a student does not gain admission to the main examination opportunity, he/she will be admitted to the Learning Development Programme, provided he/she complies with the admission requirements in rule M6.1. This excludes all senior students who have already obtained a qualification, or students who have already completed a bridging

programme or who have been registered in an extended degree programme. Senior students who have already completed a bridging programme or who have been registered in an extended degree programme must apply to repeat semester 1 again, and may apply immediately for reselection/readmission to semester 1 in the following year and apply with the process and procedures of readmission.

The admission requirements for the main examination opportunity MIMA1513 (semester 1) are as follows:

At least five of the six module-specific modules {MGEN1513, MPSY1513, MDOC1513, MCHD1513, MHIS1513 and MANA1513} must be passed with a mark of at least 50%, and a module mark of at least 45% must be obtained for the remaining module.

A student who fails the main examination, i.e. the integrated medical science assessment (MIMA1513), may qualify for an additional examination opportunity in terms of the related rules (Rule M4.4.2.). Students must write both question papers during the additional examination opportunity. If a student fails the additional examination opportunity as well, the student is admitted to the Learning Development Programme in the second semester, provided he/she complies with the admission requirements in Rule M6.1..

If a student passes the main examination opportunity in MIMA1513 (i.e. both papers of MIMA1513), he/she is admitted to semester 2 {Rule M3.8.1}. A student must obtain 50% or more in each paper in the MIMA 1513 assessment, and a final combined mark of 50% or more.

B. PHASE 11- SEMESTERS 2 AND 3

The modules in semesters 2 and 3 are MMEM 1620/2618, MMOL 1620/2618, MDIS 2614, MINF 2614, MSSM 1620/2613 and MANA 1620/2618.

During the semesters, two integrated medical science assessments are offered, the marks of which contribute to the semester mark for MIMA2613, constituting 50% of the final mark in the written component of MIMA2613.

At the end of semester 3 an integrated medical science assessment (MIMA2613) is offered, comprising a written and OSPE {Objective Structured Practical Examination} component. Both components must be passed independently.

To obtain admission to the main examination opportunity of MIMA2613, a student must pass at least five of the six modules and obtain a minimum of 45% in the failed module. If a student does not gain admission to the main examination opportunity of MIMA2613, the student must repeat semester 2 and 3. If the student fails the main examination opportunity of MIMA2613, the student may qualify for an additional examination opportunity in terms of the related rules. Both the written and OSPE components will be assessed.

If a student is repeating semester 2 and 3 and has already passed MSSM 2613, the student continues with the MSSM project and does not repeat MSSM1620 and

MSSM2613. If a student passes the final assessment in MIMA2613, he/she is admitted to semester 4.

C. PHASE II - SEMESTERS 4 AND 5

The modules in semester 4 and 5 are MURI 2724, MHAЕ 2724, MCAR 2724, MGEN 2724, MGAS 2724, MRES 3714, MHEA 3714, MNER 3714, MEND3714, METH 3714, MSSM 2720/3712 and MCLI 2720/3713. MSSM 2720 is a continuation module and includes a research project for which a final assessment mark is awarded at the end of semester 5.

During the semesters, two integrated medical science assessments are offered, the marks of which contribute to the semester mark for MIMA3713, constituting 50% of the final mark of the written component of MIMA3713.

At the end of semester 5, an integrated medical science assessment (MIMA3713) is offered. The main examination opportunity (MIMA3713) at the end of semester 5 comprises one written integrated medical science assessment as well as an OSCE (Objective Structured Clinical Examination) component, which includes an oral assessment. Both components must be passed independently.

To gain admission to the main examination opportunity of MIMA3713, a student must pass at least 11 of the 12 modules and obtain a minimum of 45% in the failed module. If a student does not gain admission to the main examination opportunity of MIMA3713, the student must repeat semester 4 and 5. If the student fails the main examination opportunity of MIMA3713, the student may qualify for an additional examination opportunity in terms of the related rules. Both the written and OSCE component will be assessed.

If the student is repeating semester 4 and 5 and has already passed MSSM 3712, the student has successfully completed MSSM3712.

If a student passes the main examination opportunity in MIMA3713 (in accordance with the conditions of Rule M3.8.3), he/she is admitted to semester 6.

D. PHASE 111- SEMESTER 6

The modules in semester 6 are MHEL 3823, and MINT 3820, MSUR 3820, MPAE 3823, MOBG 3823 and MPSY 3820 that are continued in semester 7 and 8.

Marks obtained for assessments during semester 6 are carried forward to semester 7 and 8. Assessment includes both written and clinical assessment where applicable, and marks obtained contribute a maximum of 50% to the module mark at the end of semesters 7 and 8. Semester 6 will include a written component in Anaesthesiology from semester 5 and both the written and clinical components of semester 6.

There is no semester main examination opportunity in modules MINT 3820, MSUR 3820, MPAE 3823, MOBG 3823 and MPSY 3820 in semester 6, as the modules are continued in semester 7 and 8 and assessed in those semesters.

If a student fails MHEL 3823 during semester 6 the student must, in the following year's first semester, successfully complete an approved project in Community Health, after which the student will be allowed to again present semester 6 in its totality.

The student will **not** be allowed to register for any other module additional to the relevant project in Community Health. No exemption from modules that are repeated in semester 6 will be granted.

E. PHASE III-SEMESTERS 7 AND 8

At the end of semester 8, a main examination opportunity per module in Semesters 7 and 8 is offered. If a student fails the main examination opportunity, at the end of semester 8 he/she may qualify for admission to the additional examination assessment opportunity in terms of the related rules.

In semesters 7 and 8, students will do four (4) weeks of Community-based education (CBE) at training platforms in the community, as well as Inter-professional education (IPE) at the UFS and training platforms in the community as part of the CBE rotation. Attendance of these CBE rotations and IPE sessions is compulsory. Relevant rules and arrangements for the CBE rotations and IPE sessions are described in the Phase III guide and CBE guides respectively.

If a student is repeating Semesters 7 and 8, the marks obtained in Semester 6 will be transferred to the marks obtained in the repeat year.

F. PHASE III - SEMESTERS 9 AND 10

The main examination opportunities in all the relevant modules of both semesters 9 and 10 will be at the end of semester 10 and will comprise a written and clinical component in most of the modules. This is considered a professional qualifying examination and external examiners are involved in the assessment. These assessments deal with all clinical disciplines through which the students have rotated in the course of the preceding semesters, namely Internal Medicine, General Surgery, Psychiatry, Paediatrics and Child Health, Obstetrics and Gynaecology and Family Medicine as well as, Orthopaedic Surgery, Urology and Anaesthesiology.

An additional written and clinical examination opportunity for modules in semester 9 and/or 10 exists in semester 10, which will take place during the week immediately following the main examination opportunity in semester 10. Students will be allowed to sit for this opportunity according to the rules set under Rule M3.9.2.

A final clinical integrated assessment is offered in Family Medicine (MFAM5818/5828) at the end of semester 10. This involves clinical cases and an OSCE during which the student is assessed regarding general clinical evaluation and treatment of a patient, as well as professional and communication skills, attitude and conduct. If a student fails the assessment in module MFAM, while all other modules are passed, only MFAM must be repeated for three months in the following year.

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- (b) A student has obtained a final combined mark of 50% or more during the main examination opportunity, but not the subminimum of 40% in the components of the specific assessment.
 - (c) A student has submitted a valid medical certificate, certifying that the student had been unable to participate in the main examination opportunity (special form to be completed by a medical practitioner).

Elucidation:

This medical certificate must be handed in to the Head of the School of Clinical Medicine, Room D204, within 48 hours after the absence.

- (d) Rule A 53.4.1.c (i) and (ii) in the General Rules for obtaining the qualification applies, provided that the student:
 - (i) Had admission to the main examination opportunity (i.e. had a module mark of at least 40%).
 - (ii) Had obtained at least 30% in the outstanding module during the assessment opportunity
- (e) All modules registered for in the phase/semester must be passed in order to progress to the next phase/ semester

Rule M5.8 PASS WITH DISTINCTION

See General Rules of the UFS .

**LEARNING DEVELOPMENT PROGRAMME IN THE
FACULTY OF HEALTH SCIENCES
(LDP)**

108 credits

Academic Plan Code: BC81Z000

Rule M6 RULES FOR THE LEARNING DEVELOPMENT PROGRAMME

Rule M6.1 ADMISSION REQUIREMENTS

Students who fail their first semester in the MBChB programme may enter the Learning Development Programme (LDP), provided they qualify.

Elucidation

The following students will not be allowed into the Learning Development Programme:

- (a) A student who has already undergone the university's career development programme or who has participated in an extended degree or bridging programme prior to selection.
- (b) Senior students, in other words a student who has already obtained a qualification before being selected for the MBChB or Allied Health Professions programme.
- (c) A student who has failed more than 50% of the semester 1 modules.

Students in (a) or (c) may apply again in writing at the end of the year for possible reselection for the following year.

Rule M6.2 DURATION OF PROGRAMME

The duration of the Learning Development Programme is six (6) months and is presented in the second semester.

Rule M6.3 THE PROGRAMME

The Learning Development Programme runs through the entire second semester (6 months) and all the modules as well as class attendance are compulsory.

REPRESENTATION OF THE STRUCTURE OF THE PROGRAMME

Biophysics	MPDI1524	16C
Integrated Anatomy and Physiology	BMMT1524	16C
	BMMP1523	12C
Lifelong Learning Skills	LLLS1524	16C
Basic Human Anatomy and Physiology	BMBL1524	16C
Language Skills	EALM1524	16C
Medical Terminology	MMTL1524	16C

C = Credits

Rule M6.4 CLASS ATTENDANCE

Attendance of all the contact periods in the Learning Development Programme is compulsory. Students who have attended less than 80% of the contact periods of a module will not be allowed to participate in the examinations, and it will be regarded that they have failed the module and will not be considered for reassessment. In exceptional cases the Head of the School of Clinical Medicine may grant permission for absence to a maximum of 20%, on condition that students make arrangements for absence with the Head of the School and the Programme Director: Undergraduate Programme Management beforehand.

Rule M6.5 MODULE MARK

In addition to the terms in UFS General Rule A9.2, the rules of the School of Clinical Medicine and the School of Allied Health Professions are applicable.

- (a) **A module mark of 40% or more is required for examination admission in each module in the Learning Development Programme.**
- (b) Marks obtained for written, oral and/or practical work taken during a module may contribute to the module mark. {Details of the composition of the module mark are contained in the separate module guides.}

Rule M6.6 ASSESSMENT RULES

Refer to the assessment rules for the School of Clinical Medicine (Rule M4) and the School for Allied Health Professions {Rule AGB 1.5-1.13}.

Rule M6.7 PASS REQUIREMENTS

- (a) Students must pass all modules in the LOP.
- (b) To pass a module a final combined mark of at least 50% must be obtained.
- (c) A subminimum of 40% is applicable for the examination mark.
- (d) A student must pass the modules BMBL 1524, BMMT 1524, BMMP 1524, MMTL 1524 and MPDI 1524 with an average mark of 70% or higher to be considered for possible readmission to the first year of the MBChB programme

APPENDIX K

HPCSA 2017 MBChB Accreditation Report (only relevant pages to the study are attached)

**MEDICAL AND DENTAL PROFESSIONS BOARD
OF THE HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA**

Document Strictly Confidential



ACCREDITATION OF UNDERGRADUATE EDUCATION AND TRAINING

IN MEDICINE

FACULTY OF HEALTH SCIENCES

UNIVERSITY OF THE FREE STATE

MBChB CLINICAL TRAINING PLATFORM

BACKGROUND

A comprehensive accreditation visit to the University of the Free State took place over 4-8 May 2015 to accredit the undergraduate medical programme. During that visit the Panel found the programme and related aspects, such as management structures, student selection and support, teaching and learning resources, quality assurance measures, etc. to be sound, with the exception a few problems.

The 2015 accreditation, however, noted serious concerns about the condition of the clinical training platform, which had been raised as a significant issue both in the 2010 report and in a platform-focused visit in 2012. The concerns led the panel to conclude that "unless the training platform is improved, the accreditation of the MBChB Programme is in jeopardy."

Based on the findings of the 2015 accreditation visit, the Board made the following commendations and recommendations:

Commendations

- a. The dedication, motivation and collegiality of the staff for working under difficult circumstances.
- b. Collaboration between the Department of Health, Faculty members and hospital managers to achieve improvements on the training platform.
- c. The Rector for his commitment to the Faculty.
- d. The simulation laboratory and new dissection hall.
- e. The increasing trend in research and publications in general and specifically in terms of education.
- f. The Faculty's commitment to student support.

Recommendations

- a. Maintenance of infrastructure, equipment and consumables has to be addressed urgently.
- b. All IT systems including the PACS system at Universitas Hospital has to be addressed urgently.
- c. Efforts to improving the medical and nursing staff numbers has to be undertaken as soon as possible.
- d. A strict monitoring and control system over RWOPS must be considered.
- e. Sesotho training should be formally introduced in the curriculums in the Faculty to enhance student patient communication.
- f. English as a single medium of instruction should be implemented throughout the undergraduate programme.
- g. Increasing interaction and greater use of the platform for interprofessional learning.
- h. Support to the Kimberley training platform both by the University and the Provinces involved to maintain a high standard of clinical teaching and training in the satellite site specifically for the registrars.
- i. Kimberley as a satellite site may be utilized for 5th year students initially and may be extended to 4th year students at later stage.
- j. The Trompsburg District and CBE site will only be utilised for training when the hospital is fully operational as expected in 2016.
- k. Recognition of clinical teaching as a component for academic progression for teaching staff.
- l. The Phase reviews of the curriculum should be formalized and fed back to the Faculty.
- m. Staffing shortages in the Pathology disciplines should be addressed urgently with specific reference to an appointment of a Head of Department to Chemical Pathology, an additional Pathologist in both Chemical Pathology and Microbiology and an administrative assistant for Chemical Pathology.
- n. In order to deal with an increase in student numbers and the returning Cuban students an additional dedicated staff member is required for student support.

Final recommendations:

The number of students approved for admission per year to be one hundred and forty (140) with an additional twenty (20) at the discretion of the Faculty leadership and provided that the expanded training platform using Kimberley and Trompsburg Hospitals can be successfully implemented.

The undergraduate education and training programme in Medicine be accredited for a period of five (5) years.

The adequacy of the clinical platform be assessed in two years' time in 2017. Failure to achieve a satisfactory platform might result in suspension of accreditation.

THE MAIN TASKS OF THE VISITING PANEL

The purpose for the current accreditation visit (two years after the 2015 visit) was therefore, primarily to revisit the clinical training platform, although the Panel also investigated changes implemented since the 2015 accreditation, particularly progress made in response to the recommendations, and related aspects.

This accreditation report will, therefore, focus on the clinical training platform. Only where changes were found since the previous visit with regard to other aspects of the programme or related to it, will these be reported.

PROGRAMME

The programme for the 4-day visit is attached.
(See appendix 1)

EXECUTIVE SUMMARY

During the 2015 accreditation visit, a significant concern noted was the adequacy of the clinical training platform, with respect to a shortage of medical and nursing staff and of medical specialists in particular, poor maintenance of infrastructure of the hospitals, lack of adequate equipment and consumables for patient care, staffing and other challenges in the pathology disciplines and non-functional IT systems. These conditions had a major effect on teaching and service provision. It was therefore decided that a follow-up visit be undertaken in 2017.

Significant improvements have occurred, and staff morale is definitely better, though there remain challenges. Staff numbers in both the clinical and basic sciences have improved, and plans are still in progress to appoint additional specialists. While a number of the disciplines still feel stretched, and students report challenges in some disciplines, the situation has clearly stabilised. The appointment of teaching and learning coordinators in the major clinical disciplines has also helped this. The appointment of a head of chemical pathology and establishment of a School of Pathology have addressed problems in those disciplines, but lifting the suspension of registrar accreditation in chemical pathology would further assist. Hospital infrastructure, equipment and consumables as well as the IT systems are being addressed. A high level task team has been established between the university and the Free State Department of Health that is driving improvements.

Using Kimberley Hospital as a satellite training facility has been put on hold, but there is openness on both sides to resume discussions. High level engagement in this regard is recommended. Greater use of 3 Military Hospital as part of the training platform would also ease pressure of numbers.

The development of the Trompsburg Campus and establishment of CBE training there and in Botshabelo, as well as and IPE in Trompsburg, are important developments. There is potential for

future growth. However, it would be difficult for the current platform to accommodate significant numbers of Cuban-trained (or other) students, so urgent attention needs to be given by the Free State province to addressing the requirements provided by the faculty in order to expand the training platform to other facilities that have been identified in the province.

EVALUATION OF THE SELF-ASSESSMENT QUESTIONNAIRE

A comprehensive self-assessment questionnaire (SAO) was provided, with extensive annexures, and all resources required were provided on site.

The information was comprehensive - far more so than required of a clinical training platform accreditation - and the panel expressed sincere gratitude to the team who provided all these details. (It is recommended that the UET going forward give clear guidance regarding the requirements for platform accreditations, especially in terms of the SAO to avoid the unnecessary work being expected of receiving programmes.) There were areas that required clarification or additional information, which were very readily provided to panel members.

STRUCTURE OF THE REPORT

Using the latest annual report (2017) by the University of the Free State on the MBChB programme, the panel provides comment on each of the specific recommendations of the 2015 accreditation visit.

Thereafter, because the focus of the visit was on the clinical training platform, the panel provides specific input on the clinical training sites visited and on the major clinical disciplines.

Following this, specific comments are made, where relevant, on the areas usually covered in accreditation reports. (The SAO is taken as appended and read, so information from the SAO is not repeated.)

Finally, commendations and recommendations are provided.

	academic complexes. The control will be in line with national guidelines taking into account local requirements and needs. Impact on educational and service delivery activities will be strictly monitored jointly.	doctors, hospital management and FSDOH in a responsible manner so that teaching time is protected. The matter was raised in the meeting with FSDOH, which indicated that mechanisms will be implemented for monitoring of the new RWOPS policy. RWOPS was also discussed at the meeting the panel held with HoDs, who indicated this is being addressed in clinical departments, though better communication is needed amongst all parties.
A.1.5 Sesotho training should be formally introduced in the curriculums in the Faculty to enhance student/patient communication.	An ad hoc appointment was made in 2017 to assist with Sesotho language skills training in Semester 1 of the M.B., Ch. B programme in the MGEN 1513 (General Skills module). Me Sophy Machedi (retired) has been appointed to facilitate a feedback session after community clinic visits. Non-availability of support / staffing from the UFS Department of African Languages has meant that the School of Medicine will make use of ad hoc appointments and existing staff members' capability in terms of communication skills training in Sesotho during Phase II (MCLI Clinical Skills module) and Phase III (MFAM Family Medicine module). Dr M Labuschagne has approached a retired Registered Nurse to assist with Sesotho training in the MCLI module, and Dr A Bezuidenhout (Teaching and learning coordinator at Dept. Surgery who is fluent in Sesotho) will assist with training in the Family Medicine module.	This has been done. The students reported that the training is basic and not very helpful to them as the content was predominantly medically focused, which limited the interaction they were able to have with patients. Students indicated a preference for conversational Sesotho, and not just a narrow healthcare-related focus. This should be discussed with students to establish what would be most helpful to them.
A.1.6 English as a single medium of instruction should be implemented throughout the undergraduate programme.	From January 2017, the Faculty of Health Sciences, School of Medicine, adopted the revised Language Policy of the UFS as one of three faculties to do so. The first-year class of 2017 is accommodated as one class, English only medium of instruction. Tutorial support is given to students in Afrikaans where necessary. All students receive tutorial support in English. The Centre for Teaching and Learning (CTL) at the UFS is in the process of assisting Faculties through Teaching and Learning managers to provide assistance with tutorial support in Sesotho. The School of Medicine has supplied an existing glossary of terms to the Faculty of Health Sciences Teaching and Learning Manager for updating with the help of CTL (Sesotho-Afrikaans-English glossary). Tutorial support was provided in Semester 1 2017 by means of the input of Me Machedi in the General Skills module.	This has been implemented in 1 st year without significant problems being reported.
A.1.7 Increasing interaction and greater use of the platform for interprofessional learning.	All Semester 7 and 8 (fourth year) students in the School of Medicine rotate at decentralised clinical training sites for a total of four weeks. Two weeks Community Based Education (including one week Interprofessional Education) in Trompsburg, Southern Free State. The Faculty of Health Sciences has developed accommodation and educational facilities in Trompsburg. Students reside for the two-week period in Trompsburg. Transport is provided by the Faculty of Health Sciences. Students participate in a programme of activities across the spectrum of primary health care, including clinic visits, mobile clinic outreach as well as school and other community site visits. Each member of the interprofessional team is included in the module	<ul style="list-style-type: none"> • Interprofessional education and training (IPE) in the Faculty of Health Sciences has been increased. It is in place on more than one platform (e.g. MUCPP and Trompsburg). The IPE in Trompsburg is organised and coordinated by Dr Rene Botha. • Family medicine plays a leading role in the other placement in the greater Bloemfontein area. All 4th year students rotate through various decentralised clinical training sites for a period of four weeks. <p>Two weeks Community Based Education (including one week Interprofessional Education) in Trompsburg, Southern Free State. The focus of the students' activities include exposure to primary health care, in the form of clinic visits, mobile clinic outreach through school and</p>

	<p>outcomes. Students complete a reflective process in the form of a digital photo story as part of the debriefing on their IPE-CBE experience. Facilitators from the Faculty of Health Sciences CBE team visit students on site, and supervision is also provided by staff employed at the primary health care sites in Trompsburg.</p> <p>Regarding the 2 weeks in the Southern Free State, the 1 week "Faculty IPE" (when all Schools on platform) and "Modified IPE" (when School of Medicine students are alone) continues. Mrs M Wilmot is the resident facilitator in Trompsburg who participates as facilitator and oversees the coordination of the IPE week. No problems have been reported.</p> <p>The 1 week CBE continues at the Trompsburg and Springfontein clinic where students are supervised by Department of Health appointed professional nurses. Where possible, 1 – 2 weekly Dr Kleingeld (private GP, sessions at the clinic), will see patients at the clinic and students will attend these sessions. The staff supervising the students are Department of Health appointees with no affiliated lecturer status.</p> <p>On Wednesdays an Occupational Therapy initiative, "Youth Leadership" programme was implemented. All students present on the platform assist on Wednesday afternoon</p> <p>Two weeks CBE is done in Botshabelo, Free State. Students are transported daily to and from Botshabelo hospital (approximately 50 km from Bloemfontein). Students rotate in the hospital clinical areas, as well as in the community clinics under supervision of a Family Practitioner. Student feedback on these rotations is very positive, as they experience it as authentic and realise their role and value in the healthcare team.</p>	<p>community site visits.</p> <ul style="list-style-type: none"> • Module outcomes are Included for each member of the Interprofessional team. Students complete a reflective a digital photo story as part of the debriefing on their IPE-CBE experience. Facilitators from the Faculty of Health Sciences CBE team visit students on site, and supervision is also provided by staff employed at the primary health care sites in Trompsburg. • An Occupational Therapist serves as the resident facilitator at Trompsburg and additional facilitators are provided from the other participating disciplines.
<p>A.1.8 Support to the Kimberley training platform both by the University and the Provinces involved to maintain a high standard of clinical teaching and training in the satellite site specifically for the registrars.</p>	<p>During a telephonic meeting held with Dr Saeed, Clinical Head of Kimberley Hospital in April 2017 he indicated that due to staff shortages it is no longer possible for the Kimberley Hospital to assist with undergraduate student rotations at this hospital for the interim. During 2017, no student rotations have been possible at Kimberley hospital for this reason.</p> <p>Students have rotated at hospitals outside the Bloemfontein academic complex including the following:</p> <ol style="list-style-type: none"> III Military hospital (Anaesthesia) Botshabelo hospital (CBE) 	<ul style="list-style-type: none"> • The registrar programme is struggling to get off the ground. An MOU between UFS, FSDOH and NCDOH is essential to implement a registrar recruitment and rotation plan for the Northern Cape. • A sustainable registrar platform is required to sustain an undergraduate student platform as well. Discussions must start between academic departments of UFS and clinical departments in Kimberley in this regard. • FSDOH indicated that there is going to be a meeting with NCDOH soon to address this issue. No timeline was given.
<p>A.1.9 Kimberley as a satellite site may be utilized for 5th year students initially and may be extended to 4th year students at later stage.</p>	<p>See note above regarding the interim unavailability of Kimberley hospital for student rotations due to staffing shortages.</p>	<ul style="list-style-type: none"> • It was noted that Kimberley Hospital as a training platform for undergraduate students in the final year and for registrars has not materialized. The reason was the perceived understaffing of the hospital and the high cost to the University of accommodation for students, which was unsustainable. Hence, the pilot project in Family Medicine and Paediatrics collapsed. • The panel had a teleconference with the management of Kimberley Hospital. The panel felt that this hospital had adequate supervisory staff to introduce final year students in the platform. However, there needs to be cooperation between UFS, FS DOH and NCDOH to make this happen. The crucial issue of student accommodation and transport need to be

		finalized. The methods of delivery of training and assessment need to be agreed upon; it is suggested that the individual clinical departments meet with their Kimberley counterparts to discuss this.
A.1.10 The Trompsburg District and CBE site will only be utilised for training when the hospital is fully operational as expected in 2016.	Since January 2016, fourth year students (Semester 7 and 8) have been placed at Trompsburg. Students participate in Community-based education activities for a period of two weeks (this includes clinic visits, school visits, and mobile clinic rotations). The Faculty of Health Sciences IPE programme (involving the Schools of Medicine, Nursing, and Allied Health) runs for 18 weeks during the year, while School of Medicine students rotate at Trompsburg for 36 weeks of the year. The Alfred Nzula hospital in Trompsburg is not yet open. Free State Health MEC, Butana Komphela, said in an answer to a question in the provincial legislature, his department advertised 77 posts for the hospital but admitted that the hospital needs a staff complement of 196. The date of 15 June 2017 is set for the opening of the hospital.	<ul style="list-style-type: none"> • While the district hospital is not yet functional, the Trompsburg Campus is already in use, for CBE and IPE as described. Students visit clinics, homes and schools in both Trompsburg and Springfontein. This is a very positive programme with strong engagement with and in the local community. The approach of starting in the community ahead of the hospital being operational is likely to have beneficial spin-offs; impact is already being seen in the community. • The new hospital has opened its emergency centre, but is not yet admitting patients; it is likely this will happen soon as appointments are currently being finalised and there is pressure because of the emergency centre being functional. It is potentially an excellent site for family medicine training, as well as community obstetrics and paediatrics; with the accommodation available at Trompsburg campus, there is great potential for development. It is recommended that family medicine takes a lead in developing further training at the outset, before hospital routines are fully established i.e., get students in on the ground level so that they become part of the system.
A.1.11 Recognition of clinical teaching as a component for academic progression for teaching staff.	The academic promotions policy is under review by the top management of the UFS. Faculties are participating in providing inputs to the task team. The deadline for inputs is 26 May 2017.	<ul style="list-style-type: none"> • This was raised during the meeting of the panel with hospital management as well as in a meeting with the Vice-Rector (Academic) and NHLS. • Academic staff employed by the UFS are promoted based on the criteria as set out in the UFS policies for staff promotion. These include recognition for the scholarship of discovery, teaching and engagement. The evaluative standards are organized in terms of scholarly output productivity, academic mentorship, capacity-building and support, recognition, participation, fundraising and other value-adding activities within the scholarly community, National Research Foundation (NRF) rating and educational qualifications, excellence in teaching and learning, integration of teaching practice and community engagement with the scholarship of discovery and integration of community engagement with the scholarship of teaching. • The Vice-Rector informed the panel that the academic promotions policy is under review by a task team comprising of the top management of the University. Faculties are participating and providing inputs to the task team. The vice-rector expects a greater focus on teaching and learning to be included in the revised policy. • The NHLS is embarking on a national process of proficiency assessment to align staff competencies with salaries. The importance and significance of teaching is incorporated within this assessment. Specific details on the possible weighting of teaching is not currently available.
A.1.12 The Phase reviews of the curriculum should be formalized and	Curriculum review is done on a constant basis in all three Phases of the M.B.,Ch.B. programme. Inputs from the Phase committees are presented to the M.B.,Ch.B.	<ul style="list-style-type: none"> • Apart from those issues addressed within the area of clinical training, only one significant concern was noted by the panel, which is dealt with below.

<p>fed back to the Faculty.</p>	<p>programme committee. The latter committee reports to the Education and Quality Assurance committee of the School of Medicine and to the Executive Committee of the School of Medicine. Changes: [Only one area of concern is presented from the list in the annual report]</p> <ul style="list-style-type: none"> Biochemistry and Clinical Pathology should be presented by NHLS staff members and not by the Department of Basic Medical Sciences. <p>Due to the lack of staff in Pathology departments training was adversely affected. Dr De Villiers was already busy with discussions in order to increase the input of Dr Hayden (Chemical Pathology) in the MMOL modules. Integrated sessions (Biochemistry and Chemical Pathology) had already been incorporated for semester 2 of 2016 and lecturers are revising content for semester 3. In the interim, Dr Hayden has left the UFS, and Professor Kuyil (post-retirement contract appointment) is responsible for the Chemical Pathology lectures in Semester 2 and 3. Dr Naicker, newly appointed Head of Department Chemical Pathology has indicated that she will provide inputs regarding Chemical Pathology in the curriculum.</p> <p>The following summary of the M.B.,Ch.B. programme retreat held in May 2016 is included (Formulated recommendations to School of Medicine Executive Committee based on discussion): [The recommendations are not presented here, because there were no issues address by the panel; it was however noted that there were discussions about a 5-year versus a 6-year programme, with no conclusion being presented.]</p>	<ul style="list-style-type: none"> Significant improvement in the NHLS staffing has stabilized the ability to provide undergraduate teaching. The undergraduate programme for pathology is currently functioning well for most departments. Chemical Pathology is still in need for support from the Biochemical Sciences concerning undergraduate teaching. Dr Naicker (newly appointed Head of Chemical Pathology and Head of School of Pathology) is committed to building a stronger department with a stable core consultant complement, which will enable active recruitment of registrars to supplement undergraduate teaching. Dr Naicker is also actively involved with curriculum renewal and producing a blended learning platform that can ensure undergraduate teaching even with a limited staff complement. It is clear that the decision was to continue with the 5-year curriculum. No staff or students raised concerns about this. Recent graduates expressed strong support for the 5-year curriculum, stating that they were very well equipped for internship, felt on a par with interns trained in other medical schools and were at least as good as but probably better than their peers when it came to practical, hands-on skills.
<p>A.1.13 Staffing shortages in the Pathology disciplines should be addressed urgently with specific reference to an appointment of a Head of Department to Chemical Pathology, an additional Pathologist in both Chemical Pathology and Microbiology and an administrative assistant for Chemical Pathology.</p>	<p>The Head of Department Chemical Pathology, Dr Jocelyn Naicker, was appointed in 2017 and is currently in position. Prof J Kuyil is post retirement, and is assisting in the Department Chemical Pathology on a contract basis, lecturing to undergraduate students. Interviews for the Head of Medical Microbiology were held and the new head of Department will start in January 2018. In the meantime, an additional post-retirement appointment of a specialist (Dr Coovadia) was done in the Department of Medical Microbiology</p>	<p>Staff shortages have been addressed by the NHLS:</p> <p><u>Current consultant vacancies:</u></p> <ul style="list-style-type: none"> 1 Anatomical pathologist: to be filled following the college examinations 1 Haematologist: to be filled 2018 <p><u>Current registrar vacancies:</u></p> <ul style="list-style-type: none"> 1 x Anatomical Pathology: ASAP Chemical Pathology: Suspended accreditation (refer to report) 1 x Microbiology: January 2018 1 x Virology: ASAP <p><u>Chemical Pathology:</u></p> <ul style="list-style-type: none"> Dr Naicker appointed as Head of Department. Prof J Kuyil appointed in a post-retirement post to assist in the department on a contract basis. A stable long-term consultant core in the department needs to be established in preparation for Dr Naicker's future retirement and to fill Prof Kuyil's post-retirement position. Suspension of the post-graduate training platform needs to be addressed to ensure recruitment of registrars to complement the core staff and

		strengthen the undergraduate platform. <u>Microbiology:</u> • Currently acting Head of Department to be replaced by permanent position in January 2018. • Post-retirement appointment of Dr Coovadia.
A.1.14 In order to deal with an increase in student numbers and the returning Cuban students an additional dedicated staff member is required for student support	Current positions: Academic coordinator for CBE, Cuban trained students and decentralized training platforms. Appointed April 2016. Due to the large number of Cuban-trained SA students expected to return for final training from July 2018, the School of Medicine and Free State Department of Health have been in constant communication regarding staffing requirements. The School of Medicine has indicated that should training take place at decentralised sites as planned, academic coordinators should be available at each site, as well as academic support staff. Administrative support for Phase III, CBE and Cuban-trained students. The clinical student administrator (6/8 position) was appointed in July 2015. Psychological support for the undergraduate medical programme: a clinical psychologist (6/8 position) was appointed in September 2015. No appointments have been made of additional staff for student academic support and development, as well as a social worker to assist with managing students' personal and financial needs. The interaction with the Free State Department of Health is crucial in this regard.	• The Free State (FS) province is committed to accommodating approximately 115 of the 720 students returning from Cuba in July 2018, based on their wish to place all FS students in the FS. According to the faculty, the existing training platform can only accommodate 20 students. It means additional training facilities needs to be identified and prepared for the additional 95 students. This includes assessment of trainer availability, train the trainer programme, and other infrastructure requirements like accommodation, transport, IT support etc. There has been a need identified by UFS to appoint training coordinators in each Clinical training site, and ensure that all clinical departments are staffed with at least two consultants. • Kimberley hospital needs to come on board as well as the other identified sites in the Free State. It requires coordinated efforts of the participating hospitals, UFS, FSDOH and NCDOH to achieve this goal. • HPCSA will then need to accredit these sites. • This matter was raised in the meeting with FSDOH. A sense of extreme urgency is needed for this important project.
B. Changes or Innovations to Curriculum		
Change / Innovation	Update: Year 2 after accreditation (2017)	
B.1 English only medium of instruction	The Faculty of Health Sciences became one of three faculties at the UFS to implement an English only language policy for all first year students from the start of 2017. Therefore, there is only one first year class. Students from second year and further are still accommodated in two streams (English and Afrikaans) as per the UFS parallel medium language policy, which will be gradually phase out.	As above
B.2 Expansion of Community-based education activities	From January 2017, students have also attended a two week rotation at Botshabelo hospital (a regional hospital approximately 50 km from Bloemfontein) where students participate in both hospital-based activities and community clinics. The students are supervised by a Family Medicine specialist located at the hospital. Students are transported daily to and from the hospital by means of transport provided by the School of Medicine. Students have consistently described the rotation at Botshabelo hospital most enjoyable and educational.	The placement of students at Botshabelo was welcomed by students and recent graduates. It is noted to be a good site for training, though there are issues in the programme that need to be addressed (see 2.8 below), and is complemented well by Trompsburg, providing more of a peri-urban township experience to balance the rural experience. The only question is how community-based education is integrated into the curriculum i.e. how are the outcomes incorporated into the clinical disciplines.
B.3 Selection policy revision	The selection policy has been revised and the revised policy approved by the Rectorate. Some revisions include the following: NSC:NBT ratio changed from 80:40 to 70:30; NBT requirement for senior students waived	These are welcome changes

4. SPECIFIC COMMENTS

4.1 STUDENT SELECTION, ADMISSION AND NUMBERS

Admission criteria have been amended to ensure 70% representation of previously disadvantaged groups (Black, Coloured and Indian students) and a minimum of 40% male students has been set to ensure male representation. This along with English as the medium of learning should alleviate previous disparities.

Even though the accredited number each year is 160, there were 176 students in first year because of inclusion of students from the learning development programme (LDP). This needs to be addressed without necessarily disadvantaging new admissions. Increasing the accredited numbers of students is one strategy. Developing a parallel course to assess suitability into medicine is another option.

4.2 STUDENT PROGRESSION AND ACHIEVEMENT

The expanded intake into the first year has led to more students being directed for additional academic development and support. Despite these efforts, the faculty reported a higher number than usual of repeating first year students (16) which impacted on the faculty exceeding the allocated 160 for which they that previously been accredited, despite the numbers in the LDP not being significantly higher than previous years (2017-16; 2016-8; 2015- 11).

A full interrogation of the students' progress and achievement should be undertaken during the 2020 accreditation to review the impact of the new admissions policy and changes to the medium of instruction on student progress and achievement.

4.3 STUDENT DEVELOPMENT SUPPORT

The School of Medicine has employed a Clinical Psychologist on a permanent basis since August 2015 to address psychological support to students. This is in addition to the existing Division of Student Academic Development and Support (now called Division of Student Learning and Development) in the Faculty of Health Sciences. The clinical psychologist provides services to all students in the MBChB programme, and to the Cuban-trained South African students. Where necessary, referrals are made to other healthcare professionals.

An academic coordinator for CBE, Cuban trained students and decentralized training platforms has been appointed.

The School of Medicine anticipates that psychological support would be required at decentralised sites. Teaching and learning coordinators have been appointed in all the main clinical disciplines. There is an extensive waiting period with only one psychologist to serve the School of Medicine at present, but students are also referred to Kovsie Counselling services on campus for urgent problems.

Appointments are yet to be made in terms of additional staff for student academic support and development, and a social worker to assist with additional personal and financial needs of the changing student population.

4.4 STAFF DEVELOPMENT AND TRAINING

The faculty does not have a formal staff development policy but a variety of staff development opportunities are presented. These are predominantly aimed at newly appointed lecturers and the sessions are more frequently attended by staff teaching in the preclinical years.

Various departments in the Faculty of Health Sciences also organise personnel development sessions in collaboration with the Division of Health Professions Education. The Clinical Simulation and Skills Unit Skills offers various CPD activities. Teaching and learning coordinators have been trained to assist students in the major disciplines. Various facilitators rotate through the Trompsburg CBE complex.

U

The Division of Health Professions Education offers formal programmes, which include Masters and PhDs in Health Professions Education.

The Division provides structured programmes to support teaching staff, with the most recent sessions focussing on upskilling in assessment. The evaluation of teaching performance is linked to module evaluation.

4.5 LEARNING RESOURCES

The panel noted that students do not have Wi-Fi access in Pelonomi, and some of the decentralised sites. Evidence-based practice should be taught, demonstrated and used in bedside teaching and patient care, in order to ensure this becomes part of everyday behaviour of students as they become graduates; this requires internet access.

Students report that they are taught one way in the medical school (such as in the Clinical Simulation and Skills Unit) but then have to practice another way in reality because of shortages of certain consumables or equipment. The Faculty has addressed this by supplying medical consumables to some extent, but this is not sustainable.

4.6 HUMAN RESOURCES

Medical Staff needs

There has been a net loss of 29 specialists since 2015 in Universitas hospital and around 10 in Pelonomi Hospital. The panel was informed that 45 specialists are being recruited this year and funding is available for the same.

Both hospital complexes provided their medical staff structure and vacancy situation (which are available as PowerPoint presentations).

The present training FTE of 370 needs to be raised to 400 to sustain the clinical teaching platform and also for increasing the student numbers especially taking into consideration the students returning from Cuba in July 2018.

4.7 RESEARCH AND OTHER PUBLICATION OUTPUTS

The increase in publications by the faculty as reported in the SAO is commendable, especially in the context of human resource constraints.

4.8 MANAGEMENT/ORGANISATIONAL STRUCTURES

Changes in governance, management or organizational structures since the 2015 accreditation visit include the following:

- a. Vision, mission, values and objections:

The Faculty formulated and approved the new vision, mission, values and objectives in 2016.

- b. Diagrammatic representation of the management and reporting structures responsible for the overall governance and management of the Faculty to ensure effective planning, organization, leadership and control:

Changes in the organizational structure were finalized in 2017, most notably with the formation of the three separate schools that together form the School of Medicine:

- The School of Clinical Medicine
- The School of Biomedical Sciences
- The School of Pathology

The Head of the School of Medicine chairs the Executive in the School of Medicine, and is a member of the Faculty of Health Sciences Executive, as well as the Faculty of Health Sciences Management and Board meetings and School of Medicine Education and Quality Assurance Committees.

With the new structure, the chair will rotate between the Heads of School of Clinical Medicine, Pathology and Biomedical Sciences.

d. The structure responsible for the overall management of the **undergraduate medical education programme:**

The general management structure remains unchanged. A detailed breakdown of the office of Programme Management staff includes the Programme Director, the Programme Organiser, a senior Professional Officer providing a-learning and estate management assistance, a Technical Assistant, a Typist/Administrative trained student academic coordinator (currently vacant) and a Clinical Psychologist (5/8 position).

Membership of the Programme Committee includes the Programme Director, phase chairs, representatives from module leaders in Phases I, II and III, representative, representatives from Division Student Academic Development, representative from Student Administration and Undergraduate Programme, Faculty of Health Sciences Teaching and Learning Manager and student representative.

Membership of the Phase Committee includes the phase chair, administrative staff, Programme Director, module leaders and representatives from Student Administration and Undergraduate Programme.

e. Involvement of junior staff and students in the processes of groups and bodies:

Junior staff/lecturers and module leaders are represented especially in the Phase committees and Programme committee meetings. Committees are elected and appointed as part of an official process for a three year cycle, except in the case of ex-officio members who are permanently part of a committee.

f. Student leadership structures that represent the undergraduate students:

Unchanged

g. Community involvement in the governance of the Faculty:

This is via the CBE programme, ethics committee and the Joint Advisory Committee. There is a Portfolio member of the Exco of the School of medicine for service delivery who is also the chairperson of the Universitas Academic Hospital board, and thus has ties within the community. Community involvement from the Trompsburg community, in particular, increased following the opening of the Trompsburg site for CBE/IPE.

h. The formal platforms for engagement between the Faculty and the community:

- CBE/IPE platform & Community Service Learning Committee
- Faculty Ethics Committee
- Joint Advisory Committee.
- Alumni Membership on the UFS council

4.9 TEACHING AND LEARNING

Students generally get good patient exposure and opportunities to perform various procedures. Transition from being students to interns seem to be smooth. Recent graduates found the transition easy.

There is a heavy reliance on registrars for bedside teaching and sometimes to present lectures to students in the clinical training platform. To ensure consistency in teaching the registrars must have an induction programme to empower them to teach students based on appropriate teaching methods and on focussing the curriculum.

Teaching in disciplines like Dermatology, Nephrology, Orthopaedics, Obstetrics and Gynaecology and Surgery needs to be strengthened.

Consistency in assessment needs to be ensured.

The psychiatric hospital needs to look at ways and means to accommodate more students. The present teaching methods look excellent.

The availability of video screens in theatre can ensure that an increasing number of students can gain access to the viewing of various surgical procedures.

The students felt that mixing locally trained students and Cuban trained students is to be encouraged for mutual support and learning.

The appointment of teaching and learning coordinators in clinical disciplines is commended and should be encouraged going forward as it ensures uniform training and also can supplement the trainers on the platform.

The faculty should look at providing N95 masks for students for infection control.

Toilets and bathrooms in the hospitals must be fixed especially in Universitas.

Student transport needs to be looked into, to ensure that less-resourced students are not disadvantaged in terms of accessing sites away from the university campus.

4.10 GENERAL CLINICAL TRAINING

While the SAQ implied that priority health needs are addressed through family medicine and CBE, on probing it is clear that attention is given to these throughout the clinical modules. It would be helpful if this would be made more explicit for staff and students i.e. that there is a focus on the burden of disease encountered in the communities served and the priority health issues that are faced by South Africans, including disease prevention and health promotion.

In relation to this and particularly the problem of chronic illnesses, in terms of both non-communicable and communicable disease, there does appear to be major curricular emphasis on acute and curative care. Students have very little exposure to the issues of managing chronic illnesses on an ongoing basis. Furthermore, there is no opportunity in the curriculum for students to experience continuity of care as rotations are mostly fairly short (even in the longer rotations, students are constantly being moved to different sites, units or sub-specialties). It is recommended that the School of Clinical Medicine works towards the development of a continuity experience for students. There are many such examples that can be followed, such as a chronic patient attachment, a family attachment, regular attachment to an identified clinic across a number of years, etc. There is also the potential for the development of a longitudinal integrated programme in a number of sites, but this would only benefit a small number of students.

A number of final year students indicated to us that they had not received sufficient preparation in primary care, in other words in the clinical care and management of patients with common ailments that would not usually find their way to hospital. They felt there was limited exposure, which was confirmed by some of the faculty they work with in the community. A significant proportion of family medicine training has been hospital-based. It is recommended that attention be given to the possibility of more extended health centre or clinic-based exposure to undifferentiated patients and

the range of problems presenting at this level. This should include support for students towards the development of clinical reasoning in terms of the decision-making in such patients, including triage, decisions around referral, managing resources and utilising the broader inter-sectoral team in management.

interprofessional education (IPE) is a strength, both in terms of the preparation sessions in IPE with all 4th years in the faculty and the experience in Trompsburg of team-based screening in schools and working with lifestyle groups in communities. The challenge is to ensure that IPE and inter-professional practice are integrated across clinical rotations and not seen as something that only happens outside of the major hospitals.

The biopsychosocial approach is recognised to be important, but in the SAQ it was presented as being taught only in the family medicine modules. While it was noted that psychiatry also propagates the model, ways should be explored to integrate this approach as fundamental to health care across the clinical disciplines. Important steps already in place are the practice of working together on end of year assessments, bringing in people from different departments to clinical assessments, the integrated clinical assessments and the systems-based integrated approach in the late phases.

In terms of identifying additional clinical sites for training, criteria have been compiled to identify the requirements of sites, which will aid expansion to new sites.

The Simulation and Clinical Skills Unit is an excellent resource that prepares students well for their clinical involvement. The amount of time dedicated to developing clinical skills and providing simulation experience to students is impressive. Students cite the recently introduced surgical skills week, prior to the surgical rotation, as a very useful development. ESMOE training and ongoing paediatric procedural training are also important.

4.11 PROGRAMME GOVERNANCE

Curriculum review is ongoing and students attest to the positive impact of the changes on their learning. Inputs from the Phase committees are presented to the MBChB programme committee. The latter committee reports to the Education and Quality Assurance Committee of the School of Medicine and to the Executive Committee of the School of Medicine.

The number of changes/amendments were reported in the **SAQ**, particularly for Phase I

5. COMMENDATIONS AND RECOMMENDATIONS

Commendations:

- a. The dedication of the staff to continue with intense teaching engagement, even in the face of health service and staffing challenges.
- b. The development of the Trompsburg campus
- c. Introduction of the CBE and IPE programme in Trompsburg and Springfontein.
- d. Appointment of the teaching and learning coordinators across the major clinical disciplines
- e. The introduction of formal research in the undergraduate programme
- f. The preparedness of graduates for internship and the strong sense of pride in the programme shown by graduates and students

2:

- g. The engagement of the Faculty and Free State Department of Health to address challenges, supported by the recent establishment of a task team by the rector and head of health.
- h. The leadership of the dean in supporting the decentralized platform development.
- i. The high-quality Simulation and Skills laboratory and the introduction of the surgical skills training prior to the surgical rotation.
- j. The introduction of English as a single language of tuition.
- k. The increase in the Faculty's research output despite the human resource challenges experienced.

Recommendations:

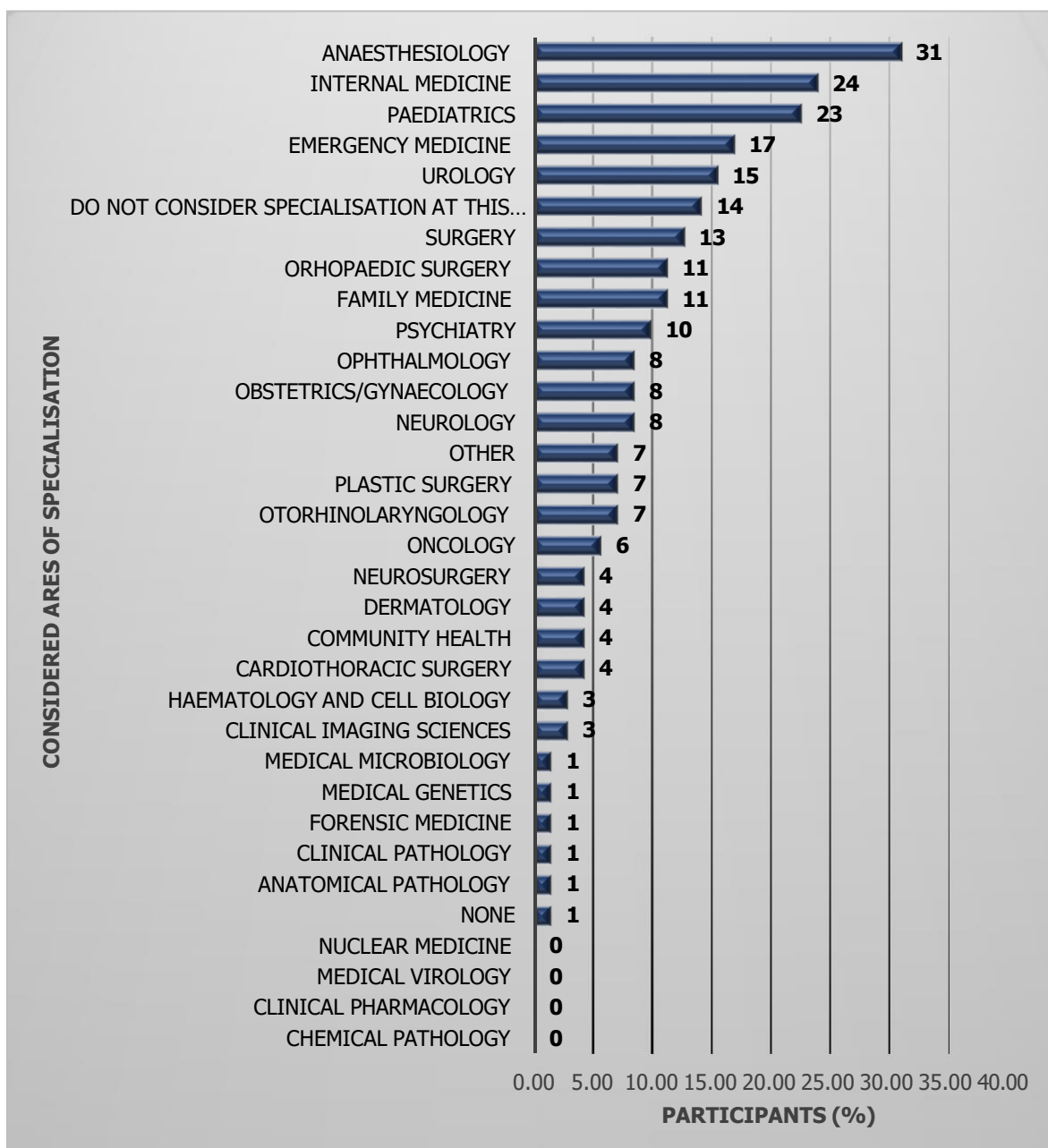
- a. Continue developing the training potential of the Trompsburg platform and community, especially given the availability of the new Free State campus and the new hospital.
- b. Family medicine should take a lead expansion of district-based training in Trompsburg, Botshabelo and other sites
- c. Urgent filling of vacant specialist posts and recruitment for posts that become vacant, as per the commitment of the Free State Department of Health.
- d. Recruitment of registrars should be streamlined in order to ensure that there is continuity and to minimize vacancies.
- e. Ensure that there are sufficient functional hygienic ablution facilities for students, in particular in Universitas Hospital
- f. Address the issue of regular transport for students to clinical sites within the Bloemfontein academic complex, to ensure students who are less resourced are not disadvantaged
- g. There should be engagement between the Faculty and Kimberley Hospital to extend the training platform there, both at leadership level and at the level of clinical departments. The departments of health of both provinces should be active participants in this process.
- h. The urgent development of additional sites as a training platform for NMFCMC students will require active engagement between the Faculty and the Free State Department of Health, as well as the support of the Department of Health to ensure there are clinical teachers and supervisors, adequate training facilities and accommodation for students.
- i. Earlier and greater exposure to primary care within the programme.
- j. Provide students the opportunity to understand and experience continuity in patient care as well as ongoing management of chronic illnesses (including prevention), in addition to the focus on acute care.
- k. The new RWOPS policy must be communicated to clinicians and monitored to ensure training time for students and registrars is protected.
- l. Provide students at Botshabelo with exposure to the greater range of learning opportunities that the site can offer including community outreach.

ADDITIONAL INFORMATION

Distribution of genders by provinces

Variable	Gender		Total (n=71 n (%))
	Male (n=34) n (%)	Female (n=37) n (%)	
Province			
Limpopo	0 (0.00)	0 (0.00)	0 (0.00)
Mpumalanga	1 (2.94)	2 (5.41)	3 (4.23)
Northern Cape	3 (8.82)	1 (2.70)	4 (5.63)
Western Cape	3 (8.82)	4 (10.81)	7 (9.86)
KwaZulu-Natal	4 (11.76)	4 (10.81)	8 (11.27)
Gauteng	4 (11.76)	6 (16.22)	10 (14.08)
North West	4 (11.76)	6 (16.22)	10 (14.08)
Eastern Cape	8 (23.53)	5 (13.51)	13 (18.31)
Free State	7 (20.59)	9 (24.32)	16 (22.54)
Race			
African	2 (5.88)	5 (13.51)	7 (9.86)
White	27 (79.41)	26 (70.27)	53 (74.65)
Asian	3 (8.82)	2 (5.41)	5 (7.04)
Coloured	0 (0.00)	2 (5.41)	2 (2.82)
Other	2 (5.88)	2 (5.41)	4 (5.63)
Internship year			
First year	12 (35.29)	11 (29.73)	23 (32.39)
Second year	22 (64.71)	26 (70.27)	48 (67.61)
Undergraduate completion year			
2018	21 (61.76)	24 (64.86)	45 (63.38)
2019	13 (38.24)	13 (35.14)	26 (36.62)
Age			
Mean \pm sd	25.32 \pm 1.22	25.27 \pm 1.02	25.30 \pm 1.11
IQR	26-25	26-25	26-25
Range	30-24	28-23	30-23
Median	25	25	25

IQR = Interquartile range



The distribution of areas of specialisation by medical interns

This figure above(*cf.* chapter 5) presents the distribution of areas of specialisation being considered by the interns. Most interns were considering specialising in anaesthesiology (31.0%), internal medicine (23.9%), paediatrics (22.5%), and emergency medicine (16.9%). None of the interns were considering specialising in chemical pathology, clinical pharmacology, medical virology, or nuclear medicine.

The hypothesis being tested here is whether there is a difference in the average positive composite core competency scales of first-year and second-year interns of the year 2020 regarding their perceptions of whether there was sufficient assessment during the undergraduate medical programme. The results show that none of the averages of each of the nine scales for first-year interns is statistically significantly different from that of the second-year interns.

Average of the positive composite core competency scale on perceptions of undergraduate programme

NAME OF COMPOSITE CORE COMPETENCY SCALE	YEAR OF INTERNSHIP	MEAN	STD. DEV.	95% CI	P-VALUE
Overall period scale	1st-year internship (n=23)	71.43	21.10	62.30; 80.55	0.6700
	2nd-year internship (n=48)	73.81	22.31	67.33; 80.29	
Medical expert scale	1st-year internship (n=23)	89.13	15.22	82.55; 95.71	0.6472
	2nd-year internship (n=48)	90.89	14.98	86.54; 95.23	
Communicator scale	1st-year internship (n=23)	79.35	23.42	69.22; 89.47	0.2742
	2nd-year internship (n=48)	72.40	25.52	64.99; 79.81	
Collaborator scale	1st-year internship (n=23)	84.06	19.12	75.79; 92.33	0.9956
	2nd-year internship (n=48)	84.03	22.53	77.48; 90.57	
Leader and manager scale	1st-year internship (n=23)	65.22	25.27	54.29; 76.15	0.9249
	2nd-year internship (n=48)	64.58	26.96	56.75; 72.41	
Health advocate scale	1st-year internship (n=23)	84.47	21.50	75.18; 93.77	0.1556
	2nd-year internship (n=48)	91.07	16.31	86.34; 95.81	
Scholar scale	1st-year internship (n=23)	87.92	13.36	82.14; 93.70	0.1906
	2nd-year internship (n=48)	80.79	24.12	73.78; 87.79	
Professional scale	1st-year internship (n=23)	74.88	24.44	64.31; 85.45	0.6855
	2nd-year internship (n=48)	77.08	19.77	71.34; 82.82	
Community engagement scale	1st-year internship (n=23)	56.52	33.61	41.99; 71.06	0.8647
	2nd-year internship (n=48)	55.21	28.59	46.91; 63.51	

Table above (cf. chapter 5) shows the categorised positive composite core competency had scores between 80% and 100%. With the exception of the five – overall internship experience scale, communicator, professional, community-based education, and leader and manager – the majority had scores between 50% and 80% (cf. chapter 5).

The average of the positive composite core competency scale on perception of undergraduate programme

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Community-Based Education scale	1st-year internship (n=23)	56.52	33.61	41.99 ; 71.06	0.8647
	2nd-year internship (n=48)	55.21	28.59	46.91 ; 63.51	

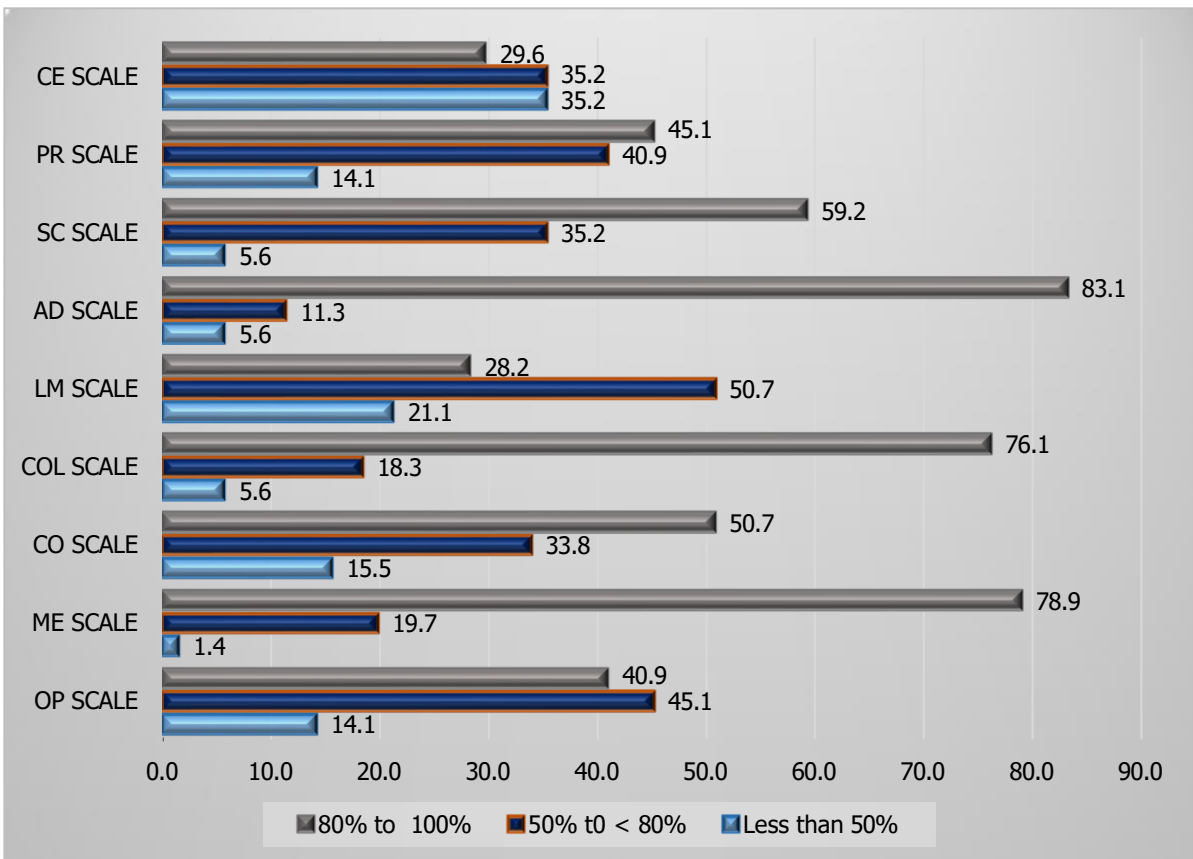
CATEGORISED POSITIVE COMPOSITE CORE COMPETENCY SCALES

The categorised positive composite core competency scales are presented. There is no statistically significant association (all p- values > 0.05) between the categorised scale and year of internship for all the scales. The short names of the scales are used.

The association between positive composite scale and year of internship

POSITIVE COMPOSITE CORE COMPETENCY SCALE NAME	SCALE SHORT NAME	SCALE CATEGORIES	1st-year internship	2nd-year internship	P- VALUE
Overall period scale	OP scale				0.947
		<50%	3 (13.04)	7 (14.58)	
		50% to <80%	11 (47.83)	21 (43.75)	
		80% to 100%	9 (39.13)	20 (41.67)	
Medical expert scale	ME scale				0.526
		<50%	0 (0.00)	1 (2.08)	
		50% to <80%	6 (26.09)	8 (6.67)	
		80% to 100%	17 (73.91)	39 (81.25)	
Communicator scale	CO scale				0.535
		<50%	2 (8.70)	9 (18.75)	
		50% to <80%	8 (34.78)	16 (33.33)	
		80% to 100%	13 (56.52)	23 (47.92)	
Collaborator scale	Col scale				0.494
		<50%	1 (4.35)	3 (6.25)	
		50% to <80%	6 (26.09)	7 (14.58)	
		80% to 100%	16 (69.57)	38 (79.17)	
Leader & manager scale	LM scale				0.777
		<50%	4 (17.39)	11 (22.92)	
		50% to <80%	13 (56.52)	23 (47.92)	
		80% to 100%	6 (26.09)	14 (29.17)	
Health advocate scale	AD scale				0.685
		<50%	2 (8.7)	2 (4.17)	
		50% to <80%	3 (13.04)	5 (10.42)	
		80% to 100%	18 (78.26)	41 (85.42)	
Scholar scale	SC scale				0.353
		<50%	0 (0.00)	4 (8.33)	
		50% to <80%	9 (39.13)	16 (33.33)	
		80% to 100%	14 (60.87)	28 (58.33)	
Professional scale	PR scale				0.305
		<50%	5 (21.74)	5 (10.42)	
		50% to <80%	7 (30.43)	22 (45.83)	
		80% to 100%	11 (47.83)	21 (43.75)	
Community-based education scale	CE scale				0.531
		<50%	9 (39.13)	16 (33.33)	
		50% to <80%	6 (26.09)	19 (39.58)	
		80% to 100%	8 (34.78)	13 (27.08)	

All the categorised positive composite core competency had most score between 80% and 100% except for the overall internship scale, leader and manager as well as the community-based education where the majority had scores between 50% to <80% (*cf.* chapter 4).



The distribution of categorised composite scales

The average of the positive composite core competency scale on perception of undergraduate programme

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DEFINITIONS OF ASSESSMENT METHODS AND THEIR COMPARISON

Written tests – Constructed-response format (short-answer questions)

Definition

The short-answer question (SAQ) format consists of a brief, highly directed question designed to elicit a reliable, constructed response from the learner. Answers usually consist of a few short words or phrases. The model answer key is designed to comprehensively anticipate all correct answers.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributor: Curtis Lee, pp.11

Written tests – Constructed-response format (essays)

Definition

Essays pose questions that require learners to construct an answer based on their knowledge in a written or computer-based format. They require the synthesis and communication of content and often require critical thinking skills such as evaluation, analysis, and judgement.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributor: Curtis Lee, pp.13

Written tests – Selected-response format (multiple-choice, matching, extended matching, pick N, and true-false questions)

Definition

Selected-response assessment tools consist of a question and a list of options from which the learner must choose the correct answer. All selected-response formats ask the learner to recognise the correct answer rather than to recall it without being prompted. Many of these written assessment tools situate the question within a clinical scenario or vignette. Multiple-choice, matching, extended matching, pick N, and true-false questions are common tools within this category.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributor: Curtis Lee, pp.15

Structured oral examinations

Definition

Oral examinations provide an opportunity for an assessor or panel of assessors to pose a series of questions to a learner in order to assess and react to the learner's responses. Oral examinations allow a high level of dynamic interaction between assessor and learner.

Structured oral examinations (SOEs) assess a set number of standardised cases using anticipated probing questions based on the range of expected candidate performance and anchored rating schemata to increase the reliability of the evaluation. SOEs should be used for high-stakes or summative oral assessments. They are usually scored using a predefined, structured template.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributor: Curtis Lee, pp.18.

Direct observation

Definition

In the Royal College model of in-training evaluation, direct observation refers to the ongoing observation, assessment, and documentation of actions taken by learners in real clinical settings during their training period. The critical factor that distinguishes direct observation from other forms of assessment is that the learner is observed performing authentic actions that occur naturally as part of daily clinical experience.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributor: Gary Cole, pp.21

Objective structured clinical examinations and objective structured performance-related examinations

Definition

The OSCE samples the performance of learners as they rotate through a series of stations representing various clinical scenarios. At each station, learners may encounter a standardised patient, a structured oral examination, visual information (e.g., X-ray films, electrocardiograms), a high- or low-fidelity simulation (e.g., part-task trainer), or a written task.

Learners are usually asked to perform a specific skill, to simulate part of a patient encounter, or to answer questions based on the presented material. The objective structured performance-related examinations (OSPPE) is similar to the OSCE but does not necessarily have a clinical focus.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributor: Curtis Lee, pp.23

Standardised patients

Definition

Standardised patients can be either healthy actors trained to simulate a medical situation or condition or actual patients trained to standardise the presentation of their own condition for assessment purposes. They can be included as part of an OSCE station, as part of an oral examination, or as a stand-alone assessment tool. Although standardised patients have been inserted into clinical practice (e.g., on an outpatient clinic list) without the knowledge of the learner being assessed, this practice raises ethical issues.

As with simulations, standardised patients are not assessment tools in and of themselves. Instead, they provide a means to allow the observation of performance that is then assessed using a standardised checklist, anchored global-rating scale, or a brief narrative response.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributors: Curtis Lee and Jonathan Sherbino, pp.26

Multi-source feedback (360-degree evaluation)

Definition

Multi-source feedback (MSF) is often (erroneously) termed 360-degree evaluation or assessment. This type of evaluation originated in organisational and workplace settings in which supervisors, "direct reports", and peers completed forms to gather information, appraise conduct, and provide feedback. MSF uses specific instruments designed to gather data about particular behaviours or professional constructs (e.g., professional and communicator skills) of the learner. In educational settings, observers may include physicians (e.g., resident peers, supervising physicians, and medical

students), allied health professionals (e.g., nurses, pharmacists, and psychologists), patients, and family members. A self-assessment is frequently included. The questionnaires may be the same or different for each of the assessor groups. Feedback is provided in aggregate form for each source. MSF can be used to provide formative and summative assessments, and identify learners with difficulties.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributor: Jocelyn Lockyer, pp.29

Portfolios and logbooks

Definitions

Portfolios provide a flexible, multifaceted means of collecting evidence of the achievement of competence over time. Logbooks are structured instruments for documenting that a learning activity has taken place.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributors: Jason R. Frank, Karen Mann and Erin Keely, pp.32

Simulation-based assessment

Definition

Simulation is the artificial recreation of a clinical environment or circumstance for the purpose of allowing a learner to undertake a specific task in a controlled manner that presents no risk to patients. Simulation can recreate many clinical settings with a degree of realism, allowing educators to observe how individuals and teams may perform in the "real world". Simulation is particularly useful in assessing learner performance of a complete procedure, or in crisis situations that might not commonly be encountered or managed independently during a finite residency.

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributors: Viren N. Naik and Glen Bandiera, pp.36

Encounter cards

Definition

Encounter cards are a type of in-training tool characterised by direct observations that are documented after brief encounters between the supervisor and the learner in a clinical setting. They are also known as:

- daily evaluation cards (DECs);
- daily encounter cards (DECs);
- daily operative cards (DOCs);
- daily shift cards;
- daily teaching evaluation cards (DTECs);
- teaching encounter cards (TECs);
- interaction cards; and
- feedback forms.

Encounter cards may contribute to summative In-Training Evaluation Reports (ITERS).

Source: The CanMEDS Assessment Tools Handbook. An Introductory Guide to Assessment Methods for the CanMEDS Competencies. First Edition. Contributors: Jason R. Frank, Curtis Lee and Glen Bandiera, pp.39. The table below provides a summary of assessment tools, highlighting their strengths and limitations, and how they differ regarding reliability, validity, feasibility, and cost.

Contemporary assessment tools comparison

	RELIABILITY	VALIDITY	FEASIBILITY	COST	STRENGTHS	LIMITATIONS
MCQ	+	+	+	\$	<ul style="list-style-type: none"> Global familiarity Easy to score Extensively researched 	<ul style="list-style-type: none"> Random guessing Difficult to write well Trivialisation of content Can overestimate competence
Essay	-	+-		\$	<ul style="list-style-type: none"> Assess problem-solving Easy to compose 	<ul style="list-style-type: none"> Difficult to score Inefficient Reliability challenges
SAQ	+	+	+	\$	<ul style="list-style-type: none"> Easy to write 	<ul style="list-style-type: none"> Difficult to score
Oral exam	+-	+	+-	-	<ul style="list-style-type: none"> Assess higher-order reasoning Trainee can clarify answers 	<ul style="list-style-type: none"> Time-consuming Examiner cueing Bias issues Standardisation issues
OSCE	+	+	-	-	<ul style="list-style-type: none"> Fidelity Scheduled Assess behaviour in critical events 	<ul style="list-style-type: none"> Deconstructs patient/physician dynamic Limitations of potential simulations Expensive Time-consuming
ITER	-	+	+	\$	<ul style="list-style-type: none"> Assess all domains of competence Flexible Assess behaviour over a period of time Face validity Fidelity 	<ul style="list-style-type: none"> Student characteristics influence assessment of behaviour Poor discriminatory power between domains Reliability issues
MSF	+-	+	-	\$	<ul style="list-style-type: none"> Assess all domains of competence Interprofessional Many raters 	<ul style="list-style-type: none"> Time intensive May affect patient/physician dynamic Reliability issues Requires proper observer training
Portfolios	-	+-	-	\$	<ul style="list-style-type: none"> Self-reflection Facilitates remediation Captures performance over time 	<ul style="list-style-type: none"> Time intensive Misrepresentation Adherence/effort
Logbooks	N/A	+-	+	\$	<ul style="list-style-type: none"> Increases exposure to technical skills Tracking 	<ul style="list-style-type: none"> Assumes repetition Equals competence Time-consuming Adherence/effort

Source: Bandiera, Sherbino and Frank, 2006

+ = indicates a characteristic strength of this tool

- = indicates a characteristic weakness of this tool

+/- = varies depending on design of the tool

\$ = indicates that the assessment tool is inexpensive. Also, the estimation of assessment tool costs does not include faculty salaries.

Abbreviations:

ITER = In-Training Evaluation Report

MCQ = Multiple-Choice Question

OSCE = Objective Structured Clinical Examination

SAQ = Short-Answer Question

MSF = Multiple Source Feedback (also referred to as 360-degree evaluation)