

**Exploring the impact of experience-based medical learning on students' clinical preparedness: A case study of the South-African-Cuban medical training collaboration programme at the University of KwaZulu-Natal, South Africa.**

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## **KEYWORDS**

The South-African Cuban Medical Collaboration Programme

South Africa

Cuba

Context

Curriculum

Clinical Skills

Fourth year undergraduate medical students

Medical training

Competence

Preparedness

UKZN

.

## **ABSTRACT**

### **Background:**

The South-African-Cuban Medical Collaboration (SACMC) programme involves medical training being offered to rural South African (SA) origin students in Cuban facilities with the view of future medical practice in local rural SA settings. The students on the SACMC programme return to South African medical schools to complete their training and clinical practice in their 4<sup>th</sup> academic year. The students experience difficulty in adapting to local clinical demands and integrating their prior knowledge as required at the Nelson R Mandela, School of Medicine, (NRMSM) of the University of KwaZulu-Natal (UKZN) in Durban, South Africa as evidenced from examination board minutes.

### **Aim:**

In an effort to inform educators of the extent to which students' prior clinical training and experiences in Cuba matched the clinical skills taught at the NRMSM, this study investigated the similarity or difference in approach to the curriculum, clinical skills content and perceived competence of the SACMC students to a set of 75 core clinical skills which are deemed essential during training in years 1-3 at the institution.

### **Methods:**

A mixed methodology study used a phenomenological approach to explore the clinical experiences of 11 South-African -Cuban medical collaboration students. Qualitative data collected by means of interviews and a questionnaire were used to determine the curriculum approach and content. A questionnaire generated quantitative data about students' familiarity; exposure and perceived competence (ability to perform independently, with supervision or not at all) on 75 specific skills which are considered a prerequisite to enter the 4<sup>th</sup> academic year at the NRMSM. The skills in 9 major categories, included communication, resuscitation, adult examination, new-born examination, general procedural skills, specimen collection, obstetrics and gynaecology procedures, airway management procedures and radiological examination.

**Findings:**

The didactic, lecture intensive Cuban curriculum with its emphasis on primary health care principles and predominance of ward-based clinical training was found to be vastly different from the problem-based, systematic and practical oriented laboratory-based clinical training offered to local students. The majority of students self-reported a lack of exposure to 35 of the overall 75 identified skills. Most students claimed an inability to independently perform 95% (4 out of 75 skills- able to perform 5%) of clinical skills. The qualitative data revealed that many primary health care skills were neither taught nor practiced by students within the first 5 years of training in Cuba.

**Conclusion:**

This study has highlighted the mismatch between the focus and scope of clinical training offered to students on the South African-Cuban Medical Collaboration programme and those at the NRMSM. In the light of continued collaboration in health education and to ensure that returning students are adequately supported and integrated into the SA clinical setting, it is important that educators work towards improving the alignment of the training programs.

**Keywords:** South-African-Cuban Medical Collaboration (SACMC) programme student, medical education, clinical skills, undergraduate medical students, Nelson R Mandela School of medicine (NRMSM), South African context.

## DECLARATION

I declare that this thesis is my own work and has not been submitted in any form for any other degree or diploma at any university or other institution of tertiary education.

Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

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Dr M.I.Motala

Signature

Date: 16/11/2014

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Dr J. Van Wyk

Signature

Date: 16/11/2014

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## **LIST OF ABBREVIATIONS**

SACMC- South-African-Cuban Medical Collaboration programme.

HPCSA- Health Professions Council of South Africa

UKZN- University of KwaZulu-Natal

NRMSM- Nelson R. Mandela School of Medicine

PBL- Problem Based Learning

SCM- School of Clinical Medicine

MBChB- Bachelor of Medicine and Surgery

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# CHAPTER ONE

## 1.1 Introduction

This chapter introduces the study and provides a broad overview of the reasoning behind conducting a study of this nature. It includes information regarding the need for doctors in rural South Africa, the nature of the South African Cuban Medical Collaboration programme (SACMC), the extent of the involvement of the Nelson R. Mandela School of Medicine (NRMSM) of the University of KwaZulu-Natal (UKZN) with the SACMC programme and clinical skills training at NRMSM.

## 1.2 Shortage of doctors in rural areas

There is a critical shortage of medical doctors to serve the health needs of South Africa. This stems back as far as the apartheid era (Wilson et al, 2009). South Africa's critical shortage of doctors has been estimated as approximately 0.57 doctors for every 1,000 people, compared with an average of two to five doctors for every 1000 people in developed countries (Health Systems Trust, 2013). The World Health Organization estimates that 36 countries throughout Africa face a critical shortage of health personnel (WHO, 2006). This shortage of doctors is even more apparent in rural areas and among rural communities as doctors have a tendency to move toward urban areas post qualification. This is a global problem that poses a serious threat to equitable health care for the whole population irrespective of social class, race or gender. Previous apartheid policies have resulted in great disparity leaving approximately 43% of South Africans living in rural areas, often with greater health related problems, but with access to only 12% of the medical workforce (Wilson et al, 2009). In efforts to redress these inequalities and in trying to improve the health care outcomes of rural and disadvantaged communities, the SA government has entered into various initiatives to increase the health care workforce and address the needs of rural communities, stemming from local studies such as De Vries and Reid (2003) suggesting the likelihood of rural-origin medical students to choose rural careers. The SA government has entered into an intergovernmental agreement with Cuba to assist in the medical training of South African students from rural locations (Blunden, 2008). One of the ways that the South African government is able to incentivise students to study

medicine and then work in rural areas is to provide scholarships while applying conditions to those scholarships. These conditions would be a commitment to work in rural areas or areas of greatest need and by recruiting students from these areas and then encouraging students who qualify to return to help the communities from which they originated. Eyal & Barnighausen, 2012 have shown the effectiveness of strategies to increase doctors in areas of critical shortage by applying conditions to medical school scholarships and how effective this strategy is for increasing the doctors in underserved areas.

### **1.3 South African-Cuban Collaboration Programme**

The collaboration programme started in 1996 with South African provinces recruiting black and disadvantaged high school graduates for medical training in Cuba. The first group of 92 students began in 1996 in Cuba. All students were offered full scholarships with the understanding that they return to practice in the public sector in rural and underserved areas of South Africa for the same amount of time they spent training in Cuba (approximately 5 years) (Reed & Torres, 2008). Students on the programme study in Cuba for the first 5 years of a 7 year programme. They return to South Africa in their 6<sup>th</sup> Cuban academic year to complete their training at one of the 8 local South African medical training facilities. The first year at the Cuban institute involves a premedical training course in the form of a bridging course during which students become proficient in Spanish as the medium of instruction at the Cuban training facilities. Students then spend two years studying the basic sciences followed by three years of clinical sciences at one of three Cuban medical training facilities which are involved in the SA-Cuban exchange programme. Students return in their Cuban 6<sup>th</sup> year to one of eight South African medical schools to complete their clinical training. It involves an eighteen month period during which time they rotate through the clinical departments before taking a South African exit examination and graduating from the local SA medical school. (Reed & Torres, 2008) This is done to allow the students to integrate back into the South African health care system.

### **1.4 Context of the study and NRMSM role in the SACMC Programme**

Students on the SACMC programme scholarship who return to the Nelson R. Mandela School of Medicine of the University of KwaZulu Natal (UKZN), join the local fourth year class in the second semester of their training. They experience a period of between

4-to 6 months adjusting to the South African clinical setting without having to participate in any of the examinations. The students from the collaboration programme join the local 5<sup>th</sup> year class at the start of the new academic year. This entails being grouped for the rest for clinical rotations, attending ward rounds, clerking patients, keeping logbooks and completing the block assessments and clinical examinations with their peers who have completed all the components of their medical training attached to the teaching and medical training facilities and platforms of the UKZN. This allows the students to become familiar with the South African health care system, and to complete their training in accordance with the requirements needed for practicing as an intern in South Africa (Jaschinski & De Villiers, 2008).

Interactions with students who join the South African group and observations as clinical coordinator to the 4<sup>th</sup> year suggests that the students find the re-integration process challenging. Their struggles in adjusting and passing the local examinations are also evidenced by the academic results of the SACM programme students over the last decade (Ngidi, 2013). The SACMC students have demonstrated specific difficulty in passing the clinical examinations in the 5<sup>th</sup> year of medical study. While some repeat a number of the clinical blocks through which they had rotated, others often have had to repeat the whole year (Ngidi, 2013).

In an attempt to assist the collaboration students' academic transition, the school instituted a formal programme in 2012 to supplement their academic experiences. Local academics, like the researcher who are involved in the training of the students, do not always have an adequate understanding of the students' prior clinical experience in Cuba to help facilitate their transition. The Joint Academic meeting of South African and Cuban Deans of medical health faculties was held in Pretoria on July 04 2013. It appears that the South-African-Cuban medical training collaboration programme is due to continue for at least another decade and beyond with an increased intake of students to meet the growing health care demands of local rural communities and therefore in fact an increased intake of students from South Africa will result in an increasing intake of students in the fourth year of medicine at UKZN (Joint Academic Meeting, 2013). There is thus much need to ensure that the students are adequately supported and properly integrated for the tasks that lie ahead. It appears that the research and subsequent needed intervention is therefore essential to ensure that

returning students will be allocated appropriate time and resources to support them in their clinical transition process.

The successful design of any such programme however, rests on an accurate diagnosis of the academic needs of the students. In the absence of local and international research comparing the design and outcomes of the programmes on which the students study, this study was conceived to understand and explore the nature and scope of the clinical training of the SACMC students. It is envisaged that such understanding will greatly enhance the design and quality of support and interventions programme to the students who need to integrate their prior learning upon joining the programme at the NRMSM system.

### **1.5 Clinical skills training at NRMSM**

Our current medical curriculum at UKZN consists of 6 years of study. Each year of study from year 1 to year 3 has a set of clinical as well as procedural skills that are linked to the various modules. Clinical skills are taught over the three years in increasing levels of complexity and with repetition.

These include skills such as communication with a patient, basic airway management, as well as physical examination skills. First the clinical skills are demonstrated and taught in the clinical skills laboratory on the second floor of the medical school. Physical examination techniques are demonstrated on simulated patients and on plastic models and mannequins. Procedural skills like intravenous cannulation are demonstrated on models and communication skills are demonstrated using simulated patients, i.e. people who have been trained to act like patients and are therefore able to give the relevant responses to questions.

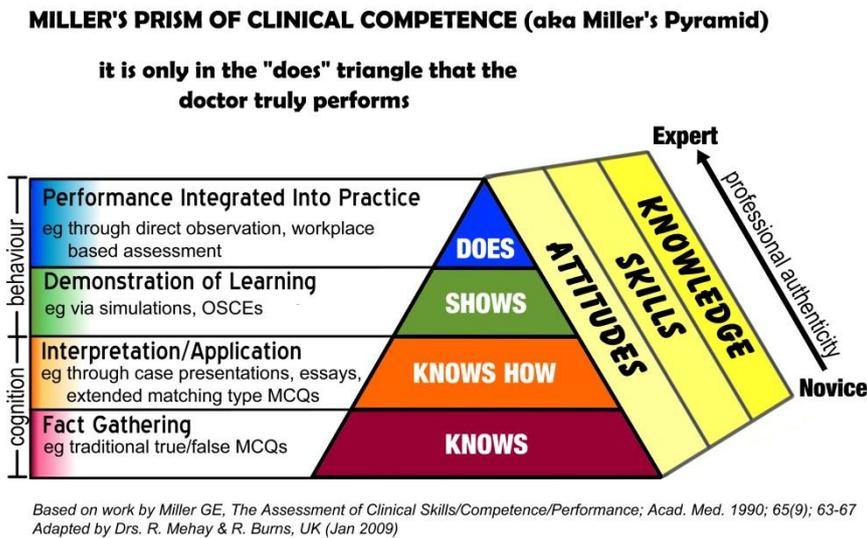
In the first three years of the current MBCHB degree, the students demonstrate an integration of the theory and the practice of a skill. An example from a module on the respiratory system, the students will learn communication skills related to the respiratory system, examination skills related to respiratory system and procedural skills such as how to nebulize an asthmatic patient. The other aspect of the UKZN MBCHB degree is that repetition of some skills occurs within the three years for example basic resuscitation skills and therefore allows the student to gradually develop

their expertise in clinical skills. These clinical and procedural skills are considered vital and are assessed through logbook examinations as well as objective structured clinical examinations during the course of the first three years of the MBCHB program. Once a student has entered the fourth year of study, these basic skills are considered to be part of their core knowledge (Matthews, 2012).

## **1.6 Understanding clinical skills education**

A framework which is being used to understand and explain the teaching and assessment of clinical skills to enable competent practice is the one proposed by George Miller (Miller, 1990). The framework has been adapted by Mehay and Burns (2009) into a prism constituting four levels to assess competence. The first two levels of the prism is strongly embedded in cognition and the last two in behavior. While the adapted model allows for the monitoring of knowledge, skills and or professional behaviour , the application of the model to this thesis is primarily focussed on the skills domain. At the base of the prism, (refer to figure 1 below), the student has to demonstrate the necessary knowledge in relation to a skill. The second level requires the student to demonstrate their acquisition of knowledge of procedures and skills, often in simulated and skills laboratory settings. This aspect generally correlates to basic training in premedical skills laboratories where theoretical and practical skills are demonstrated and assessed. At the third level, a student should demonstrate an ability to perform a procedure independently. This level of competence would typically be expected and monitored in the supervised clinical setting. The ultimate aim of the training, as indicated at the 4<sup>th</sup> level, is to develop and enable learners to use their knowledge and skills appropriately for independent action and practice. This is also the aim of the clinical training component at the NRMSM i.e. to ensure that students as health care professionals can eventually demonstrate (in doing) an ability to safely practice as independent health care practitioners. Clinical experience and feedback in supervised settings will greatly assist students to acquire, develop and improve their ultimate clinical practice (Miller, 1990). This study has not included a formal assessment of the students' clinical skills ability but focus on students ' perceived competence in the clinical skills arena.

Figure 1: Miller's Prism of Clinical Competence (adapted from Miller's (1990) pyramid) (Mehay & Burns, 2009)



This study also draws on the educational principle of constructive alignment (Biggs, 1999), and its application to curriculum in Higher Education institutions. In essence the theory relates to the necessity for modular assessment activities to be clearly aligned to the expected learning outcomes; all the planned teaching and learning activities of a course reflect the intentions of the course or qualification. In a well-structured system, students should not only be informed of how these will improve their knowledge and competence but they should also perceive the relevance of activities and placements in the advancement of their knowledge, practice and experience assessment tasks as relevant in ensuring the attainment of the stipulated outcomes (Biggs, 1999).

The premise of the SACMC program thus rests on the notion of preparing students through a Cuban based curriculum for practice in South African primary health care settings. Students who complete the lion's share of their training in Cuba return to SA to complete their training and enter into internship. It is therefore reasonable to attempt to understand what prior learning and experience, especially in relation to clinical skills, one can assume for this group of students when they enter the MBChB programme at the NRMSM at this advanced stage of the curriculum.

## **1.7 Problem statement**

The UKZN has been involved with the Cuban exchange program since its inception a decade ago. The SACMC students have been found to have considerable difficulty in passing their clinical examinations in the 5<sup>th</sup> year of medical study at the local institution. Some of the students need to repeat a number of their clinical blocks and others have had to repeat the whole year (Ngidi, 2013).

In 2012, the NRMSM instituted a formal supplementary academic support program for the SACMC students. However no published research has been done locally at UKZN to explore and understand the nature of the clinical difficulties that the SACMC students face and whether offering academic support is adequate to ensure their success in the final year at the NRMSM. It is unknown whether the collaboration students are being adequately prepared to practice medicine in South Africa or not. Local academics teaching these students in the medical school do not know much about or understand what the students' clinical experience has been in Cuba, or what curriculum content has been taught to the students in Cuba compared to what local students are studying and how prepared clinically these students are to embark on their final year of training in South Africa.

## **1.8 Aims and Benefits of the Study**

This study was conducted to determine what clinical skills training the students received while in the Cuban setting and how the content and clinical practice during training compared in the different settings. The study aimed to determine the extent to which students' prior clinical experiences and skills training facilitated their perceived preparedness in the clinical arena. If students are not adequately exposed to procedures which are deemed essential in this context, then the identification of such will help clinical staff to tailor the support which is offered to them. This will help them to succeed in qualifying as doctors who are on a par with local students and ultimately ensure their long term success as medical professionals in South Africa. This study will inform future support and stimulate subsequent research on the success of this exchange

programme. Research in this arena would benefit the SACMC students, lecturers, our institution and patients in this region.

## **1.9 Research questions**

1. What curricular approach and clinical skills content were the SACMC students exposed to during their Cuban based training in medicine? (Student perceptions of curricular approach and clinical skills content)
2. What clinical skills training did the students receive in the Cuban setting and how does the training compare to that offered at the UKZN?
3. To what extent has students' prior clinical experiences and skills training in Cuba facilitated their clinical preparedness in the local clinical setting?

## **1.10 Interpretation of competence, clinical preparedness and performance**

Given the fact that the Cuban trained students join the UKZN curriculum and are expected to participate from the middle of their 4<sup>th</sup> year without having to conduct a formal assessment, this study was based on the understanding that all students entering the 4<sup>th</sup> year would have attained the prerequisite knowledge and clinical skills which are taught and assessed in the preceding 3 years. All students who trained at the UKZN would have demonstrated mastery of knowledge and skills components in each semester of their academic year of their studies.

Deliberations at exam board meetings have highlighted the difficulty of Cuban trained students especially in passing the clinical components of the 5<sup>th</sup> year assessments. The reason for this has been relatively unknown and this study is an attempt to understand and possibly explain the educational phenomenon.

The words competence, performance and clinical preparedness have been used in an inconsistent and interchangeable manner in literature. For example the word clinical preparedness is used in several articles in the literature using preparedness and competence interchangeably, i.e. Blumenthal et al 2001, Weismann et al. 2005, Buss et al. 1998 and Grad et al 2001.

Some authors have distinguished between the assessment of performance and competence (Epstein and Hundert 2002; Ruedy 2007), however, Dreyfus and Dreyfus (1980) have described competence as simply a point on a spectrum of improving performance. Their spectrum identified the practitioners' skills that range from novice to advanced beginner to competence to proficiency and then finally expertise. For Epstein and Hundert (2002: 227), competence refers to "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotion, values and reflection in daily practice for the benefit of the individual and community being served." Their definition is fairly comprehensive and competence is reinforced as being "developmental, impermanent and context –dependent" (2002:227). Ten Cate et al (2010) refer to performance of an individual as an interplay with the practice setting in which the exposure occurs in which s/he has to use a combination of attitudes, skills and knowledge for optimum performance.

The word prepare according to the Oxford English dictionary (1989), means to make (something) ready for use or consideration. This is used in the context of the medical curriculum which is designed to prepare a graduate for practice. It is assumed that the intention of the Cuban medical training programme is also to prepare a student to complete the last 18 months of clinical training in South Africa prior to graduation to allow them to function as a qualified medical practitioner. This study is exploring whether these returning students perceive themselves as prepared and competent in performing clinical skills upon entry to this university.

Student perceptions can serve as a useful indicator of the quality of their educational experiences (Blumenthal et al., 2002:1034). Yusuf and colleagues warn that student perceptions about their clinical competence should be regarded as a limiting factor since self-perceived competence sometimes falls short of expected competence (Yusuf et al, 2010). It is therefore acknowledged that self-evaluation is a complex process which cannot be perceived as an objective process (Barnsley et al (2004).

Thus, for the purpose of this study the words competence, performance and preparedness all pertain to the acquisition of knowledge and ability to perform clinical skills at the level of a medical student entering the 4<sup>th</sup> year of medicine at UKZN.

## **1.11 Limitations**

The data is based on the perceptions of the students and not on their actual competence as measured with an objective assessment instrument. The questionnaires were administered to the students after a week-long exposure to an orientation- intervention program which included an overview to clinical skills from the UKZN curriculum perspective. It is therefore possible that students' awareness of the skills might have impacted on their confidence and perception of performance. The results from this study are not generalizable to other institutions. The study was based on a relatively small, but purposive sample in the context of UKZN. Other medical educators are advised to compare their programmes and settings to ours to assess how applicable the findings would be to their settings.

## **1.12 Conclusion**

This chapter served to introduce the study and offered a brief rationale for the significance of the educational study involving the SACMC students. This introduction provided an overview of the various components of the study. The context is developed with the background information and the rationale for the study, aims and benefits as well as the key research questions are detailed here. This dissertation has been organised into six main chapters and in the paragraphs below is an overview of what the other chapters include:

Chapter Two details a literature review which is organised into five broad categories which include information relevant to the Cuban health care environment and international care, the history of the South African Cuban collaboration program in terms of meetings and agreements, the curriculum in Cuba and the curriculum in SA and the SACMC students and the SA health care environment. Collectively all this information provides the context from which this study was conceptualised.

Chapter Three explains the conceptual framework and describes all the theories that have been used to define and explain various phenomena in this study. The framework includes experiential learning theory, prior knowledge, transfer of learning theories, alignment theory and Miller's framework of clinical competence.

Chapter Four includes the research methodology of the study and describes in detail the methods that have been used for the study. An explanation of data collection, sampling, data analysis procedures and limitations of the study are specified.

Chapter Five: This chapter discusses the data findings and is dedicated to the presentation and analysis of the qualitative and quantitative data.

Chapter Six: The final chapter of this dissertation is a discussion of the findings and includes recommendations and draws conclusions from this study as they pertained to the results of the research. Attention was given to addressing the implications of this research for relevant audiences, as well as providing suggestions for future research on the topic of interest in this study.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This literature review provides a background to the study and highlights relevant issues pertaining to the study. The review is organised around five broad categories.

This chapter includes information relevant to:

- The Cuban health care environment and international health care
- The SACMC program in terms of meetings and agreements
- The Cuban curriculum
- The UKZN curriculum , philosophy, clinical skills teaching and learning outcomes
- The SACMC students and the South African health care environment.

Collectively this information provides the scope of the study, highlights the relevant literature published in this area and illuminates areas of relative paucity and lack of published literature regarding the SACMC programme.

### **2.2 Cuban health care environment and International health care**

Cuba as a country has been involved in the international health care arena for the last 4 decades (Blunden, 2008). Their contribution has been to provide Cuban trained doctors to work on the African continent. Countries include South Africa, Eritrea, Uganda, Ghana, and Guinea Bissau (Blunden, 2008). In addition to this, Cuban humanitarian aid has extended to Africa and Latin America and involved more than 15 000 Cuban physicians (Blunden, 2008).

Cuba's medical assistance and involvement with various countries has impacted on the health policy in the various regions and Cuba's collaboration also includes the training of doctors from a region's own population to deal with local health care crises. In that regard the Cuban government began collaborating with various countries to establish a full medical education training programme in Cuba with the condition that trained participants return to their countries of origin to work in areas of greatest needs (De Vos & Bonet, 2004).

The formation of the Latin American School of Medicine (ELAM) was founded in Havana in 1998 and has been used for the purpose of training of African and international students (Blunden, 2008). Other universities in Cuba that are involved with the training of international medical students include Villa Clara, Cienfuegos and Sancti Spiritus (Joint Academic Meeting, 2013).

On the 11<sup>th</sup> of May 1994 Cuba and South Africa established full diplomatic relations. It included the posting of an ambassador to Cuba. President Mandela had a vision to foster trade, economic and cultural collaboration with Cuba that would be beneficial to both countries (Department of foreign affairs, 2013). The South African government therefore established a physician training agreement with Cuba because the humanitarian and solidarity principles promoted in Cuban medical education were aligned to South Africa's new post-apartheid constitution (Quintana et al, 2012). South African provinces recruited black and disadvantaged high school graduates for medical training in Cuba. In 1996, the first group of 92 SACMC students started the programme in Cuba (Asante et al, 2012).

Health has been a priority in Cuba and this is evidenced in good quality services being offered at no charge at the point of delivery to communities. There are also high utilization rates of medical services (De Vos et al, 2005). Cuba unlike most developing countries like South Africa is in a good position to offer quality and accessible health care to all of its citizens. The approach to health care in Cuba changed after the 1959 revolution and is based on a model of preventative medicine rather than curative medicine (Blunden, 2008). In South Africa the privatization of medical care and medical-aid schemes affects health care delivery and access allowing more affluent citizens greater access and better quality health care. In Cuba, however, health services remain free to its citizens at the various points of delivery and the government remains the main regulator of health care (De Vos et al, 2005).

The Cuban health care system includes regionalized hospital services and professional training. There are very progressive public health initiatives and epidemiologic

surveillance mechanisms. The Cuban population enjoy universal access to health services without substantial barriers related to race and social class (Waitzkin, 1997). Cuba's accomplishments in family medicine include several developments which are highly important to primary health care. These innovations involve low-technology systems such as family medicine based in neighbourhoods as the focus of primary care. Family medicine physicians live in the communities that they serve, often within the same building that has their private consultation rooms. Family medicine physicians provide primary care services for patients who live in the neighbourhood of the practice. Every family physician sees patients in their area at least twice a year. The physician does extensive record keeping of the medical conditions, treatment and preventive measures for all patients in their neighbourhood (Waitzkin, 1997).

Health education in Cuba begins in the classroom and continues throughout life. Cubans have been described as the most “medically-literate” population worldwide (Briggs 2011:1041). Health professionals and journalists have showed that the level of reception of health knowledge is a key characteristic of the Cuban general population. Culturally South Africans and Cubans are dissimilar, while Cubans read extensively and tend to be demanding in the arena of health issues, most of South Africa’s disadvantaged population display a lack of literacy. In South Africa, health education is not a priority and poor access to resources and high unemployment remain key issues.

### **2.3 The SACMC program in terms of meetings and agreements**

In October 2012, the third joint, inter- university academic meeting was held in Cuba at the University of Medical Sciences of Havana. All 8 South African universities were represented there as well as representatives of the Health Professional Council of South Africa.

Two Inter-university workshops were conducted in Havana and all these various stakeholders, South African and Cuban, recorded their agreement of the following:

- The collaboration program for the training of SA doctors in Cuba is a symbol of the strong relationship between the governments and peoples of Cuba and South Africa.

- The medical training program plays an important role in helping South Africa deal with its human resource requirements in health and there will be an increase in the enrolment in the coming years.
- The objectives and contents of the training in both countries have more aspects in common than differences.
- There are variations in training approaches, but they can be solved by implementing identified strategies that would bring these aspects closer.
- It is important to further develop the coordination and implementation of the program in South Africa and Cuba.

(Joint Academic Meeting, 2013).

In his address at the joint academic meeting, Dr Kaya Mfenyana<sup>1</sup>, addressed the training received in Cuba and the expectations required to practice medicine in SA. He said that curative medicine is prevalent in SA and the services prioritised are internal medicine, surgery, obstetrics and gynaecology, paediatrics, family medicine and psychiatry. He acknowledged that this marked the main difference from the Cuban medical training programme, which prioritises primary health care and preventative medicine. Of note in this context is the address of Dr Banos<sup>2</sup>, where he referred to differences in skills development and clinical practice between South Africa and Cuba, clarifying that a graduate from Cuban universities is a basic general practitioner. He explained further that students from various nationalities studied at Cuban universities and it was not feasible to establish a curriculum for each nationality (Joint Academic Meeting, 2013).

## **2.4 Cuban Curriculum**

This is an overview of the literature review of the curriculum for the Cuban medical training collaboration program that includes South Africans as well as students from all over the world. Most students who are successful as applicants on the SACMC programme are predominantly from poor, disadvantaged and rural backgrounds. They

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<sup>1</sup> The Dean of the medical faculty of Walter Sisulu University, Eastern Cape

<sup>2</sup> The rector of the University Of Medical Sciences Of Cienfuegos

have been unable to afford tertiary education and are members of indigenous communities. The ages of the students usually range between the ages of 18 and 26 years. The students need to be in good health and have no criminal past. Students are also selected based on their willingness, to practise medicine in underserved communities within their countries of origin (Huish, 2008).

Students who are accepted on the SACMC program undergo an initial pre-medical module, which includes basic science courses like chemistry, biology, math, physics as well as a course in communicating in the Spanish language. The medical program starts every September and is offered over 12 semesters. Students initially study at the ELAM campus for the first two years before completing their studies at one of Cuba's twenty-one other medical schools either in Havana or other cities. In the first two years of medicine, basic sciences are taught and in the remaining years, clinical subjects are taught. This commences in the fifth semester of the programme where students begin to clerk patients on the hospital wards where they have been assigned (Huish, 2008).

The cornerstone of the Cuban curriculum is the two volume set by Alvarez Sintes, '*Temas de Medicina General Integral*' (*Themes in General Integrated Medicine*). The emphasis of the Cuban curriculum is on the social and environmental determinants of health, as well as epidemiology. The Cuban medical training model emphasizes primary healthcare and community medicine (Huish, 2008).

## **2.5 The UKZN curriculum: Philosophy, clinical skills teaching and learning outcomes**

There is a move globally towards competency-based curricula and the UKZN MBChB programme is directed towards meeting the Core Competencies outlined by the HPCSA which has adopted the CanMEDS competencies of: healthcare practitioner, scholar, professional, health advocate, leader/manager, collaborator and communicator. The CanMEDS Framework is based on empirical research done by the Royal College of Canada Fellows and volunteers and was approved by the Royal College Governing Council in 1996 (Royal College of Canada, 2013).

Outcomes-based education is a performance-based approach to medical education. The emphasis is on the type of doctor that will be produced and the learning outcomes are

clearly indicated to ensure that educational outcomes are understood and thereby achieved. The educational outcomes therefore determine to a greater extent the curriculum content, the assessment strategies and provide a means for evaluation of the curriculum (Harden, Sowden and Dunn, 1984).

The current MBChB programme at UKZN is meeting a national priority in increasing the number of people trained as doctors, just as the intention behind the Cuban collaboration program. It serves to address the shortage of medically qualified personnel and therefore medical students are trained in a way that meets the requirements of the South African medical context, with attention being given to graduate competencies which are specific to local contexts, for example an emphasis on learning about common health-related conditions in KwaZulu-Natal such as infectious diseases like Tuberculosis and AIDS or the Acquired Immune Deficiency Syndrome.

The MBChB programme intention is to train medical practitioners to fulfil the requirements of the HPCSA and ultimately be equipped with the skills required to function in primary care clinics, community centres, and rural, district, regional, tertiary hospitals, private practice, private hospitals and academic institutions (UKZN Curriculum, 2012).

The main educational philosophy underlining the UKZN MBChB programme is based on a principle of self-directed experiential learning with a combination of problem based learning, didactic teaching, self-directed learning and spirally based learning with repetition of learning experiences and content (Curriculum documents UKZN, 2012). The emphasis is on teaching and learning integration within the entire MBChB curriculum with respect to content and processes.

Six educational strategies have been identified in medical school curricula. The abbreviation SPICES depicts each strategy each of which can be represented as a spectrum or continuum. These include the following:

- S- student-centered/teacher-centered,
- P- problem-based/information-gathering
- I- integrated/discipline-based,
- C- community-based/hospital-based
- E- elective/uniform

- S-systematic/apprenticeship-based

(Harden, Sowden and Dunn, 1984).

Problem based learning, is one of the educational strategies above deemed important by Harden, Sowden and Dunn, (1984), and was adopted by UKZN in 2001. It was implemented as a 5 year integrated PBL curriculum and replaced a traditional 6 year lecture based traditional didactic curriculum. This integrated PBL curriculum is characterised by being student-centred and patient-oriented (Van Wyk & Madiba, 2006).

In the MBChB programme for the first three years, the teaching of clinical skills forms part of the core of each module. The teaching of the theory which informs clinical skills is presented in a lecture based setting first, so that students have the theoretical knowledge and understand the reasons why a procedure or skill is being taught to them. Students thereafter perform the practical component, where the skill is demonstrated or performed in the clinical skills laboratory. Students are taught in a safe, simulated environment where they are able to see the skill demonstrated and then practice the skill either individually or in groups.

Teaching in the clinical skills laboratory is first performed on full scale mannequins and human patients in the form of simulated patients. Simulation is an educational technique that facilitates learning by reproducing a clinical experience or a clinical event (Maran et al, 2003). Simulated learning environments may vary from low fidelity to high fidelity models. Fidelity is the extent to which the appearance and behaviour of the simulator / simulation resembles the real situation (Farmer, 1999). The level of fidelity required depends on the type of task and stage of training and influences skills transfer. Simulated patients are mainly used at the NRMSM for the teaching of communication, interpersonal skills, and clinical examination skills. The use of full scale mannequins and part or partial task trainers versus real patients depends on the type of clinical skill being taught, the complexity of the skill and the availability of the models or real simulated patients.

Five basic categories of clinical skills are being taught in each of the academic years as indicated in table 1. The motivations for the competencies are also included.

**Table 1: Clinical Skills Categories: Year one to three**

1. Communication skills	Generally taught from first year. Essential because learners need to become competent at taking a patient's history.
2. Resuscitation skills	Generally taught from first year to third year. Initially starts with basic emergency skills and then more advanced skills are taught. Essential because learners need to become competent in basic and advanced resuscitation.
3. Examination Skills	Generally taught from second year. These are basic examinations skills for each system that the students are exposed to doing them with normal simulated patients. It allows the students to become familiar in being able to firstly examine a patient with normal systems and then allows them to start noticing abnormalities in the third year when they are exposed to real patients. Essential because learners need to become competent at examining a patient.
4. Procedural skills (general, airway, obstetrics and gynaecology and specimen collection)	Generally taught from second year. Essential because learners need to become competent at these basic procedural skills that students must be able to understand and demonstrate.
5. Radiological examination	Generally taught from second year. Essential for students to develop an approach for viewing radiographs and the ability to detect minor abnormalities during the second and third years.

The achievement of learning outcomes for medical education should be based on formative, informative and transformative learning and on interdependence and integration within medical education, (Frenk et al, 2010), and this is achieved at NRMSM by revisiting of topics in a spiral curriculum and a combination of problem based learning and didactic teaching.

The learning outcomes for the current UKZN MBChB programme at the time of the study are based on research from literature on medical education and teaching and learning which are done to ensure that there is alignment between the curriculum and the learning outcomes or goals (UKZN Curriculum, 2012).

## **2.6 The SACMC students and the South African health care environment.**

There are relatively few articles on the challenges that students face on their return to South African medical schools. In a report by Reed and Torres (2008) after speaking to students of the SACMC programme who were working in rural hospitals reported that Cuban-trained graduates faced racism and prejudice at some South African medical schools when they returned home. The students also had to learn additional country – specific skills and medical English to cope on their return to South Africa (Reed 2008: 51). In an interview with a former SACMC student, Dr Sibandle reported the need to “reintegrate into the South African health system, and get to know the diseases we would face daily...In Cuba, it was a different setting; the AIDS patients we saw there looked normal” (Reed 2008: 51).

The population of South Africa is approximately 51 million (Census SA, 2011). The majority of the population are dependent on the public sector for their health care. Since the end of apartheid in 1994, the government had embarked on a complete restructuring of the health care system which has been underpinned by important legislation. This has led to some successful legislation such as:

- free primary health care for all
- an essential drugs programme
- allowing women a choice on termination of pregnancy
- anti-tobacco legislation (Harrison, 2009).

However there have been some significant failures of legislation not successfully implemented over the last decade which include the following:

- limited effort to curtail HIV/AIDS
- emergence of MDR TB and XDR TB
- inadequate attention to the epidemic of alcohol abuse
- persistently skewed allocation of resources between the public and private sectors (Harrison, 2009).

## **2.7 Conclusion**

This chapter detailed a literature review which was organised into five broad categories which included information relevant to the Cuban health care environment and international care, the history of the South African Cuban collaboration program in terms of meetings and agreements, the curriculum in Cuba and the SACMC students and the SA health care environment. It highlighted the differences between the South African and Cuban health care environments, curricular needs and differences of medical students training in Cuba with the ultimate aim of actually practicing medicine in South Africa. Collectively this information provided the context for this study. The next chapter explains the conceptual framework and describes a selection of theories that have been used to define and explain various phenomena in this study.

# CHAPTER THREE: THE CONCEPTUAL FRAMEWORK

## 3.1 Introduction

The previous chapter detailed a literature review of five broad categories and provided the context for the study. It also highlighted differences between the SA and Cuban health care environments, curricular differences and differing health care needs. In this chapter I will draw on theories which may explain the phenomenon being studied. The conceptual framework will be discussed in relation to each of the research questions namely:

1. What curricular approach and clinical skills content were the SACMC students exposed to during their Cuban based training in medicine? (student perceptions of curricular approach and clinical skills content)
2. What clinical skills training did the students receive in the Cuban setting and how does the training compare to that offered at the UKZN?
3. To what extent has students' prior clinical experiences and skills training in Cuba facilitated their clinical preparedness in the local clinical setting?

The conceptual framework which underpins this study contains a complex system of beliefs, concepts, assumptions, expectations, and theories that support and informed this research. (Miles & Huberman, 1994). The conceptual framework serves as a context of meaning and facilitates an interpretation of the data and findings. The framework which informed the exploration of the research questions is underpinned by the following theories:

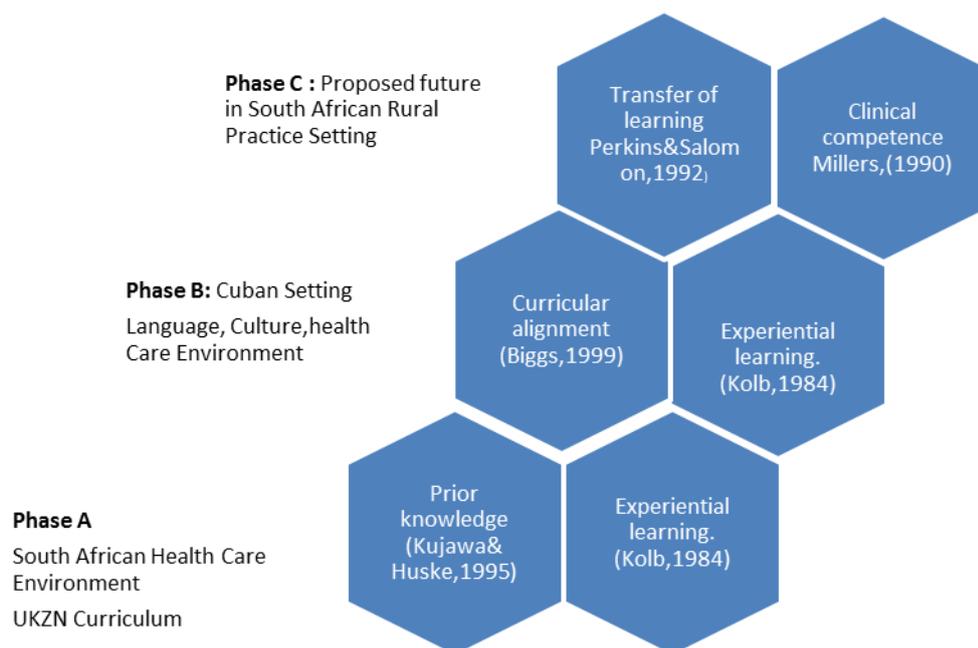
Table 2: A summary of the conceptual frameworks of the study

<b>Research Question</b>	<b>Conceptual framework</b>
1. What curricular approach and clinical skills content were the SACMC students exposed to during their Cuban based training in medicine? (student perceptions of curricular approach and clinical skills content)	Kolb Experiential learning (Kolb, 1984). Prior knowledge (Kujawa and Huske, 1995) and Biggs' (1999) alignment theory

2. What clinical skills training did the students receive in the Cuban setting and how does the training compare to that offered at the UKZN?	Miller's clinical competence Theory (1990) and experiential learning
3. To what extent has students' prior clinical experiences and skills training in Cuba facilitated their clinical preparedness in the local clinical setting??	Biggs' alignment theories and Transfer theories ( Perkins and Salomon, 1992)

The figure below provides an overview of the different phases of the SACMC students' progress after completion of secondary training to re-integration in their clinical 4<sup>th</sup> year at the NRMSM.

Figure 2: Conceptual frameworks underpinning the study



### 3.2 Impact of Prior knowledge on learning

Prior knowledge is the knowledge, skills or ability that students bring to the learning environment prior to teaching (Jonassen & Grabowski, 1993). This form of knowledge acts as a lens through which the student views, assimilates or acquires new information.

Prior knowledge considers who students are, based on what they have learned in daily life and by drawing on their academic experiences.

Students' learning is believed to be more effective when prior knowledge of a content area and concepts in that field have particular meaning to them in terms of background or culture. Teachers' ability to link new information to students' prior knowledge aids in activating curiosity and interest which results in a more enriching and purposeful experience ( Kujawa & Huske,1995).

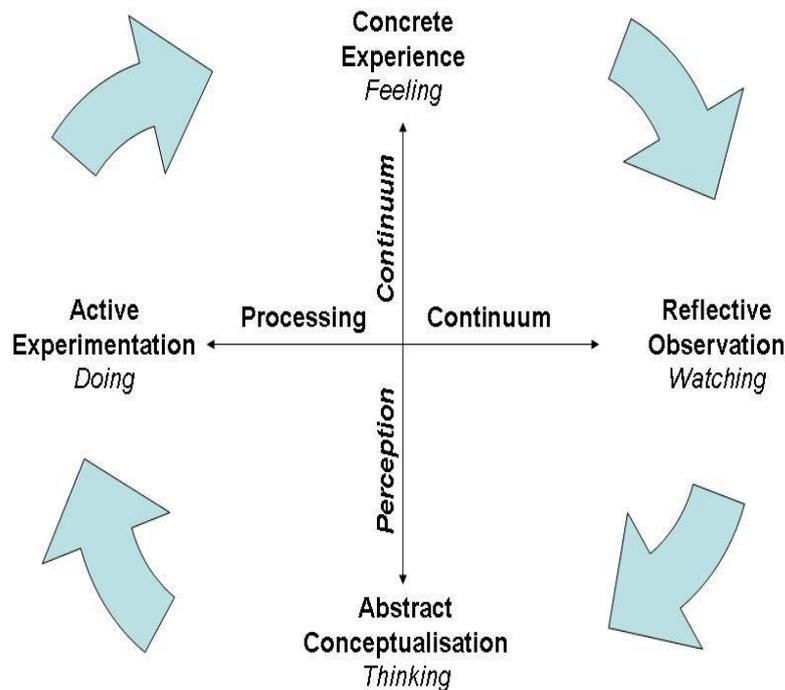
In this study prior knowledge is believed to be important because the Cuban collaboration students enter the SACMC programme having completed their secondary schooling experience at a local school (Refer to Phase A on Figure 2) where the medium of instruction was either a local indigenous language or English. This phase is then followed by entry into tertiary education (Phase B; Figure 2) where the learning experience in Cuba occurs though the medium of Spanish. It is anticipated the prior knowledge before entering the SACMCP and the linkages created with new information on the Cuban curriculum will be critical for the enhancement of the students' interest, curiosity and further learning. The importance of prior knowledge in the learning contexts has been well described by Ausbel, 1978 (cited in Ausbel et al, 1978: Preface) who asserted that... "If I had to reduce all of educational psychology to just one principle, I would say this: the most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly." Research in the field of neurobiology has advanced our understanding for learning and the possible implication for teaching. In this regard Gravet & Geysler (2004:37) assert that prior knowledge as related to one's life experience is likely to be concrete. Teachers should thus start with the concrete experience and then develop concepts and principles from specific examples during teaching. With regard to Phase C on figure 2, the ultimate goal of the SACMC programme is the doctor serving in the rural areas competently and being able to transfer his/her knowledge and skills from the urban to the rural context.

### **3.3 Experiential Learning**

Kolb's (1984) "Experiential learning theory" is a well-known theory in education. Kolb defines experiential learning as *"the process whereby knowledge is created through the*

*transformation of experience*". Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984: 41).As illustrated in figure 3 below:

Figure 3: Experiential Learning Cycle (Kolb, 1984:41)



The process is cyclical where the experience of a student (1), is followed by a time and opportunity for reflection (2). The student is then engaged to contemplate, conceptualise and draw conclusions, (3) about his/her experiences and observations which should ultimately lead to future application and new knowledge (4)

Experiential learning theory draws on the work of many distinguished academics like John Dewey, Jean Piaget, Carl Jung and many others.

The experiential learning theory is built on the following six propositions (Kolb 2005:194);

1. Learning is a process of creating knowledge
2. Learning involves re-learning

3. Learning requires the resolution of conflicts
4. The learning process requires adaptation to the world
5. Learning results from interactions between a person and the environment
6. All experiences offer a source of learning and development.

In a model that had been developed from research on work-based learning, Boud and colleagues identified three stages of reflection associated with experiential learning activities (Boud, Keogh and Walker, 1985; Boud and Walker, 1991):

- Preparation for the event where the focus is on the learner and the learning context and equipping the student with the skills and strategies for reflection in action. It involves preparing the student for what the event has to offer.
- Reflection during the event with a focus on noticing and intervening and helping the student to engage with the learning experience to notice and intervene to promote his/her own learning.
- Subsequent reflection after the event (Bould & Walker, 1991).

The value of this model lies in its ability to help students process their experiences and consciously extract learning outcomes from these experiences.

### **3.4 Transfer of learning theories**

Transfer in education and learning theory is central to formal education as it aspires for the transference of knowledge. As a basic premise of education transfer would have occurred if a person can display learning which occurred in one setting at a later stage. In medical programmes transfer usually requires that students demonstrate understanding and an ability to perform clinical skills.

Transfer of learning can be defined as the effective application by students of the knowledge and skills gained as a result of attending an educational program. This transferring of learning occurs when learning in one context or with one set of materials impacts on performance in another context or with other related materials. Transfer of learning occurs whenever prior learned knowledge and skills affect the way in which new knowledge and skills are learned and performed (Cormier & Hagman, 1987). The

transfer of learning (transfer of training) is a key concept in adult theories of learning, because most education and training instruction aspires to transfer this knowledge to "real world" situations. The context of learning usually differs somewhat from the actual context of application; thus the end goals of education and training are not achieved unless this transfer takes place (Cormier & Hagman, 1987).

Evidence however suggests that the greatly desired and hoped for transfer from learning experiences does not always occur (Perkins & Salomon, 1992). Therefore, the requirements and optimal conditions for transfer of knowledge are critical to successful learning in medical education.

Learning transfer occurs when learning in one context improves or diminishes a related performance in another context. Transfer is defined as near transfer i.e. when context and performances are closely related. Transfer under conditions where contexts and performances are quite different would typically be described as far transfer (Perkins & Salomon, 1992). Transfer can also be categorised as positive which occurs when learning in one context improves the learners' performance in a different context or negative when learning in one context impacts negatively on the learners' performance in another context.

The SACMC students are required to learn medicine in Cuba and practice medicine in South Africa. The assessments and examinations that these students undergo in South Africa have indicated that the acquisition and transfer by the students of their clinical skills knowledge and proficiency has not occurred optimally.

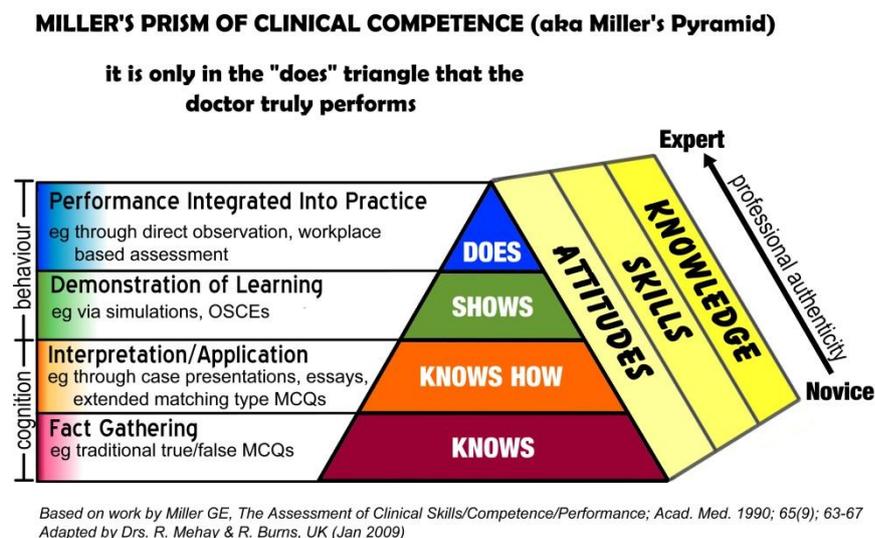
### **3.5 Miller's Prism of Clinical Competence**

Finally the competence of the students at performing clinical skills such as the taking of a relevant history from a patient and being able to examine a patient can be illustrated in the light of Miller's (1990) pyramid of competence for the medical sector. This was adapted to a prism of clinical competence by Mehay and Burns (2009). Assessment within the MBChB program is complex and the student is expected to demonstrate differing types of learning. In the first three years, the students are expected to learn clinical skills and be able to demonstrate their knowledge. The ability

to be competent at performing clinical skills is vital to the success of the students at UKZN and it is critical to success as a clinician in their chosen long term careers. Miller's prism differentiates between competences by referring to what students can do under perfect conditions while performance, however, indicates how people actually behave in real life situations.

This model, as shown in Figure 1, starts with the assessment of cognition, dealing with knowledge, knows (theoretical knowledge), then knows how (competence), and followed with the assessment of competence under controlled conditions (shows how) and then ends with an assessment of competence in practice or the assessment of performance (does).

Figure 1: Miller's Prism of Clinical Competence (adapted from Miller's (1990) pyramid) (Mehay&Burns,2009)



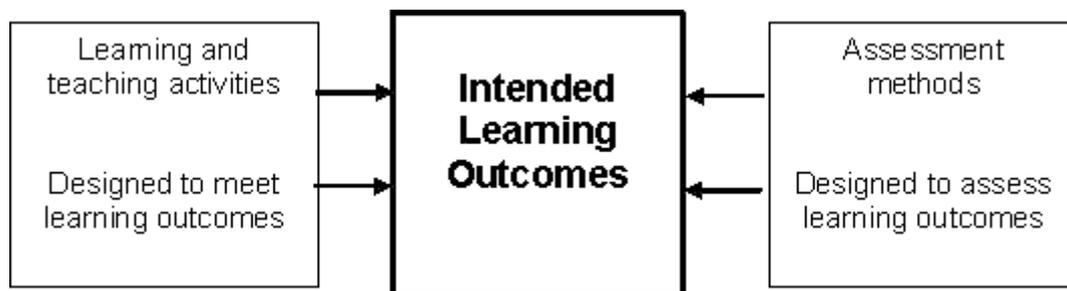
Some of the required learning outcomes of the clinical skills course component of the MBCHB curriculum at the end of the current third year of medicine are the achievement of a Miller's, knows how and shows how level of competency. This is required to enter the clinical years of medicine, years four, five and six.

### 3.6 Biggs' (1999) Alignment Theory

Teaching and learning take place in a system embracing classroom, department and institutional levels. If the various components such as the curriculum, the teaching and the assessment tasks are not well integrated and tuned to support learning then the system does not provide the optimal conditions for successful learning.

Constructive alignment is an approach to curriculum design that optimises the conditions for quality learning. In order to learn successfully a learner must construct meaning through the learning activities. Alignment refers to what the teacher or institution of learning does to set up an environment of learning that supports the learning activities. This then facilitates the achievement of the desired learning outcomes. The key is that the components in the teaching system, especially the teaching methods used and the assessment tasks, should be aligned to the learning activities to achieve the desired outcomes as illustrated in figure 4, (Biggs, 1999).

Figure 4. Aligning learning outcomes, learning and teaching activities and the assessment. Adapted from Biggs (1999:27).



### 3.7 Conclusion

In this chapter, various conceptual theories were presented which informed this study. These include experiential learning theory, prior knowledge, transfer theory, Biggs' constructional alignment theory, and Miller's framework of clinical competence.

The prior knowledge of the medical students gained from their South African rural life experiences as well as their learning experiences in rural schools in South Africa play a pivotal role in the prior knowledge that they take with them to Cuba. These students then start their medical training in Cuba with exposure to the Cuban lifestyle, culture, language and the medical context of their medical universities, hospitals as well as the Cuban communities. They have been surrounded and submerged in the Cuban lifestyle, culture and language and have learnt medicine in this environment.

After having these experiences for 5 years in this Cuban environment within the medical context, they then return to their home country, where a different medical context, language, culture and different expectations of learning outcomes from these experiences awaits them. The students return to South Africa and use their prior knowledge, their experiential learning in Cuba, and basically translate it or transfer it into a new environment, lifestyle, culture and language as well as a different context and system of practicing medicine.

This may be part of the context and culture of learning which students find problematic and relates to transfer of learning theory. It is believed that the prior knowledge and experiential learning of the students firstly during their secondary school training in rural South Africa and then in medical universities and hospitals in Cuba would explain that some learning has not transferred adequately.

The next chapter describes the research methodology of the study. An explanation of data collection, sampling, data analysis procedures as well as limitations are presented.

## **CHAPTER FOUR: METHODOLOGY**

### **4.1 Introduction**

This chapter provides details of the research methods and procedures utilised for the study. The data collection, sampling and analysis are explained and the limitations of the study are specified. This study was conducted at the Nelson R. Mandela School of Medicine in the second semester of 2013. A mixed- methodology strategy was used to collect data about the SACMC collaboration program students' prior clinical skills training experiences and their perceptions of their clinical competence upon reintegration into the South African medical landscape.

### **4.2 Research Design**

The study was conducted using a qualitative research approach. This is a case study with the purpose of which is to understand the experience from the participant's viewpoint. An inductive phenomenological approach was chosen over the traditional positivist methodology as the study does not intend to prove or disprove any hypothesis but seeks to explore perceptions of students' reality.

This methodology of research involves the collection, organization and interpretation of data derived from an exploration into meaning of social phenomena (Malterud 2001). The overall goal of this type of research is to develop concepts that might help us to understand social phenomena. This is accomplished by "giving emphasis to the meanings, experiences and perceptions of participants" (Ringsted et al 2011: 699).

The ultimate aim of using a qualitative approach was to understand the diverse perspectives and experiences of the students in their natural context. The theoretical perspective often associated with qualitative research is phenomenology. Phenomenology is the "perception of the meaning of an event, as opposed to the event as it exists external to the person. (Leedy, Omrod 2005: 139) In phenomenological

studies we try to answer the question “what is it like to experience such and such” (Leedy, Omrod 2005: 139). During the data collection process, “the researcher suspends any preconceived notions or personal experiences that may unduly influence what the researcher “hears” the participants saying” (Leedy, Omrod 2005: 139). Following the phenomenological approach researchers seek to understand meaning in events and in human interactions.

Qualitative research often typically serves the purpose of revealing the true nature of certain situations, relationships, systems or processes. The goal of the research is to gain insight and explore the complexity inherent in the phenomenon. Qualitative data analysis was selected for its inductive approach which offers, the unfolding of themes and interconnected ideas. “The conceptual framework is then interpreted by the researcher with reference to the literature on a topic in an attempt to explain with a theory the phenomenon being studied” (Suter, 2005).

### **4.3 Study Area/Setting**

The Nelson Mandela medical school campus was originally a racially segregated part of the University of Natal. It was one of the few tertiary institutions legally allowed to provide education to black people during apartheid. It was granted Nelson Rolihlahla Mandela's name on its 50th anniversary in the year 2000. The Nelson R. Mandela School of medicine has been involved with the SACMC program from its onset. Students have been coming to the university for over a decade. Students currently at the University of KwaZulu-Natal, Nelson Mandela School of Medicine who are part of the 2013 returning cohort of the South-African-Cuban medical training collaboration programme were interviewed.

### **4.4 Study Sample**

Purposive sampling was used which means that a sample is purposely selected for its potential to yield insight into the phenomenon. The participants of the study are selected to serve a specific purpose, i.e. to gather data from information-rich sources. Purposive sampling gathers information that would uncover conceptual relationships (Suter, 2005). In this study the purposive sampling is to gather data rich enough to develop a theory regarding the South African-Cuba collaboration programme. The sample was the current South-African-Cuban medical training collaboration programme students

who had just returned to South Africa and were assigned to complete their studies at UKZN. These medical students entered the programme after having completed their first 4-5 years in Cuba (2013 cohort). This includes a total of 11 students.

This qualitative phenomenological study used semi structured interviews and questionnaires to gather data to answer the critical questions. All students (N=11) who entered the 4th year of the South-African-Cuban medical training collaboration programme were invited to participate. The study sample included all the eleven South-African students who had studied in Cuba and who had enrolled for 4th year of study at the UKZN. This group was purposively sampled because they had recently returned to KwaZulu-Natal after having completed years 1-5 at a Cuban medical school. This sampling strategy was used because the sample was selected for its potential to yield the greatest insight into the clinical skills experience and perceptions of the cohort of students under study. All 11 students agreed to participate and signed an informed consent form.

#### **4.5 Piloted Study**

Two separate questionnaires were used in the study and were piloted to a random selection of 10 students from the 4<sup>th</sup> year medical students in 2013. This was done to ascertain whether the questionnaires were clear and coherent and easy to understand by a student at the level of the 4<sup>th</sup> year of study. The pilot revealed that the questions were easy to understand.

One amendment was done based on the pilot. We removed the year of study as to when the clinical skill was performed. We had a question where we asked in which year of study, the skill was taught. The students found it difficult to remember when exactly they did a particular skill but could remember if they had done the skill. We follow a spiral curriculum and certain skills are repeated in different years with varying levels of complexity, so it would be difficult for the students to also remember accurately. For example resuscitation is taught in year 1, 2, 3, 4, with increasing levels of complexity added.

**Table 3: A methodological summary of the study**

<b>Research Question</b>	<b>Conceptual framework</b>	<b>Data Source</b>	<b>Data collection tools</b>	<b>Data Analysis method</b>
1. What curricular approach and clinical skills content were the SACMC students exposed to during their Cuban based training in medicine? (Student perceptions of curricular approach and clinical skills content)	Kolb Experiential learning,(Kolb,1984), Prior knowledge (Kujawa and Huske,1995) and Biggs' (1999) alignment theory	students	Questionnaire and interviews	List of curriculum subjects. Thematic analysis of interviews for approach and content of teaching.
2. What clinical skills training did the students receive in the Cuban setting and how does the training compare to that offered at the UKZN?	Miller's clinical competence Theory (1990) and experiential learning	students	Clinical skills questionnaire	Basic descriptive statistics
3. To what extent has students' prior clinical experiences and skills training in Cuba facilitated their clinical preparedness in the local clinical setting?	Biggs' alignment (1999) theories and Transfer theories (Perkins and Salomon,1992)	students	Questionnaire And Interviews	Basic descriptive statistics and thematic analysis

## 4.6 Data Collection

The research questions and objectives of the study that informed the way the data was collected.

1. What curricular approach and clinical skills content were the SACMC students exposed to during their Cuban based training in medicine? (Student perceptions of curricular approach and clinical skills content)
2. What clinical skills training did the students receive in the Cuban setting and how does the training compare to that offered at the UKZN?
3. To what extent has students' prior clinical experiences and skills training in Cuba facilitated their clinical preparedness in the local clinical setting?

Questionnaires and semi structured audio recorded interviews were used to collect data about question (1, 2 and 3). Data was collected by means of 2 self-administered questionnaires. All 11 students were asked to complete both questionnaires. The first questionnaire dealt with general demographic details, scholastic ability, the philosophy and content of the Cuban curriculum. The second questionnaire was a clinical skills questionnaire.

The Clinical Examination Skills Questionnaire (Appendix 6) consisted of a list of clinical skills which had been taught to local students on the MBChB programme at the NRMSM. For each of the listed skills, participants were asked to indicate:

- a) Whether they had been exposed to the skill: (had been taught the skill; yes/no)
- b) The setting in which the he skill had been taught (lecture, ward, or skills laboratory)
- c) Their perceived ability at performing the skill (these ranged from being able to perform the skill independently; can perform it with supervision, being able to perform after revision, will not attempt it at all)

The questionnaire (Appendix 6) elicited information in 9 categories including skills relating to: communication, resuscitation, adult examination, newborn examination, general procedural skills, specimen collection, obstetrics and gynaecology procedures, airway management procedures and radiological examination. In total the list consisted of 75 clinical skills in the nine categories that were deemed important for entry and success at the 4<sup>th</sup> year level of a NRMSM medical student. The skills were described as basic and essential for students studying on the MBChB programme at the UKZN.

The two questionnaires were completed sequentially. Qualitative data were collected through interviews which were conducted two weeks after the administration of the skills questionnaire. Interviews lasting 35 - 40 minutes were conducted in the researcher's office at the university to ensure the students had privacy, were comfortable and had easy access to return to the wards. Firstly, general information was gathered and then later more sensitive and specific topics were introduced as good rapport was established initially between me and the participants. Interviews were audio-recorded after obtaining permission to do so from each student at the beginning of their interview. This was done to ensure the accuracy of the information. Audio CDs will be stored securely in a locked cupboard in the researcher's office and will be retained for a period of five years as per university stipulations. All 11 students were asked to complete 2 questionnaires prior to the interviews. The interview questions and all the questionnaires appear in the appendix.

#### **4.7 Data Analysis Strategies**

Cresswell (1998) quoted in (Leedy, Ormrod 2005: 150) has described a data analysis spiral that can be used in qualitative studies. This spiral involves four steps namely the organisation of the data (filing, database usage and breakdown of large units to smaller units), perusal of the data (getting an overall sense of the data and preliminary interpretations), classification of the data (grouping into themes and categories and patterns) and finally the synthesis of the data, (integration of the data and hypothesis formation). I used this data analysis spiral to analyse the data gathered from the interviews and the questionnaires. In addition to this, basic descriptive statistical analysis was performed on the data.

The data collected from the two questionnaires were analysed in terms of basic descriptive statistics and were displayed as tables with multiple columns, allowing comparison to be made with all eleven students. The second questionnaire was a clinical skills questionnaire which provided a large amount of information and was analysed carefully. Quantitative data was collected from the questionnaire. All quantitative data was entered onto an Excel spreadsheet and each item was analysed with basic descriptive statistics. Qualitative data from the interviews was transcribed and thematically analysed. The qualitative data was analysed initially according to the following four themes i.e. clinical skills experiences of teaching, learning relationships, clinical assessments and self-reflection. These were then narrowed to

three areas that of the Cuban philosophy, clinical skills competency, student awareness of gaps in knowledge and suggestions for improvement of program.

#### **4.8 Ethics and Human Subjects Issues**

Permission for the study was obtained from the Humanities and Social Science Research Ethics Committee (HSS/0974/012M) of the UKZN and gatekeeper permission was granted by the Dean of the School of Clinical Medicine and the registrar of the University of KwaZulu-Natal. Individual informed consent was obtained from each respondent after having been informed of the nature and purpose of the study; their rights in terms of voluntary participation; and having been given assurance of confidentiality and anonymity.

#### **4.9 Role of the researcher**

Specific challenges of qualitative research include reflexivity, the researcher's perspective which is based on the researcher's personal and professional experiences as well as beliefs about the way life works. The way to avoid reflexivity is for the researcher to identify and share his/her own preconceptions and bias surrounding the research and establish a strategy for creating a neutral position in the research. (Malterud 2001).

I am a clinical coordinator of the 4<sup>th</sup> year of the MbchB programme and a lecturer for the first three years of the MBCHB programme. I have had involvement with previous Cuban students in 2012 and the remediation programme. However for the 2013 cohort of Cubans I was not involved with the teaching of clinical skills prior to my study. In 2014 I did a revision program of clinical skills with the same students, which was about 6 months after collecting my data. None of the participants had any pre-existing personal relationship to me. All were unknown to me. I am not a coordinator of the Cuban medical students and not an examiner of the 4<sup>th</sup> year student's examinations or any of their assessments.

I am involved in teaching within the clinical skills lab for students from the first to the third year of study and I am involved in the clinical assessments for students from these years only. Consequently there were no power relationship issues that could have arisen in this study.

#### **4.10 Trustworthiness of the qualitative data**

There are four ways to assess reliability and validity of qualitative studies. These include the following: transferability which refers to evidence supporting generalization of findings to other contexts; dependability which is reproducing similar findings if the study was done again, confirmability is the control of bias of the researcher and credibility which is believability of findings enhanced by evidence and theoretical fit. (Suter, 2005: 363)

Ways to reduce bias and improve trustworthiness in a study (Suter, 2005: 364 ), include using expert consultation , providing rich detail to contextualize the study , detailed record of data collection and the use of triangulation, where multiple data sources are used.

Another challenge is transferability, the researcher has to determine both whether the study is internally valid and whether it is externally valid and whether the results of this study will be transferable to all South African-Cuban collaboration students completing their training in South Africa. In qualitative research this is usually achieved by purposive sampling and consideration of those to whom the finding will actually concern (Malterud 2001).

Trustworthiness of qualitative data deals with issues related to credibility, transferability, dependability and confirmability (Shenton, 2003, and Guba, 1981). In this study, trustworthiness was established in the following ways.

**Credibility** deals with the adoption of well-established research methods. In this study, the qualitative data was collected by means of the open ended questions on a questionnaire and through interviews with the participants. These sequential and complimentary phases allowed data to be collected in two different ways and ensured that data collected in phase one guided the process in phase 2, thereby adding to the rigor of the study. The researcher and supervisor ensured that all information from both instruments had been included which also assists with credibility.

Each semi-structured interview was conducted in an office at the school and audio recorded after obtaining students' consent for the interview and for the recording thereof. Each interview was completely private with one student at a time. The researcher also made notes during the interview. Interviews were listened to carefully. The interviews were transcribed by the researcher and the transcriptions were checked against the recordings to ensure the

accuracy of the transcriptions. The researcher identified and coded the themes after the transcription process and these were cross checked with the supervisor. Qualitative reliability was improved through ensuring that errors did not occur when transcribing the raw data by going over the audiotaped interviews more than once, and comparing it to the final transcribed data. The data was analysed and the themes identified and then cross checked to ensure accuracy. The supervisor verified the themes and the dependability of the data.

- Triangulation of data sources into the phenomenon was obtained by piloting the questionnaire with a purposive sample of 4<sup>th</sup> year students, documents from meetings around the SACMC and exam board minutes relevant to the issue.
- In addition, qualitative research requires a “thick description” of the phenomenon under study. To achieve this goal, the researcher had included detailed information of the context of the study, illustrated examples of the clinical skills associated with a theme to convey sufficient background information on the “actual situations being investigated and the extent of the contexts that surround them”. (Shenton, 2003:69)
- The honesty of the informants were ensured as all participants had been informed of the study, asked whether they would like to participate, and informed that they could refuse or withdraw at any stage during the process.

**Transferability** was achieved in that large amounts of background information had been included to establish the context of the study, detailed descriptions of the cohort and the phenomenon being studied to ensure that other researchers would be able to determine if the results were transferable to their contexts.

**Dependability** was ensured through the use of the piloting process with a group of 4<sup>th</sup> year students to ensure that the questionnaire, as data collection instrument, collected accurate and useful data. Methodological descriptions were included in the research report and all questionnaires and interview questions have been included in the appendices. This allows for the study to be repeated and enables future researchers to repeat the work.

**Confirmability** was ensured through the following:

- Triangulation of data sources and research methods was used as noted above to reduce the effect of researcher bias. Other data sources included the minutes of

examination board meetings that affirms the trustworthiness of the collected data regarding the preparedness in clinical skills of the Cuban trained students.

- The beliefs of the researcher were admitted at the outset which stated that the researcher and other clinical educators did not have an adequate understanding of the clinical skills preparedness acquired by Cuban trained students. ( p3 of the introduction) The researchers' interest in understanding the phenomenon, as 4<sup>th</sup> year coordinator and lecturer has also been described.
- The shortcomings and limitations of this exploratory case study had been highlighted. One of main limitations relates to the inability at this stage to provide an accurate measure or assessment of students' actual competence. This study relied on students' perceptions of preparedness.

## **4.11 Limitations of the study**

Limitations are provided so that the findings may be evaluated from an informed perspective. Limitations are discussed in terms of the design of the study, the researcher, the research instruments and the limitations of the participants.

### **4.11.1 Study design**

In terms of the design of the study qualitative data is not always generalizable and might not apply to other students and other contexts.

### **4.11.2 Limitations as a researcher**

I am still a novice researcher and therefore a more experienced researcher might have designed the study differently. Themes were verified by my supervisor. It is also important to note that more information on the SACMC training programmes and collaborations with various countries probably exist in Spanish but only those available in English had been accessed.

### **4.11.3 Limitations of the research instruments used in the data collection.**

Questionnaires were used to collect students' perception of performance rather than actually assessing their performance which is a limitation. Interviews were time consuming and could have been intimidating for the shy or nervous student. Some students were more vocal and freely shared their thoughts and feelings when compared to others.

#### **4.11.4 Limitations of participants**

Fourth year medical students have very busy timetables and various module requirements. Students had to take time-out from their busy schedules in order to present themselves for the questionnaires and for the interviews. So stress, fatigue, and other distracting factors might have contributed to their abilities to accurately recall their experiences. The students spent 5 years in Cuba and I am testing their ability to recall the previous 5 years. This might have been challenging for some of the students with recall bias being a factor to take into account.

#### **4.12 Conclusion**

This chapter has provided an overview of the research design, the study population, the data collection tools used in the study and how the data was collected, analysed and was elaborated on. The role of the researcher, the trustworthiness of the methods used, the ethical issues and the limitations of the study were discussed. The following chapter discusses the data findings and is dedicated to the presentation and analysis of the qualitative and quantitative data.

## **CHAPTER 5: FINDINGS**

### **5.1 Introduction**

This chapter contains the results obtained from the analysis of all the data. This includes the data analysis of two questionnaires, a general demographic questionnaire which included questions to elicit curriculum content and approach, as well as a clinical skills questionnaire and finally an analysis of the interviews.

The findings will be reported according to my original research questions:

1. What curricular approach and clinical skills content were the SACMC students exposed to during their Cuban based training in medicine? (Student perceptions of curricular approach and clinical skills content)
2. What clinical skills training did the students receive in the Cuban setting and how does the training compare to that offered at the UKZN?

3. To what extent has students' prior clinical experiences and skills training in Cuba facilitated their competence/clinical preparedness in the local clinical setting??

## **5.2 Demographic Characteristics**

Eleven students from the South African Cuban Medical Collaboration programme joined the NRMSM at UKZN in 2013. All 11 students agreed to participate in the study. All the students are South African citizens, four students are female and the average age of the group was 26 years. The majority of students matriculated having studied English, Mathematics, Biology and Physics at senior secondary school level and 10 students also studied Physics at senior secondary school.

Students attended the local rural schools in their respective areas while growing up. For five this included schools in the Limpopo province; another five matriculated from KwaZulu-Natal and one from Eastern Cape. Seven students reported growing up without their fathers and reported being raised and cared for by their mothers. Six students in this group reported having also reported growing up without mothers (either deceased/absent). At the time of the study all students had at least 4 siblings. In terms of scholastic ability, 5 of the students received an A average on the senior certificate examination upon graduating from high school by achieving between 71-80% class percentage. Four students scored between 61-70 % range, while two students obtained a percentage between 51-60% in their final secondary examination.

Ten students had access to textbooks while studying at school. Only 2 students reported having access to a computer and the internet while at school. Only one student had access to a home computer. None of the students had internet access at home at the time of their secondary schooling experiences.

## **5.3 Curriculum approach**

The students in this sample attended one of 3 universities in Cuba during their six year medical training period. Four students (2 female, 2 male) studied at Cienfuegos; three students (2 male, 1 female) studied at Villa Clara and four students, (1 female, 3 males),

studied at Sancti Spiritus. With reference to the style of teaching used during their prior MBChB training, six students reported being taught primarily in a lecture style and theoretically oriented curriculum. Four students studied in a Problem Based Learning curriculum and one student indicated that theoretical lectures and PBL methods were equally used during her studies in Cuba.

The Cuban programme emphasised a primary health care approach and all the teaching in the undergraduate curriculum was aimed to treat and manage patients with disease profiles which are prevalent in the Cuban context. Patient management strategies are also based on preventive measures and tertiary levels of care were not emphasised in the Cuban curriculum. All students underwent individual bedside clinical assessments where their clinical skills were assessed based on the taking of a history and doing a physical examination on a real patient in either the hospital or a clinic setting.

Most of the students reported having access to the library, textbooks, study notes, lecture material, electronic resources, internet training and internet usage. In terms of oral presentations all students had exposure to them. Students reported frequent team work based learning experiences. Most of the students reported having access to and being required to conduct research projects, community projects as well as report writing.

#### **5.4 Content of Medical Curriculum in Cuba**

Data collected from the student responses in Table 5 indicate that the schools offered the following content as part of the undergraduate medical curriculum in Cuba.

Table 4: Content of medical curriculum in Cuba

<b>First Year</b>	<b>Second Year</b>	<b>Third Year</b>
Spanish (conversational and medical) Morphophysiology (integrated course that combined Anatomy and Physiology with embryology and biochemistry) Biochemistry Histology Computer Literacy Philosophy Physical Education	Physiology Anatomy Embryology, Microbiology Pharmacology Genetics Pathology Family Medicine Statistics Histology Psychology Physical Education Computer Literacy Philosophy	Propodeutica (an introduction to medicine) Internal medicine Psychology Pharmacology Anaesthesia Semiology Family Medicine
<b>Fourth Year</b>	<b>Fifth Year</b>	
Paediatrics Obstetrics and Gynaecology Surgery Family Medicine Nursing Internal medicine An elective in any discipline.	Public Health Family Medicine Internal Medicine Dermatology Urology Otorhinolaryngology Ophthalmology Psychiatry Forensics Chinese Medicine Medical English An elective in any discipline.	

## **5.5 Students exposure to clinical skills**

Students were asked to rate their exposure to the clinical skills which are regarded as core in the training at the UKZN. Table 6 and 7 below present the clinical skills topics in 9 categories with the students' rating and learning environment of their Cuban based training. The tables also demonstrate the breakdown within each category of non –exposure and exposure of the skills as well as the location of training.

**Table 5 : Overall Clinical skill results showing Exposure and Non – Exposure to clinical skills in Cuba and location of training for each skill as well as the level of performance**

SKILLS	EXPOSURE		SETTING				LEVEL OF PERFORMANCE			
	Yes	No	Lecture Theatre	Ward	Laboratory	all	independent	With supervision	With revision	Not at all
<b>ADULT:</b>										
General examination	11	0	5	4	2	5	2	5	3	1
Cardiovascular	11	0	8	8	2	2	4	4	4	0
Respiratory	11	0	6	7	3	3	5	2	4	0
Abdominal	11	0	7	8	2	2	2	5	4	0
Neurological	11	0	8	10	2	0	1	2	7	1
Obstetrical	11	0	7	9	0	1	2	4	3	4
Gynaecological	11	0	6	7	0	1	1	3	4	1
Neck Thyroid exam	11	0	8	8	1	1	5	2	4	4
Exam male ext. genitalia	11	0	5	6	0	1	1	3	2	1
Rectal examination	11	0	6	5	0	2	2	4	2	0
<b><u>Newborn Examination</u></b>										
General exam newborn	10	1	6	8	0	1	2	3	4	1
<b><u>Radiological examinations</u></b>										
CXR	9	2	7	8	0	1	1	5	3	0
Abdominal XR	9	2	7	8	0	1	0	4	5	0
XR Bones and Joints	9	2	7	7	0	1	1	3	4	0

<b>Specimen Collection</b>										
Fungal scrapes	9	2	1	1	0	0	0	1	0	0
Wound swabs	5	6	4	4	0	0	1	2	1	1
Blood culture	4	7	0	2	1	2	1	1	1	1
Nasal and throat swab	2	9	1	1	0	1	2	0	0	0
Urine/stool specimen	7	4	2	2	0	2	1	2	3	1
Gastric washings	2	9	1	1	0	0	0	1	1	0
Sputum collection	7	4	2	5	0	1	5	1	1	0
Pus aspirate	3	8	2	2	0	0	1	0	1	1
Pus swabs	5	6	2	3	0	0	1	1	1	0
Urine collection	6	5	3	5	0	0	2	1	3	0
Use of urine dipstick	1	10	1	1	0	0	0	0	1	0
<b>SKILLS</b>	<b>EXPOSURE</b>		<b>SETTING</b>				<b>LEVEL OF PERFORMANCE</b>			
<b><u>Obstetric and Gynae procedures</u></b>	Yes	No	Lecture Theatre	Ward	Laboratory	all	independent	With supervision	With revision	Not at all
Pap smear/ smear	2	9	0	2	0	0	0	2	0	0
Speculum insertion	9	2	2	8	0	2	2	5	2	1
Mechanism of labour delivery	5	6	3	3	0	1	1	0	0	4
<b><u>Airway management procedures</u></b>										
oropharyngeal airway	3	8	0	2	0	1	0	0	1	1
Cricoid pressure	1	10	0	1	0	0	0	0	0	1
Suctioning of airway	3	8	0	2	0	1	0	0	2	1

<b>Airway management procedures</b>										
Bag –valve mask	1	10	0	0	0	1	0	0	1	0
Orotracheal intubation	5	6	2	2	0	2	0	0	1	3
Oxygen administration	8	3	0	6	1	2	2	0	3	2
Use of nasal cannulae	4	7	1	1	0	2	1	1	1	1
laryngeal mask airway	6	5	3	18	0	2	2	0	1	3
Use of face masks	7	4	3	3	0	1	2	2	1	2
<b>Asthma adjuncts</b>										
Peak flow meter	1	10	1	1	0	0	0	0	1	0
Metred dose inhaler	0	11	0	0	0	0	0	0	0	0
Spacer devices	0	11	0	0	0	0	0	0	0	0
Nebulisation	0	11	0	0	0	0	0	0	0	0
<b>Procedures</b>										
Rapid cholesterol test	0	11	0	0	0	0	0	0	0	0
Glucogel administration	1	10	0	0	0	0	0	0	0	0
50% dextrose administration	5	6	4	3	0	1	1	1	1	2
Haemoglucotest	2	9	2	2	0	0	0	0	1	1
Body Temp	10	1	7	8	0	2	9	2	0	0
Rapid Hiv test	0	11	0	0	0	0	0	0	0	0
Mantoux	7	4	5	4	1	1	1	1	5	0
12 lead ECG	9	2	6	6	0	1	1	0	0	0
Adult Anthropometry	5	6	5	4	0	0	1	9	3	0
Infant anthropometry	10	1	6	9	1	1	3	3	3	1

SKILLS	EXPOSURE		SETTING				LEVEL OF PERFORMANCE			
	Yes	No	Lecture Theatre	Ward	Laboratory	all	independent	With supervision	With revision	Not at all
Peripheral IV cannulation	5	6	0	3	1	2	2	3	0	0
Insertion of CVP	1	10	0	1	0	0	0	0	1	0
Lumbar puncture	7	4	3	4	1	0	2	2	0	2
Spinal block	1	10	0	1	0	0	0	1	0	0
Nasogastric tube	7	4	3	3	1	1	1	2	0	4
Blood collection	8	3	3	4	2	1	3	3	1	1
Urinary catheterisation	10	1	3	7	3	1	3	2	3	1
<b>Resuscitation</b>										
One man CPR for an adult, child, infant	4	7	0	0	2	2	1	2	1	0
3 lead ECG monitoring	3	8	1	2	1	1	2	0	1	0
AED	0	11	0	0	0	0	0	0	0	0
Defibrillator	0	11	0	0	0	0	0	0	0	0
Recognition of cardiac arrest arrhythmias	6	5	5	6	0	0	0	3	1	2
Neonatal resuscitation	3	8	3	1	0	0	0	1	1	1

Skill	Exposure		Setting				Level of performance				Language		
	yes	no	Lect.	Ward	Lab	all	Indep.	Supervision	Revision	Not all	Spanish	English	Both
<b>Communication skills</b>													
Approach to communication	8	3	6	5	0	2	5	1	2	0	2	0	6
General history taking	11	0	7	10	2	1	7	1	3	0	9	0	10
Cardiovascular history	11	0	6	9	2	2	5	3	3	0	2	0	9
Respiratory history	11	0	6	9	2	2	6	2	3	0	2	0	9
Gastrointestinal history	11	0	6	9	2	2	6	2	3	0	2	0	9
Neurological history	11	0	6	9	2	2	3	5	2	1	2	0	8
Obstetrical history	10	1	7	9	1	1	5	1	3	1	3	0	6
Gynaecological history	10	1	7	9	1	1	4	2	3	1	3	0	6
Urinary history	11	0	6	9	2	2	4	3	4	0	3	0	8
Bereavement counselling	0	11	0	0	0	0	0	0	0	0	0	0	0
Counselling of HIV positive Patients	1	10	9	0	0	0	0	0	1	0	1	1	1

**Table 6: Comparison of Clinical skill Exposure and Non – Exposure of the Cuban trained students per category and training location**

Skills Categories	Number of skills	Number of Skills where majority of students had reported no exposure in Cuba.	Number of Skills where majority of students reported exposure in Cuba	Location of training
Communication skills	11	2 bereavement counselling of HIV positive patients	9 skills	Mainly learnt communication skills in lectures and wards
Resuscitation skills	6	5	1	Recognition of cardiac arrest arrhythmias was the only skill that students reported having any exposure to and whatever exposure that was gained was predominantly in the ward
Adult examination	10	0	10	All eleven students were taught the basic adult examination skills predominantly in lectures and ward based environments. Only 3 students reported some exposure in a clinical skills laboratory or simulated clinical environment.
New-born examination	1	0	1	Majority of students were exposed to this in the wards.
Specimen collection	11	7	4	Sputum collection, urine collection and fungal scrapes were reported to have been taught predominantly in the wards and in lectures
General procedures	17	9	8	In lectures and clinical wards
Obs. & Gynae procedures	3	2	1	In clinical ward
Airway procedures & asthma adjuncts	13	10	3	In clinical ward
Radiological exam.	3	0	3	In clinical ward
Totals	75 skills	35 skills no exposure	40 skills exposure	

A total of 75 clinical skills had been taught at UKZN on the MBCHB curriculum during the first three years. As indicated quantitatively in Table 4, students who studied in Cuba reported no exposure to 35 - and exposure to 40 of the skills which had been passed by the local students.

## 5.6 Impact of prior clinical experiences and skills training on perceived preparedness

The table below gives a breakdown of the data recorded when students rated their perceived competence in the listed skills.

**Table 7: Perceived Competence of the skill in majority of students:**

<b>Skills (no. of skills in the category)</b>	<b>No. of Skills where majority 50% or at least six students were able to do independently</b>
Communication skills(11)	3 skills General, respiratory and gastrointestinal history taking
Resuscitation skills (6)	None
Adult examination (10)	none
Newborn examination skills (1)	none
Specimen collection (11)	none
General procedures(17)	1- Taking body temperature.
Obstetrics and gynaecology procedures (3)	none
Airway management procedures and asthma adjuncts (13)	none
Radiological examination (3)	none
Totals (75)	4

## 5.7 Impact of prior clinical experiences on student competence

Students were interviewed about their training experiences in Cuba and the interviews were transcribed and then thematically analysed. The analysis of the interviews generated the following themes to answer the final research question which is: To what extent has students' prior experiences, academic preparedness and skills training facilitated a perceived preparedness in the local clinical setting. The following 3 themes emerged from the qualitative data from the interviews.

### 5.7.1 Philosophy of the Cuban Curriculum

Data elicited from interviews with students confirmed that they experienced the curriculum as didactic teaching supported by many lectures and seminars. The practical components of the course received much less attention and emphasis. The content of the curriculum was in line with the Cuban health care system and Cuban health issues. This included predominantly primary health care and community medicine. South African health issues such as HIV and Aids and infectious diseases received little additional emphasis.

“Well clinically in Cuba, there we don't get exposure to do things practically like taking blood and all those things like delivery, those things you do when you are a qualified doctor.”

Student A (male)

” Well about Cuba what concerns me, those people they focus on the problems of their country like treating TB, there is no TB there. In the exam you will never find someone talking about HIV there. Even their snakes are not toxic. Even if they bite you nothing can happen. ... Clinically- wise in Cuba we were not exposed to such things. O and G in Cuba is totally different, the classification of the disease is different, when they ask you here they are totally different even in terms of giving medications.”

Student F (male)

“With the theory we are not bad. The one thing we need to learn is infectious diseases, because that's what matters here with HIV and Aids. I can see the concepts, I can probably talk about it but I don't know how it presents. It's easier to teach me about it when I see a patient, and TB. , Its bread and butter here in South Africa actually all infectious diseases, its really what matters here.....: “ We just had a brief overview of HIV and Aids but they don't give much theory, just a brief summary, about 10 lines.”

Student C (female)

### 5.7.2 Clinical skills experiences of teaching in Cuba

Clinical skills teaching and learning occurred mainly in the lecture theatres and seminar rooms and wards during ward rounds and patient presentations. Students reported working in groups of 20-30 students around the bedside during the teaching of clinical skills. In addition to large numbers of students in the groupings, the students also had to compete with other general practitioners and student interns who joined ward rounds. Sometimes students were unable to examine patients who were being presented due to the large numbers of other doctors and students who also wished to learn and practice their clinical skills on patients.

“In Cuba the clinical experience was not really fruitful in the ward when you doing ward rounds there are more than 25 students around the same bed...Not really easy to learn...There are many medical practitioners in Cuba, GPs and doctors and many learning...in our group there were 30 students.”

Student F (Male)

“The whole group is 20-21 students, in 3<sup>rd</sup> year, other students will be there and registrars and consultants.”

Student B (female)

The teaching was theory-oriented with not much exposure to the practical application of clinical skills.

“Good at theory they gave us almost everything in theory. Although had exposure of clinical skills, not as much as we are expected to have, lack a lot in terms of practical skills, lacking in practical skills...groups of 30 students...”

Student G (male)

“In Cuba students are not hands on, here students are hands on, they can insert iv lines.” The same student says “We are fine with the theory...we lack the practical side of it ...it makes it difficult to remember the theory.”

Student C (female)

All students reported positive experiences in their learning relationships in Cuba. Their professors were willing to help them to understand difficult concepts in theory.

“The Cubans make you feel like you not inferior like you on the same level as them, really good people, we were close , they would invite you to their house, come to dinner, they were taking us like we are family, I don’t know if it was just my consultants.”

Student B (female)

“First of all Cubans as general are very nice people, they love foreign people, they pay more attention to foreign people, they know guti [isiZulu] that it was just difficult for some reason. They help us through the studies.”

Student E (female)

### **5.7.3 Clinical skills competency, student awareness of gaps in knowledge and suggestions for improvement of program.**

Students hold the understanding that the types of disease profiles of Cuban patients are different from those seen in South Africa and hence they would benefit from early exposure to clinical skills training. Students also expressed the need to be taught in English. They received their training exclusively in Spanish and experienced the medical terminology used in English when back in South Africa as difficult and challenging to adjust to. Students thought that they would have benefitted from less theory and more practice especially in the application of the clinical skills in their curriculum. Some of the students also expressed their frustration with the fact that their Cuban teachers did not have access to a South African curriculum. They thought that they would have benefitted greatly if health issues of relevance to the South African perspective could be discussed.

“Procedures not exposed to can be improved. In Cienfuegos in my campus, the South African were taking nursing classes because we complained of that”

Student D (male)

“How they manage patients in Cuba is not the same. The disease... we focus on their disease rather than the disease here. I mean the exposure, so here its different.....I would say it needs improvement, here we have to recognise murmurs, maybe there its one patient out of 500 patients.”

Student E (female)

“Most of the time in the program its lectures so we don’t have enough time to practice clinical skills. Its theory based. For example even a final year student in O and G can finish the block without even doing a delivery.”

Student F (male)

## 5.8 Conclusion

This chapter revealed the following findings. The majority of students self-reported a lack of exposure to 35 of the overall 75 skills which are deemed important foundational skills in the MBChB context at the UKZN. The majority of students perceived themselves as being unable to perform 95% of the clinical skills. (i.e. 71 of a possible 75 clinical skills). Students perceived themselves able to perform independently 5 % of the clinical skills (i.e. 4 of 75 skills). These four skills were general history taking, respiratory history taking, gastro-intestinal history taking and the taking of a body temperature.

The interviews revealed that while the Cuban program is primary health care based, many primary health care skills are either not taught or practiced by students within the first 5 years of training in the Cuban setting. Three themes emerged and were discussed namely the philosophy of the Cuban curriculum in teaching and content, clinical skills experiences of teaching in Cuba and finally clinical skills competency, the student awareness of gaps in knowledge and suggestions for improvement of the program. The next chapter will present a discussion of the findings and will conclude with recommendations for future practice/research or policy.

## **CHAPTER SIX: DISCUSSION**

### **6.1 Introduction**

This chapter discusses the findings outlined in the previous chapter regarding the curriculum approach, content, clinical skills training and the students' perception of their clinical competence as acquired in the Cuban medical training contexts. It provides recommendations related to the SACMC programme and some conclusions to the study. The discussion is presented according to the aims of the study and guided by the original research questions.

### **6.2 Curriculum Approach and Clinical Skills Content**

The way in which the curriculum is enacted in Cuba can be described as a didactic, lecture-based approach with a focus on Cuban primary health care principles. There is little or no problem-based teaching as done at UKZN. At UKZN the theoretical content is delivered as part of the problem-based learning approach. It is systems based and offered over the first three years of study. The students do not rotate through internal medicine but they learn about the systems through various themes. For example, they do not do rotate through paediatrics but learn about newborn examination as part of a theme in growth and development. In Cuba, however, students rotate through disciplines and topics relating to basic sciences which are taught separately from the clinical sciences. At the UKZN, the basic sciences and clinical content is offered in an integrated curriculum as part of the PBL curriculum approach (Van Wyk & Madiba, 2006).

At the UKZN, students do not spend extended time in the clinical wards until their third year of study. They have limited clinical exposure in year 3 to patients in the wards with the majority of clinical exposure received in a simulated environment.

The students have full clinical exposure, from their 4<sup>th</sup> year to 6<sup>th</sup> year, rotating through the disciplines and spend the majority of their time in the clinical wards. In Cuba, however, ward based teaching starts in the second year and continues throughout the degree. Only one student, who

studied in Cuba, reported limited exposure to a clinical skills lab and simulated medical procedures as part of a nursing module offered to the student.

The theoretical content covered in disciplines and subjects between the two settings have some similarity however content included in the Cuban curriculum is indicative of the Cuban health care system and health issues such as an emphasis on family medicine, general practice and epidemiology relating to the setting. There is also a strong health promotion and disease prevention focus. Many commonly prevalent South African diseases are therefore neither discussed nor emphasised in the Cuban curriculum.

### **6.3 Students' training and perceived competence in performing clinical skills**

#### Communication Skills:

The qualitative data indicated that the majority of students have been taught the various components related to 9 of the 12 communication skills. These included an approach to skills in general history taking, cardiovascular, respiratory, gastrointestinal, neurological, obstetrical, gynaecological and urinary history. Except for one, all students lacked training in bereavement counselling and training and exposure to counselling of the HIV positive patient. This lack of communication skills is very challenging when the SACMC students join the UKZN class as communication skills teaching is foundational to the success of the clinical skills program. It is also often practiced with simulated patients. At NRMSM students are taught bereavement counselling as well as HIV counselling as they are exposed to such patients in the 4<sup>th</sup> year of study. The majority of students perceived themselves as competent in taking only three histories from patients, ie an independent general respiratory and gastrointestinal history.

#### Resuscitation skills:

All 11 students reported not having been taught on the use of an Automated External Defibrillator or a defibrillator. Although six students indicated having been exposed to the theory on the topic, most SACMC students lacked skills in resuscitation. These students indicated a need for a clinical supervisor to help them recognise the signs. One student thought that she would be able to perform a one man CPR independently and 2 students were confident that they could set up 3 lead ECG

monitoring. The students indicated that resuscitation skills were not emphasised in their Cuban-training curriculum.

Adult examination skills, specimen collection and all procedures:

All eleven students were exposed to the basic adult examination skills. However, none perceived themselves as being competent in performing any of these skills. Students were exposed to sputum collection, urine specimen collection and fungal scrapes in the specimen collection category. The majority of students were exposed to a mantoux, 12 lead ECG, infant anthropometry, lumbar puncture, nasogastric tube insertion, blood collection and urinary catheterisation in response to a total of 17 general procedures that were enquired about. The SACMC students only reported competence in a single procedure; that of taking a body temperature.

This study explored the extent to which SA-Cuban collaboration medical students' (SACMC) prior clinical training and experiences matched the clinical skills training offered to local UKZN students in the first three years. The results indicate a number of significant issues relating to the SACMC students' experiences and perceptions of their preparedness for clinical practice which range from a lack of clinical skills exposure, lack of clinical skill practice and perceived incompetence in the majority of essential skills.

The student's perceived lack of clinical skills exposure may be related to various differences between the Cuban and South African curricula. This is evident both in terms of the placement and training of the student at a particular institution in a context where the approach to training, patient disease profile and method of training is very different.

It is also evident in terms of the mismatch between students' exposures in the different curriculum phases in the two settings. SACMC students had received predominantly theoretical information on most of the clinical skills which had been taught in more practical (hands-on sessions) to students at the NRMSM. Skills training at the NRMSM is based on a system approach. Students first receive an overview, then practice on low fidelity models and peers before revisiting the skills while being supervised when working with patients.

Skills training in the Cuban setting occur much later in students' clinical training years. The fact that the SACMC students return to SA before reaching this critical point in the Cuban curriculum leaves them poorly prepared and disoriented upon entering halfway through the SA curriculum. SACMC students received theoretical information on the skills but in the context of being exposed to much fewer patients in the Cuban setting have had fewer opportunities to actually observe and practice these skills.

Furthermore, most of the training in Cuba occurs in clinical wards where it is much more difficult to initiate the practice of the skill on the real patient. At the local university students are taught in a dedicated clinical skills laboratory and they are supervised while practicing on models and their peers. Exposure to simulated patients and models greatly assist with practice time in the simulated environment before exposure to real patients. This phased approach allows students to develop confidence and to receive feedback in safe settings which greatly impacts on future practice. For example the use of a defibrillator and CPR are introduced much later in the Cuban curriculum with reference to the teaching of resuscitation skills.

Research on clinical skills acquisition using traditional methods of clinical medical education versus simulation-based methods of medical education with deliberate practice show that clinical skills acquired in simulated settings is superior and transfer directly to better patient care and outcomes (McGaghie et al, 2011). Simulation is not meant to replace the need for learning in clinical working environments; it simply helps students to improve their preparation for the clinical environment and ultimately improves their clinical experiences (Maran and Glavin, 2003).

Local Cuban students who continue and complete the degree in Cuba would therefore receive adequate exposure to the skills but at a later stage. The SACMC students who join the SA program, where students have been introduced to the use of a defibrillator from the first year of medical school, have missed this exposure and need additional sessions to correct the disadvantage. As mentioned previously in the paper, constructive alignment is essential to ensure that the planned learning activities in the curriculum, help students achieve the expected learning outcomes (Biggs, 1999).

Skills in which the SACMC students had received inadequate exposure relates to bereavement counselling and HIV/AIDS counselling. This lack of exposure to this component in training is

indicative of the differences between the health/disease profile and health care contexts of the countries. Given the large HIV positive population in the South African setting, this skill is one which is highly required and practiced in the South African context and therefore deemed important to include during training. Students reported limited to no contact with HIV positive patients, due to a very low incidence of HIV positive patients and therefore a much lesser need to practice the skill in the Cuban setting.

Resuscitation skills and airway management skills are also addressed later in the Cuban curriculum whereas the skills are taught and practiced from the first year at the NRMSM. This is largely due to the local UKZN teaching philosophy and our problem based learning curriculum which reflects the higher incidence of trauma and emergencies in the local population. The prevalence has been linked to crime and the impact of the poor South African primary health care service as delivered to underprivileged communities which reflect the socio-economic differences between the countries.

SACMC students felt poorly prepared in the majority of the listed clinical skills to which South African students had been exposed during the first three years. It is possible that their perceptions might stem from an inability to transfer their knowledge between the different health care contexts and environments. Their insecurities may be related to far transfer (Perkins and Saloman, 1992). Educationally, we can only say that learning has occurred when students are able to demonstrate their learning.

The SACMC students are required to learn medicine in Cuba and practice medicine in South Africa. The findings indicate that transfer of clinical skills knowledge by students has not occurred optimally. The reasons can be explained by research done by Perkins and Salomon, (1992) who have identified a number of conditions which are required for successful transfer. Two of the most important in the context of transfer of clinical skills include:

- Thorough and extensive practice of the performance in a variety of contexts.
  - Learners' active involvement in self-monitoring to promote skills transfer
- (Perkins & Salomon, 1992).

Students' perceptions of their incompetence in the skills could also relate to issues around cultural competence (Bacote, 1999) which may affect their confidence levels. This may be due to the interplay between language, culture and environmental differences which may affect students' adaptation to a new training institution, the clinical scope of practice i.e. disease profiles. The

cultural adaptation could also relate to students' exposure to a majority of isiZulu speaking patients as opposed to Spanish speakers and the fact that patients in the local setting may differ substantially in their education, knowledge and understanding of their own health and socio-economic status which impact on poor health outcomes.

It is also important to note the difference between the curricula in these settings might have impacted on students' perception of their clinical competence. In Cuba, the theory based curriculum teaches mainly in-ward settings while UKZN emphasises a more practical and problem-based approach in its curriculum. The use of the skills lab and simulated environments from the first year of study would impact on the local students' confidence and often ward based environments offer fewer practice opportunities and less control over clinical exposures as do planned for simulated environments.

Literature shows that medical students tend to perceive themselves as more competent when given the opportunity to practice their skills (Fincher & Lewis, 1994). Coberly and Goldenhar noted that procedural performance correlates well with feelings of competency (Coberly & Goldenhar, 2007). Studies with third year students also revealed that self-assessments of competency are well correlated with frequency of performance of the procedure (Fincher & Lewis, 1994).

The implications of the above might impact on the students' confidence since they are expected by clinical teachers to perform at least as competent as their local peers. In addition, students might be unwilling to expose their lack of practice to address their disadvantage which may cause undue stress in their adaptation. It is also possible that students' self-perception of their competence might not be an objective assessment of their actual ability (Coberly & Goldenhar, 2007).

## **6.4 Recommendations**

It is important to understand the challenges which the SACMC students face upon joining the South African institutions. Local institutions facilitating good remedial programs can assist SACMC students to attain cultural and clinical competence by designing and implementing good remedial programmes which cater for their academic needs. This will ensure that the students are successful

in their studies by addressing emerging problems and help them to graduate within the specified period.

The SACMC programme has delivered training to local disadvantaged students who would not have been admitted to the limited local training institutions with their strict quotas. These students ultimately qualify to practice in the most rural and underserved areas of South Africa. There is thus a great need to enhance and strengthen the SACMC program through better alignment of the curricula between the Cuban and South African settings.

It is therefore recommended that participating schools share information relating to the philosophies and sequence of their training programmes to improve alignment and transferability between training and practice. This will ensure that the intended learning outcomes expected from students in the ultimate practice setting become transparent and attainable.

Students should also be better supported for ease of transition into the local settings. South African universities receiving students from Cuba must therefore plan a well-structured orientation and intervention program in clinical skills to ensure that students receive adequate preparation to successfully complete their studies. This preparation needs to be part and parcel of the SACMC program to ensure that the students are adequately prepared to meet the requirements of the university and the health care needs of the population that they will ultimately serve. Governmental policies between the Cuban and South African governments should also reflect that this has been taken into consideration and adequately implemented.

Intervention programmes should include language and terminology acquisition, such as the learning of isiZulu, (the local national language), the learning of medical terminology in English, ethics of dealing with HIV positive patients and acquisition of more patient centred approaches. The SACMC students have already spent a substantial period in Cuba and have adequate theoretical knowledge and therefore require appropriate supplementation and supervision in the local clinical setting to be adjust to the local South African health care context.

This study only focussed on the SACM students' perceptions of their clinical skills adjustments to the NRMSM. Additional research on the SACMC programme is warranted in terms of the

outcomes of the programme. Do students serve in rural areas after graduation, do they honour their contracts, what are their experiences there in terms of adaptation and what kind of medical care are they delivering in these hospitals? Do they require more supervision during internship and during their medical officer training and many other questions which are vital for the SA government to know regarding the success of the collaboration programme.

## **6.5 Conclusion**

The SACMC program has played a role in training doctors from previously disadvantaged groups with the aim of increasing the supply of doctors to rural areas of South Africa.

The study has highlighted the content and approaches of the clinical training programmes offered in Cuba and at the NRMSM. There is a need to ensure that training be aligned to facilitate students' transition to the locally assigned medical school to complete their medical training. The University of KwaZulu-Natal along with the other seven South African universities needs to guarantee that all the health care professionals that graduate from our institutions will be competent to serve the people of this country.

Further research on the SACMC program including greater collaborations between local universities and Cuban universities would enable academics to correct develop the local remedial program offered and make it more effective in serving the needs of all students.

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# APPENDICES

## Appendix 1: Study information Document

**Title: Exploring the impact of experience-based medical learning on students' clinical preparedness: A case study of the South-African-Cuban medical training collaboration programme at the University of KwaZulu-Natal, South Africa**

Dear Participant

I am, Dr Munira Motala a lecturer at the University of KwaZulu-Natal assigned to the coordination and clinical support of 4<sup>th</sup> year students. I have a particular interest in the improvement of teaching and students' learning on the MBChB programme at the university. To this end, I have been granted permission to explore the educational experiences of students on the program.me.

I have noticed that South African students returning after the Cuban training programme do need additional support when entering the clinical setting. I am therefore specifically interested in your experiences and training during the Cuban –South African collaboration program and the sufficiency thereof to help you face clinical challenges in the local setting. I believe that the research will contribute to our understanding of your challenges when returning to complete the programme in South Africa. A better understanding will allow us to provide more effective support in the future.

To that end, your participation will require

- That you may be asked to complete questionnaires
- That you be interviewed (perhaps more than once)
- Each interview will last about forty-five minutes in length
- The interviews may be audio-taped

If you agree to participate, then your identity will be protected (anonymised) and you have the right to withdraw your participation at any stage.

All data recordings, transcripts and signed consent forms will be stored in safe, locked cupboards, and destroyed after the completion of the study.

Should you require any information, clarification, assistance or details about the ethics of this study you may contact the ethics administrator in the School of Humanities and Social Science (contact details listed below). Additional detail of the study can be obtained from me, or my supervisor (contact details listed below).

Thank you so much in advance for your participation.

Approval No: [HSS/0983/013M](#)

Ethics approval obtained from : HSSREC Research Office contact details:

Ms P Ximba, Tel: 031 260 3587, Email: [ximbap@ukzn.ac.za](mailto:ximbap@ukzn.ac.za)

<u>Researcher name and contact details:</u> <b>Dr Munirah Motala</b> <b>College of Health Sciences</b> Telephone: 0731148021/2603132 <a href="mailto:motalam@ukzn.ac.za">motalam@ukzn.ac.za</a>	<u>Supervisor name and contact details:</u> <b>Dr Van Wyk</b> <b>College of Health Sciences</b> Telephone: 031 260-4336 <a href="mailto:vanwyk@ukzn.ac.za">vanwyk@ukzn.ac.za</a>
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## Appendix 3: Ethical Approval Document



17 September 2013

Dr Munirah Motala (893281499)  
School of Clinical Medicine  
Nelson R Mandela School of Medicine

Protocol reference number: HSS/0983/013M  
Project title: Exploring the impact of experience-based medical learning on students' clinical preparedness: A case study of the South-African-Cuban medical training collaboration programme at the University of KwaZulu-Natal, South Africa

Dear Dr Motala

I wish to inform you that your application has been granted Full Approval.

**Expedited Approval**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

  
.....  
Dr Shenuka Singh (Chair)

/ms

cc Supervisor: Jacky van Wyk  
cc Academic Leader Research: Professor M Mars  
cc School Administrator: Ms D Arumugam

Humanities & Social Sciences Research Ethics Committee  
Dr Shenuka Singh (Acting Chair)  
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Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

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## **Appendix 4: Interview Questions**

### **Semi-structured Interview:**

1. How have your experiences in the clinics, hospitals and community impacted on your learning? Do you think that these experiences offered you sufficient avenues to expand your knowledge, people skills and practice?
2. When were you first exposed to clinical learning? What was the context?
3. Describe what your clinical experiences were like.
4. How were you supervised? Was this adequate to improve your techniques? Who supervised you at the skills lab/clinic/hospital/community?
5. How often were you exposed to bedside teaching?
6. Describe your learning relationship with tutors, professors, doctor and specialists etc.
7. Describe your experience of clinical examinations. Where did they occur and how were they conducted?
8. Did you have adequate time for self-reflection and to improve practice before these marks were recorded or counted towards final marks?
9. Did you receive any feedback, mentorship or support to make sense of your experiences?
10. How can the clinical experiences in Cuba be improved to ensure that you make an easier transition when you join the UKZN medical school?

## Appendix 5: Questionnaire 1

Thank you for participating in this study. Please read the questionnaires below in conjunction with the document titled “Study information and Informed Consent Document”.

Instructions for completing the questionnaires below:

- a. **The questionnaire will be explained by Dr Motala and you are welcome to ask for clarification.**
- b. **Please answer all questions as accurately as possible. Circle the correct answer.**
- c. **Please print your answers clearly with a pen.**
- d. **Please note that all information will be kept completely confidential.**

Section A :	<u>Personal/Biographic Details</u>
Student Number	
Age	
Nationality	
Home language	
Home Province	
Parent's occupation	Mother: Father: No parents/ Deceased/absent parents
How many siblings do you have?	
Where do you fit in the family?	Oldest, middle, youngest
What subjects did you do in your final year at school	

Did you have access to textbooks at school?	Yes	no		
Did you have access to a computer at school	Yes	no		
Did you have access to a computer at home/school?	Home Yes	no no	school yes	no
Did you have access to the internet at school or home ?	Home Yes	no	school yes	no
Were you able to manage your time effectively to study?	Yes	no		
What was your overall class percentage in matric?	Less than 50, 51-60; 61-70;	71-80; 81-90; 91-100		

**Section B: Educational Experience while studying in Cuba**

Generic Skills			Explain for which subject	
Did you do oral presentations in front of your peers and a tutor/lecturer?	Yes	No		
Were you involved in any team based tasks? eg. working in groups with fellow students?	Yes.	No	If yes how common was it to be involved in teamwork? Daily Weekly Monthly	
Did you use resources from the library during your studies?	yes	no		
How often did you go to the library?	3-5 times per week	Less than 3 times per week	Never	
Did you receive training in accessing internet resources?	yes	no		
Did you use textbooks during your studies?	yes	no		
Were these books borrowed from the library?	yes	no	Borrowed from	Bought through

?			friends	bursary
Were you given study notes and lecture material during your studies?	yes	no	Which year/s of study? Year 1 Year 2 Year 3 Year 4	
Did you have an electronic resource website that you could access lecture material? eg moodle	Yes	no		
Did you use the internet to access information on a research topic?	Yes	No		
Did you conduct research projects during your studies in Cuba?	yes	no		
Did you do community projects with local people outside the medical school in Cuba?	yes	no		
Did you do any assignments where you needed to write reports?	yes	no		

What study skills did you use during the last few years of study?			
What time management skills did you use to ensure that you were well prepared for assignments and assessments?			
How did you manage stress while studying and during examinations?			
<b>Curriculum Approach/Content</b>			
Which teaching style was used in Cuba?	Problem based learning/student centred learning	Lecture based through teacher centred learning	Other: please explain
Can you remember your first year subjects in Cuba?	Yes.	No	If yes please list
Can you remember your second year subjects in Cuba?	Yes.	no	If yes please list

Can you remember your third year subjects in Cuba?	Yes.	no	If yes please list
Can you remember what subjects you studied in your fourth year in Cuba?	Yes.	no	If yes please list
Can you remember what subjects you studied in your fifth year in Cuba?	yes	no	If yes please list
Where did you spend most of your academic time in your final year in Cuba?	At university At clinics At hospitals other	Please explain.	
At this stage, do you think that you have a good knowledge and understanding of common diseases in South Africa like TB, HIV and other infectious diseases for future practice?	yes	no	If no , please explain

## Appendix 6: Questionnaire 2

### Clinical Examination Skills Questionnaire 2:

**Instruction: With reference to the skills listed on the left, indicate your responses in the appropriate column. Column A needs you to answer yes or no.**

**For all the remaining columns indicate your response by answering A, B, C or D or all that apply**

	<b>Column a</b>	<b>Column b</b>	<b>Column c</b>
	<p><b>Answer yes or no</b></p> <p><i>If <u>No</u> then move on to the next question.</i></p> <p><b>Were you taught this skill?</b></p>	<p>What setting/format was used in the teaching?</p> <p>a. Lecture b. Ward c. Laboratory d. All of the above</p>	<p>How well can you perform this skill</p> <p>a. Independently b. With supervision c. With revision d. Not at all</p>
<b>Adult Physical Examination:</b>			
1. General examination			
2. Cardiovascular			
3. Respiratory			
4. Abdominal			
5. Neurological			
6. Obstetrical			
7. Gynaecological			

8. Neck and Thyroid examination			
9. Examination of the male external genitalia			
	<p>Were you taught this skill?</p> <p>Answer yes or no. If No then move on to the next question.</p>	<p>What setting were you taught in?</p> <p>A Lecture B Ward C Laboratory D All of the above</p>	<p>What level can you perform this skill</p> <p>A Independently B With supervision C With revision D Not at all</p>
10. Rectal examination			
<b><u>Newborn Examination</u></b>			
11. General examination of the newborn			
<b><u>Radiological examinations</u></b>			
12. CXR			
13. Abdominal XR			
14. XR Bones and Joints			
<b><u>Specimen Collection</u></b>			

15. Fungal scrapes			
16. Wound swabs			
	<p>Were you taught this skill?</p> <p>Answer yes or no.</p> <p>.</p> <p>If No then move on to the next skill.</p> <p>If yes please answer the next 3 questions</p>	<p>What setting were you in, when you were taught the skill?</p> <p>A Lecture</p> <p>B Ward</p> <p>C Laboratory</p> <p>D All of the above</p>	<p>At What level can you perform this skill?</p> <p>A Independently</p> <p>B With supervision</p> <p>C With revision</p> <p>D Not at all</p>
17. Blood culture			
18. Nasal and throat swab			
19. Urine and stool specimen			
20. Gastric washings			
21. Sputum collection			
22. Pus aspirate			
23. Pus swabs			
24. Urine collection (mid-			

stream urine, catheter specimen urine)			
25. Use of urine dipstick			
<b><u>Obstetric and Gynae procedures</u></b>			
	<p>Were you taught this skill?</p> <p>Answer yes or no. If No then move on to the next question.</p>	<p>What setting were you in, when you were taught the skill?</p> <p>A Lecture B Ward C Laboratory D All of the above</p>	<p>At what level can you perform this skill?</p> <p>A Independently B With supervision C With revision D Not at all</p>
26. Pap smear and plating of smear			
27. Speculum insertion			
28. Mechanism of labour and delivery- using the model			
<b><u>Airway management procedures</u></b>			
29. Insertion of oropharyngeal airway			
30. Cricoid pressure			
31. Suctioning of airway			

32. Bag –valve mask reservoir ventilation			
33. Orotracheal intubation			
34. Oxygen administration			
	<p>Were you taught this skill?</p> <p>Answer yes or no. If No then move on to the next question.</p>	<p>What setting were you in, when you were taught the skill?</p> <p>A Lecture B Ward C Laboratory D All of the above</p>	<p>At what level can you perform this skill?</p> <p>A Independently B With supervision C With revision D Not at all</p>
35. Use of nasal cannulae			
36. Use of laryngeal mask airway			
37. Use of face masks			
<b><u>Asthma adjuncts</u></b>			
38. Peak flow meter			
39. Metred dose inhaler			

40. Spacer devices			
41. Nebulisation			
<b><u>Procedures</u></b>			
	<p>Were you taught this skill?</p> <p>Answer yes or no. If No then move on to the next question.</p>	<p>What setting were you in, when you were taught the skill?</p> <p>A Lecture B Ward C Laboratory D All of the above</p>	<p>At what level can you perform this skill?</p> <p>A Independently B With supervision C With revision D Not at all</p>
42. Rapid cholesterol test			
43. Glucogel administration			
44. Administration of 50% dextrose			
45. Haemoglucotest			
46. Measuring body temperature			

47. Rapid Hiv test			
48. Mantoux			
49. 12 lead ECG			
	<p>Were you taught this skill?</p> <p>Answer yes or no. If No then move on to the next question.</p>	<p>What setting were you in, when you were taught the skill?</p> <p>A Lecture B Ward C Laboratory D All of the above</p>	<p>At what level can you perform this skill?</p> <p>A Independently B With supervision C With revision D Not at all</p>
50. Infant anthropometry ( wt and length , ofc infant.)			
51. Adult Anthropometry ( body mass index, skin fold thickness (triceps,biceps,scapular), mid-arm circumference, waist to hip ratio , )			
52. Peripheral IV cannulation			
53. Insertion of central venous line			
54. Lumbar puncture			
55. Spinal block			

56. Nasogastric tube insertion			
57. Blood collection			
58. Urinary catheterisation			
<b><u>Resuscitation</u></b>			
	<p>Were you taught this skill?</p> <p>Answer yes or no. If No then move on to the next question.</p>	<p>What setting were you in, when you were taught the skill?</p> <p>A Lecture B Ward C Laboratory D All of the above</p>	<p>At what level can you perform this skill?</p> <p>A Independently B With supervision C With revision D Not at all</p>
59. One man CPR for an adult, child, infant			
60. Preparation and attachment of 3 lead ECG monitoring equipment			
61. Automated external defibrillation			
62. Defibrillator			

63. Neonatal resuscitation			
64. Recognition of cardiac arrest arrhythmias			

**Instruction: With reference to the communication skills listed on the left, indicate your responses in the appropriate column. Column A needs you to answer yes or no. For all the remaining columns indicate your response by answering A, B, C, D, E or all that apply**

	Column a	Column b	Column c	Column d
	Were you taught this skill? Answer yes or no. If No then move on to the next question.	What setting were you in, when you were taught the skill? A Lecture B Ward C Laboratory D All of the above	At what level can you perform this skill?  A Independently B With supervision C With revision D Not at all	Are you able to perform this skill in: A Spanish B English C Both
<b><u>Communication Skills</u></b>				
65. Approach to communication				
66. General history taking				
67. Cardiovascular history				
68. Respiratory history				
69. Gastrointestinal history				
70. Neurological history				
71. Obstetrical history				

72. Gynaecological history				
73. Urinary history				
74. Bereavement counselling/breaking bad news				
75. Counselling of HIV positive patient (Pre and Post-test counselling)				