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THE WORKPLACE AS A TEACHING AND LEARNING ENVIRONMENT FOR UNDERGRADUATE MEDICAL EDUCATION IN UGANDA

by

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**Thesis Submitted in Fulfillment of the requirements for the award of the
Degree of Philosophiae Doctor in Health Professions Education (Ph.D. HPE)
in the
Division Health Sciences Education,
Faculty of Health Sciences
at the University of the Free State**

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Jan 2018

DECLARATION

I hereby declare that the work submitted in this thesis is the result of my own independent investigations. During the course of this work, I have used previous research resources which I have cited responsibly giving credit to the authors of my sources. I have acknowledged the people who have assisted me in pursuit of the investigation. I further declare that this work is being submitted for the first time at this university/faculty/division for the award of the degree of Philosophiae Doctor in Health Professions Education (Ph.D. Health Professions Education) and that it has never been submitted to any other university or institution for purposes of obtaining a degree. I also declare that the information obtained from the study participants was treated and will continue to be treated with utmost confidentiality as recommended by research ethics.

26th January, 2018

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Dr Mike N. Kagawa   **Date**

Principle Investigator

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Dr. Mike N. Kagawa   **Date**

DEDICATION

This PhD thesis is dedicated to my parents: My dad, Mr JS Nantamu Gandi, and my late mum, Mrs Robinah HL Nantamu. They have been my inspiration all the way and have always encouraged me to go a step further.

My dad, for his commitment to ensuring that we all have an education inspite of his limited resources.

My mum, for inspite of having so little, gave us so much such that
ALL THAT I AM, IS BECAUSE SHE WAS.
She was always there, wishing us all the best and celebrating all our achievements.
And she will always be.

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mind all this time, and will linger on for a long time, in this seemingly lonely journey of Health Professions Education; "Are you sure you are talking to the right audience?".

- My siblings, who have been supportive of my academic journey, from the time we were young. Herbert lead the way, Max always shared his pencils and pens with me, Marion and Diana looked up to me for inspiration, which meant I dared not disappoint them.

- My family: my wife Rachel, who encouraged me from the start of this PhD journey, when I had no sponsorship and no idea where the money would come from. She assured me that, through prayer, God will make a way, where there seems to be no way, and indeed He has. My children; Jonathan the Captain and Jewel the Princess who expected toys and presents whenever I went to 'the aeroplane', and Jason, the Bubu who would sit in my suitcase, wanting to go with me whenever I packed to travel away from home.

I acknowledge you all with my heart.

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LIST OF ACRONYMS

ASP	**Academic self-perception**
DREEM	**Dundee Ready Education Environment Measure**
ENT	**Ear, Nose and Throat**
FAIMER	**Fundation for the Advancement of International Medical Education & Research**
FGD	**Focus Group Discussions**
ICT	**Information and Communication Technology**
IRB	**Institutional Review Board**
KII	**Key Informant Interviews**
MakCHS	**Makerere University College of Health Sciences**
MBChB	**Bachelor of Medicine and Bachelor of Surgery**
MCQ	**Multiple Choice Question**
MNRTH	**Mulago National Referral and Teaching Hospital**
MOSG	**Medical Officer Special Grade**
MUST	**Mbarara University of Science and Technlogy**
Obgyn	**Obstetrics and Gynaecology**
OSCE	**Objective Structured Clinical Examination**
PoA	**Perceptions of atmosphere**
PoL	**Perceptions of learning**
PoT	**Perceptions of teachers**
SAFRI	**Sub-Saharan Africa FAIMER Regional Institute**
SBME	**Simulation-Based Medical Education**
SSP	**Social self-perception**
UFS	**University of the Free State**
U-Zim	**University of Zimbabwe**

DEFINITION OF TERMS

The terminology and definitions used in this thesis are adopted from various sources that are acknowledged below:

Blooms taxonomy   This is a model designed by Christopher Bloom that classifies educational activities into a heirachical pattern of increasing complexity during competence development and can be classified into cognitive, affective and psychomotor domains. This model can be used by medical educators to write learning objectives that describe the skills and abilities that the learners should master and demonstrate during training (Adams 2015:152; Austin 2016:online).

Delphi   The Delphi technique is a structured communication scientific method aimed at producing a detailed critical examination and discussion, through iterations among experts in a particular field, that enables effective expression of individual assessments, upon which convergence of opinion among experts on a particular subject can be achieved (Green AR 2014:online)

Ecology of education   This refers to the policies, people, places, traditions, economic and political conditions, institutions and relationships that affect education or that it affects (Weaver-Hightower 2008:153).

Interpretivism   This is subjective epistemological stance which anticipates multiple, diverse interpretations of reality rather than an overarching 'truth', and is associated with an interpretive effort to gather a range of in-depth accounts with the aim of building a detailed picture of how a particular phenomenon is understood by those who have personal experience of it (Bunniss & Kelly 2010:358).

Learner agency   The intentionality and actions that mediate and shape learner participation or willingness to engage and seek the guidance necessary to support his or her participation in the learning activities (Chen, Cate, O'Sullivan, Boscardin, Eidson-Ton, Basaviah & Teherani 2016:203).

Miller's pyramid   This is a framework designed by George E. Miller for assessing clinical competence in medical education and can assist clinical teachers in matching clinical competencies with expectations of what the learner should be able to do at any stage (Miller 1990:S63; Ramani & Leinster 2008:347).

Paradigm   This refers to the epistemological assumptions or framework containing the basic assumptions underpinning the way of thinking and methodology employed by an investigator or group of investigators during research (Bunniss & Kelly 2010:358).

Workplace learning   This refers to how medical students learn in workplaces or medical practice settings, where learning is mediated by the relationships between learners, peers, more experienced practitioners, other health professionals, and patients (Dornan 2012:15)

ABSTRACT

Introduction: Significant changes are taking place in health care delivery due to new health system expectations, clinical practice requirements and staffing arrangements. Contemporary medical education has also undergone major changes, from being characterised by traditional, teacher-controlled approaches, to newer approaches that involve student-directed learning, problem-based learning, the use of skills laboratories, and evidence-based medicine. These changes have important implications for the way medical students are prepared to provide quality health care once they qualify. It is not clear, however, whether clinical education at the workplace at Mulago National Referral and Taeching Hospital (MNRTH), Kampala, Uganda, has kept pace with or been responsive enough to these changes.

The purpose of this study was to assess the suitability of a workplace, such as MNRTH in Kampala, Uganda, as a teaching and learning environment, by determining whether it fulfilled the requirements of the curriculum for undergraduate medical students of Makerere University College of Health Sciences (MakCHS), with the ultimate aim of generating recommendations for improving teaching and learning at the workplace so as to produce graduates who are responsive enough to the contemporary demands of medical practice, research and training.

Research design: The study design was cross-sectional descriptive study with a mixed-methods approach. A mixed methods approach was adopted because of the complex nature of health and educational services research – neither a quantitative nor qualitative approach alone would have been sufficient to address this complexity.

Using an interpretivist lens, the mixed methods approach explored the processes (curriculum), context (workplace), and experiences and perceptions of the stakeholders in their natural settings and variety; these elements are essential for the interpretive analysis of the interaction between the teaching and learning environment and the undergraduate medical curriculum at MakCHS.

The methods used comprised a document review of the undergraduate curriculum to provide context, a self-administered questionnaire (adapted from the DREEM) and focus group discussions with undergraduate medical students, key informant interviews with

administrators and teachers of undergraduates and a Delphi process to generate recommendations for improvement of the workplace as a teaching and learning environment.

Results: The results of the document review indicated that the curriculum had clearly stated learning objectives, and used appropriate verbs in accordance with Bloom's taxonomy. The expectations of the curriculum were also in accordance with Miller's pyramid of competence development for the different student levels.

The administrators, teachers and students perceived the workplace as both enabling and challenging and listed a number attributes that could facilitate or hinder the implementation of the undergraduate curriculum. The positive perception was premised on the availability, and variety of and accessibility to patients, thus creating authentic learning opportunities. The negative perceptions centred on overcrowding by both students and patients at the workplace, shortage of equipment and supplies, inadequate ICT facilities and poor social services. The teachers were perceived to be knowledgeable, though they exhibited certain deficiencies regarding their clinical teaching skills, as they did not offer students adequate opportunities for supported participation or practice with patients. The students, therefore, perceived and recommended that the teachers were in need of further training. On the other hand, the teachers perceived the students as lacking in learner agency – the intentionality and enthusiasm to learn.

Conclusions: Implementation of the undergraduate curriculum could be facilitated at the workplace by enabling factors and positive attributes perceived by the stakeholders, such as availability and variety of patients that were accessible, which create authentic learning opportunities and therefore lead to the production of competent graduates.

The challenges that created the negative perceptions need to be addressed by focussing on the specific areas of concern raised in order for the workplace to be supportive of teaching and learning. The challenges, though real, were considered by some key informants as reality checks that encourage students to be resilient and innovative in the face of shortages that were representative of the clinical practice settings that the students will be faced with when they qualify and, therefore, created medical practitioners that were fit for purpose.

In an attempt to address the challenges identified, and create a positive perception of teaching and learning at the workplace, a three-phase Delphi survey was designed, which yielded 30 recommendations which, in the opinion of medical education experts, if adopted and implemented could lead to improvement in teaching and learning at the workplace at MNRTH and ultimately lead to the training of competent health professionals who can meet the demands of contemporary medical practice, research and training.

CHAPTER 1

ORIENTATION OF THE STUDY

1.1 INTRODUCTION

In this research project, the researcher did an in-depth study with a view to assessing whether a workplace, such as Mulago National Referral and Teaching Hospital (MNRTH) in Kampala, Uganda, was a suitable teaching and learning environment, by determining whether it fulfilled the requirements of the curriculum for undergraduate medical students of Makerere University College of Health Sciences (MakCHS). The study was carried out at MNRTH and MakCHS. These two institutions (the Hospital and the College) have parallel administrative structures (administrators). The top management of the Hospital comprises a director, who is the chief executive officer, the deputy director and the principal hospital administrator. The College management involves a college principal, as the chief executive officer, a deputy principal and a college academic registrar. The college consists of four schools, namely, School of Medicine, School of Biomedical Sciences, School of Health Sciences and School of Public Health, with each being headed by a dean and an academic registrar.

The undergraduate medical curriculum at MakCHS is a competency-based curriculum. The aim of the curriculum is to produce medical graduates with competencies in the following domains: medical knowledge, clinical skills and patient care, critical inquiry and scientific method, professionalism and ethical practice, interpersonal and communication skills, leadership and management skills, population health, continuous improvement of care through reflective practice, and health systems management. With regard to its implementation, the curriculum is structured as three phases, which spiral into each other.

The results of the study may serve to provide insight into the strengths, weaknesses, opportunities and challenges of teaching and learning in the workplace, and the recommendations generated from a Delphi study may be used as templates for improving teaching and learning of undergraduate medical students at the workplace for, in order to produce health professionals who are responsive to the contemporary demands of society. While providing a permanent solution to all the challenges of teaching at a workplace such

as MNRTH may not be possible, relevant stakeholders may use the critical reviews of the study findings as a framework for improving performance of their tasks.

The aim of this chapter is to orientate the reader to the study. The background, the problem statement, overall goal and aim of the study, research questions and study objectives are presented. This information is followed by the demarcation of the study, and an explanation of the significance and value of the study. Thereafter, a brief overview of the research design, paradigm and methods of investigation is presented, followed by a brief description of the conceptual framework. At the end of the chapter, the layout of the rest of the chapters is presented, with a short summary of each.

1.2   BACKGROUND

In studying a workplace such as MNRTH as a teaching and learning environment, the researcher makes reference to the interrelated factors that constitute the ecology of education. For workplace learning to be effective, and with reference to the various elements of the learning ecology, the curriculum should be designed well, with proper learning objectives and learning tasks that vary in nature and complexity, depending on the level of the students. The learning environment and its culture, or hidden curriculum, should offer adequate patient numbers and a case mix, infrastructure to ensure the privacy of patients, and learning aids, such as skills laboratories, a library and facilities for information and communications technology (ICT). The format of instruction should be well articulated, with matching assessment methods. Another requirement is organisational rules and regulations that ensure specific, protected time and space for teaching and learning. There should be guidelines and regulations on how to select teachers with the right qualifications, and students with backgrounds that ensure convergence in goal and purpose of both teachers and students towards clinical medicine, and a mechanism of evaluation with consequences for non-performance by both teachers and students (Ringsted, Hodges & Scherpbier 2011:695).

A workplace for the practice of medicine can act as a teaching and learning environment for clinical medicine. Advances in medical education around the world have led to the establishment of clinical skills laboratories as places for teaching clinical skills using simulation-based medical education (Akaike *et al*. 2012:28). However, even after acquiring clinical skills in a laboratory, students might not be considered competent until they have

shown that they can translate the skills learnt in the skills laboratory to the real-patient situation. Real patients provide unique experiences for students. Real patients present with physical signs symptoms and explain their problems with deeper and broader insight while they tell the stories of their afflictions, than simulated patients in the skills laboratory would. Workplace learning is important, because practice is learnt by practising (Dornan 2012:15). "Passing the examination of clinical procedure and competency using simulation cannot be an end in itself for medical students as simulation is not equal to reality" (Bradley, 2006:254). Miller's pyramid can be used to assess clinical competence and determine what the student should be able to do at any stage (Miller 1990:S63). The **"does"** level of Miller's framework, which is the highest, assesses professional competence in daily patient care. Assessment requires that students, while working with real patients, demonstrate competence while they are being observed by the teacher in the clinical setting (Ramani & Leinster 2008:347).

1.3   PROBLEM STATEMENT

The problem that was addressed by this study was whether a workplace, such as MNRTH, fulfils the requirements of the undergraduate medical curriculum at MakCHS. Although studies have been done on the workplace as a teaching and learning environment, these studies were done in other contexts, such as the United Kingdom, Finland, Taiwan and Hong Kong (Browne 2007:113; Chan 2001:447; Papp, Markkanen & Von Bonsdorff 2003:262). A recent study, which examined the intricate relationship between MNRTH and MakCHS focused on the administrators and teachers, and did not examine other factors, such as the curriculum and the students which could have important implications for teaching and learning at the workplace (Mubuuke, Businge & Mukule 2014:249). Furthermore, the study did not investigate using consensus-building among role players and experts involved in teaching and learning in the workplace to develop recommendations for improvement.

Health system expectations and clinical practice requirements have changed significantly over time. For instance, regarding patients, there are changes in numbers, expectations, demographics and level of education, income and employment. The health system and the health workforce is struggling to keep up with these changes, and this has important implications for the preparation of medical students to provide quality health care services upon graduation. Concerns that graduate competencies and patient/population needs are

mismatched, may be an indictment on the pace of health professions education in relation to expectations of, and changes in health care delivery (Frenk *et al*. 2010:1923).

One of the ways to address this mismatch is to understand the interaction between the expectations of the curriculum and the capacity of the training platform. This has particular relevance for MakCHS, since the undergraduate medical curriculum is competency based, and the students are expected to acquire clinical competence at the workplace, that is at MNRTH.

According to the ecology of education, making the workplace a suitable teaching and learning environment requires an understanding of the various, interrelated factors involved (Ramani & Leinster 2008:347). One of the challenges of using the workplace as a teaching and learning environment is the need for the teacher to strike a balance between the students' needs and patients' rights, as well as the needs of the clinical workload, research and students' learning. This challenge is often compounded by an ever-increasing number of patients and students, as well as inadequate resources such as space, equipment and supplies, library resources at the workplace and limited knowledge and facilities for ICT (Gorman, Meier, Rawn & Krummel 2000:353; Hovenga 2000:3). Demonstration of competency by students requires a balanced integration of basic science knowledge, clinical skills and appropriate attitude, which is achieved best at the workplace, where the skills that have been acquired will be applied in professional practice in the future.

No recent studies focussing specifically on the interaction between the curriculum and the workplace as a teaching and learning environment for undergraduate medical education could be found. Therefore, it was considered important to understand the suitability of a workplace, such as MNRTH, as a teaching and learning environment and to generate recommendations for improvement; thus, optimising teaching and learning and producing medical graduates who are responsive to the demands of contemporary medical practice, research and training.

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

i. *What are the requirements of the undergraduate medical curriculum at MakCHS during student placement in the workplace at MNRTH?*

ii. *How does a workplace, such as MNRTH, as teaching and learning environment, fulfil the requirements of the undergraduate medical curriculum from the perspectives of the administrators, teachers and students?*

iii. *What recommendations can be made for improvement of teaching and learning at the workplace for undergraduate medical students?*

1.4 OVERALL GOAL, AIM AND OBJECTIVES

In order to address the problem, the following aspects of the study are described: overall goal, aim and objectives of the study.

1.4.1 Overall goal of the study

The overall goal of the study was to understand the interaction between the undergraduate medical curriculum of MakCHS and a workplace, such as MNRTH, as a teaching and learning environment, and to generate recommendations for improvement that may be adopted by the National Council for Higher Education in Uganda as templates for improving teaching and learning in the workplace for medical students.

1.4.2 Aim of the study

The aim of the study was to assess the suitability of a workplace, such as MNRTH, as a teaching and learning environment for undergraduate medical students' curriculum at MakCHS.

1.4.3 Objectives of the study

To achieve this aim, the following objectives were pursued:

- To examine the requirements of the undergraduate medical curriculum at MakCHS during the students' placement in the workplace at MNRTH;
- To determine how, from the administrators', teachers' and students' perspectives, the workplace at MNRTH, as teaching and learning environment, fulfils the requirements of the undergraduate medical curriculum;

- To generate recommendations for improving teaching of and learning by undergraduate medical students at the workplace at MNRTH; and
- To generate recommendations for efficient teaching and learning in the workplace at MNRTH for undergraduate students in health sciences education.

1.5   DEMARCATION OF THE FIELD AND SCOPE OF THE STUDY

The study fits in the field of health professions education, because it explored pertinent issues of teaching and learning in the workplace that are central to the development and assurance of congruence between competence of medical graduates and the needs of the population. Due to the application of the study in the field of health professions education and various medical disciplines involved, the study can be classified as multidisciplinary. In addition, the study is located in the field of higher education. In Uganda, specifically, the National Council for Higher Education may apply the findings of the study as guidelines and standards for accrediting medical schools and the hospitals where they intend to train medical students, as well as for benchmarking teaching and learning environments offered by medical schools in the country.

Although the main study site was MNRTH and MakCHS, participants from other medical schools in Uganda, namely, Mbarara University of Science and Technology, Busitema University, Gulu University and Kampala International University, as well as other selected medical schools in other parts of Africa, were invited to participate in the Delphi study as experts in medical education.

From a personal context, the researcher is a qualified lecturer at MakCHS. He holds a Bachelor's degree in Medicine and Surgery (MBChB) and Master's degree in Obstetrics and Gynaecology (MMed-Obs&Gyn) from Makerere University, as well as a Fellowship in Medical Education from the Sub-Saharan Africa FAIMER Regional Institute (SAFRI). After studying at MakCHS and attending the Fellowship in Medical Education at SAFRI, reading literature about teaching and learning in medical education, and working as a teacher at MakCHS while teaching and observing what happens at the MakCHS, the researcher identified a gap in information about the workplace in the hospital as a teaching and learning environment for undergraduate medical students, and this realisation led to the conceptualisation of this study.

The study was conducted between January 2015 and December 2017, with the empirical research phase (data collection) taking place from October 2015 to the end of August 2017.

1.6   SIGNIFICANCE AND VALUE OF THE STUDY

The medical education landscape changes continually. A great deal of new information and new technologies are now available, and these days the emphasis is on student-directed approaches and evidence-based medicine, as opposed to the traditional teacher-controlled approaches of the past (Normak, Pata & Kaipainen 2012:262). The expectations and desires of not only patients, but the health system too, have changed, and the health system and the health workforce struggles to keep up with these changes. There is a lack of information about the suitability of the workplace at MNRTH as a teaching and learning environment and whether it fulfills the requirements of the undergraduate medical curriculum in terms of learning objectives, learning opportunities, teaching and assessment methods, composition of learning environments, and availability of learning resources. The researcher trusts that the information obtained from the study findings will provide insight into the strengths, weaknesses, opportunities and challenges of teaching and learning at this particular workplace. The recommendations generated by the Delphi survey will be used as templates for improving teaching of and learning by undergraduate medical students at the workplace, so that health professionals who are responsive to the contemporary demands of society can be produced. While it is unlikely that a permanent solution to all the challenges of teaching and learning at the workplace at MNRTH will be provided, relevant stakeholders may use the critical reviews of these study findings as a framework to improve the performance of their tasks.

1.7   RESEARCH DESIGN OF THE STUDY AND METHODS OF INVESTIGATION

1.7.1   Design of the study

The study followed a cross-sectional descriptive design. A mixed-methods approach that adopted both qualitative and quantitative methods was used to examine the interaction between the undergraduate medical curriculum at MakCHS and the workplace at MNRTH as a teaching and learning environment. The details of the study design are described in Chapter 3.

1.7.2   Paradigm

The philosophy on which the predominantly qualitative research paradigm of this study was based is that, in order to gain knowledge about a phenomenon, engagement in dialogue with the people who constitute the phenomenon of interest is necessary. This dialogue with the people can take the form of reading what they write, watching what they do, joining them in their day-to-day interactions, or talking to them (Bergman *et al*. 2012:545; Pope & Mays 1995:42). The qualitative approach used by this study emphasised the context (workplace), processes (curriculum), experiences and perceptions of all stakeholders in their natural settings and diversity at MNRTH and MakCHS. These components were considered essential for the interpretive analysis of the teaching and learning environment of the undergraduate medical curriculum.

1.7.3   Methods of investigation

The methods used comprised a document review, key informant interviews, self-administered questionnaires, focus group discussions and a Delphi process. The study was conducted in three phases. Phase 1, the document review, was a prerequisite for the next two phases. Phase 2 involved key informant interviews with administrators and teachers, and involving students in focus group discussions and a self-administered questionnaire (the Dundee Ready Education Environment Measure, DREEM). Phase 3 was a Delphi survey with medical education experts; national and international experts were consulted, and their contributions were used to generate consensus on how to improve teaching and learning in the workplace. A schematic overview of the study is given in Table 1.1.

TABLE 1.1: SUMMARY OF DATA COLLECTION METHODS FOR THE VARIOUS TARGET POPULATIONS

DATA SOURCE/ PHASE	CURRICULUM	ADMINISTRATORS	TEACHERS	STUDENTS		MEDICAL EDUCATION EXPERTS
Phase 1	Document review					
Phase 2		Key informant interviews		DREEM	FGD	
Phase 3		Delphi survey for generating consensus on recommendations for improvement				

Key: FGD=Focus group discussion DREEM=Dundee Ready Education Environment Measure

1.7.3.1 *Phase 1*

In Phase 1 the first objective, namely, to examine the requirements of the undergraduate medical curriculum at MakCHS during the students' placement at the workplace at MNRTH, was addressed. A thorough **document review** of the undergraduate curriculum was done. Reference was made to authoritative documents on medical education, such as the Flexner Report (Duffy, 2011), the CanMEDS (Frank, 2005), the Lancet Commission Report (Frenk *et al*. 2010:1923), and the Health Professions Council of South Africa document that outlines the core competencies required of undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa. The main purpose of this document review was to develop understanding of the MakCHS undergraduate medical curriculum, provide background and context, and discover insights relevant to the study. Information from this document review was used to generate discussion points for the interviews with the administrators, teachers and students. The purpose of the document review was not to provide a complete picture of the actual teaching and learning experienced by teachers and students at the workplace, but to provide valuable insights into the curriculum expectations for undergraduate medical education at MakCHS.

1.7.3.2 *Phase 2*

Phase 2 addressed the second objective of the study, which sought to determine how, from the administrators', teachers' and students' perspectives, the workplace at MNRTH, as teaching and learning environment, met the requirements of the undergraduate medical curriculum. A critical appraisal was performed of the perceptions and experiences of stakeholders in relation to the strengths, opportunities, challenges and weaknesses of the workplace at MNRTH as a teaching and learning environment. In this phase, several data collection methods were utilised: data was collected from the administrators and teachers using **key informant interviews,** and from students by using an adapted DREEM questionnaire (Whittle, Whelan, & Murdoch-Eaton 2007:online) and **focus group discussions**.

1.7.3.3 *Phase 3*

In Phase 3, the third objective, namely, to generate recommendations for improving teaching of and learning by undergraduate medical students at the workplace was

addressed. The Delphi method, which is a scientific technique for achieving convergence of opinions on a particular issue, was applied. While most common survey techniques try to answer the question of "what is", the Delphi method attempts to answer the question, "what should be" (Hsu & Sandford 2007:online; Ludwig 1997:online). As an iterative method for consensus building among stakeholders, it was well suited for generating recommendations to improve teaching for and learning by undergraduate medical students at the workplace.

The results of Phases 1 and 2 were used to generate recommendations, which were listed under various subheadings to form the first round of the Delphi questionnaire. The Delphi survey comprised three rounds of consensus-seeking for generating recommendations for improving teaching and learning at the workplace.

A detailed description of the study populations, selection criteria, sampling methods, data collection methods and analysis techniques as well as reporting and ethical issues will be provided in Chapter 3.

1.8 THE CONCEPTUAL FRAMEWORK

A central component of this study was the interaction between the workplace (as a teaching and learning environment) and the undergraduate medical curriculum. Experiences and perceptions of the different stakeholders, such as administrators, teachers and students, regarding the suitability of the workplace as a teaching and learning environment, were explored. A detailed discussion and diagrammatic representation of the conceptual framework will be given in Chapter 2, the literature review.

1.9 IMPLEMENTATION OF THE FINDINGS

The findings of the research will be shared with interested and influential stakeholders at MakCHS and MNRTH. Other beneficiaries may be other health professions training institutions in Uganda and beyond. The recommendations may also be adopted by the Uganda National Council for Higher Education, as templates and models that can be used by medical schools to set guidelines and standards for teaching and learning environments at the workplace.

The researcher will submit the research findings for publication in academic journals with the aim of making a contribution to knowledge about teaching and learning in the workplace. Furthermore, the research findings will be shared at conferences in an effort to disseminate them widely.

1.10   ARRANGEMENT OF THE STUDY

The study will be reported in the following format, to provide the reader with useful insights into the topic of study, methods used and the study findings.

Chapter 1, **Orientation of the study**, stated the study problem and justification, together with the research questions. The overall goal, aim and objectives were presented. The research design and methods used for data collection and analysis were discussed briefly, to give the reader insight into what to expect. Furthermore, the demarcation of the field and scope, as well as the significance of the study for teaching and learning at the workplace, were described.

Chapter 2, Literature review on the workplace as a teaching and learning environment, will describe the conceptualisation and contextualisation of the undergraduate curriculum, the teaching and learning environment, as well as the different role players, namely, administrators, teachers and students. Also of note in this chapter is a discussion of the conceptual framework of the study.

Chapter 3, Research design and methodology, will discuss the research design, paradigm and methods applied for each phase of the study, in detail. The study setting and methods will be described for each phase, focussing on the study populations, selection criteria, sampling methods, data collection procedures and analysis techniques. The Delphi technique that was used to generate consensus on recommendations for improving teaching and learning at the workplace will be described. The focus of this description will be on survey tool development, expert panel selection, method of survey tool delivery to the participants and number of survey rounds, as well as a definition of consensus.

Chapter 4, Results and discussion; the document review, will present the results of the document review of the undergraduate curriculum and its supporting documents, such as the training schedules. The justification for the document review, a summary of

procedures and the results will be discussed. The results will be presented in relation to the learning objectives and five tracer domains selected from the nine domains of competence for teaching and learning of undergraduates of MakCHS. Specific reference will be made to Bloom's taxonomy and previous literature.

Chapter 5, Results and discussion, presents **the clinical learning environment as perceived by the students**. The perceptions of the students, which were obtained using a validated clinical learning environment questionnaire (DREEM), which had been adapted to suit the study area, and through focus group discussions with students, will be presented as visual displays, and quotes will be provided to support the findings. These findings will be compared to findings from other studies.

Chapter 6, Results and discussion, presents **the clinical learning environment as perceived by the administrators, teachers *and students.*** In this chapter, the findings from key informants, who shared their perceptions and experiences about teaching and learning at the workplace, will be presented as quotes under the themes that emerged from the interviews. The key informants were administrators and teachers of undergraduates at MakCHS (both lecturers from MakCHS and specialists from MNRTH) who were interviewed by the research team.

Chapter 7, Results and discussion, presents **a contributions chapter, the Delphi survey*.*** An exposition of the Delphi survey, its process, the participants and the recommendations generated, will be presented. The Delphi survey was administered to experts in medical education who were selected from MakCHS, MNRTH, three medical schools at other universities in Uganda, and two other African university medical schools.

Chapter 8, Conclusions, recommendations and limitations of the study, will present an overview of the study, and the conclusions and recommendations from the various components of the study. A discussion of the study strengths and limitations as well as areas for further research will be presented.

1.11   CONCLUSION

Chapter 1 provided an orientation to the research, which dealt with the workplace as a teaching and learning environment at MNRTH. A brief background, the problem statement,

the goal, aim and objectives of the study were provided, as were a brief description of the design, paradigm and conceptual framework. A summary of the arrangement of the study, outlining the various chapters and their contents, was included. The next chapter will involve a discussion of relevant literature regarding the workplace as a teaching and learning environment.

CHAPTER 2

LITERATURE REVIEW: THE WORKPLACE AS A TEACHING AND LEARNING ENVIRONMENT

2.1 INTRODUCTION

In this chapter a conceptualisation and contextualisation of the workplace as a teaching and learning environment is provided, with the focus on the following thematic areas:

- The ecology of education;
- The ecology of medical education;
- Workplace learning;
- The undergraduate medical curriculum;
- Teaching and learning at Makerere University College of Health Sciences; and
- Conclusions.
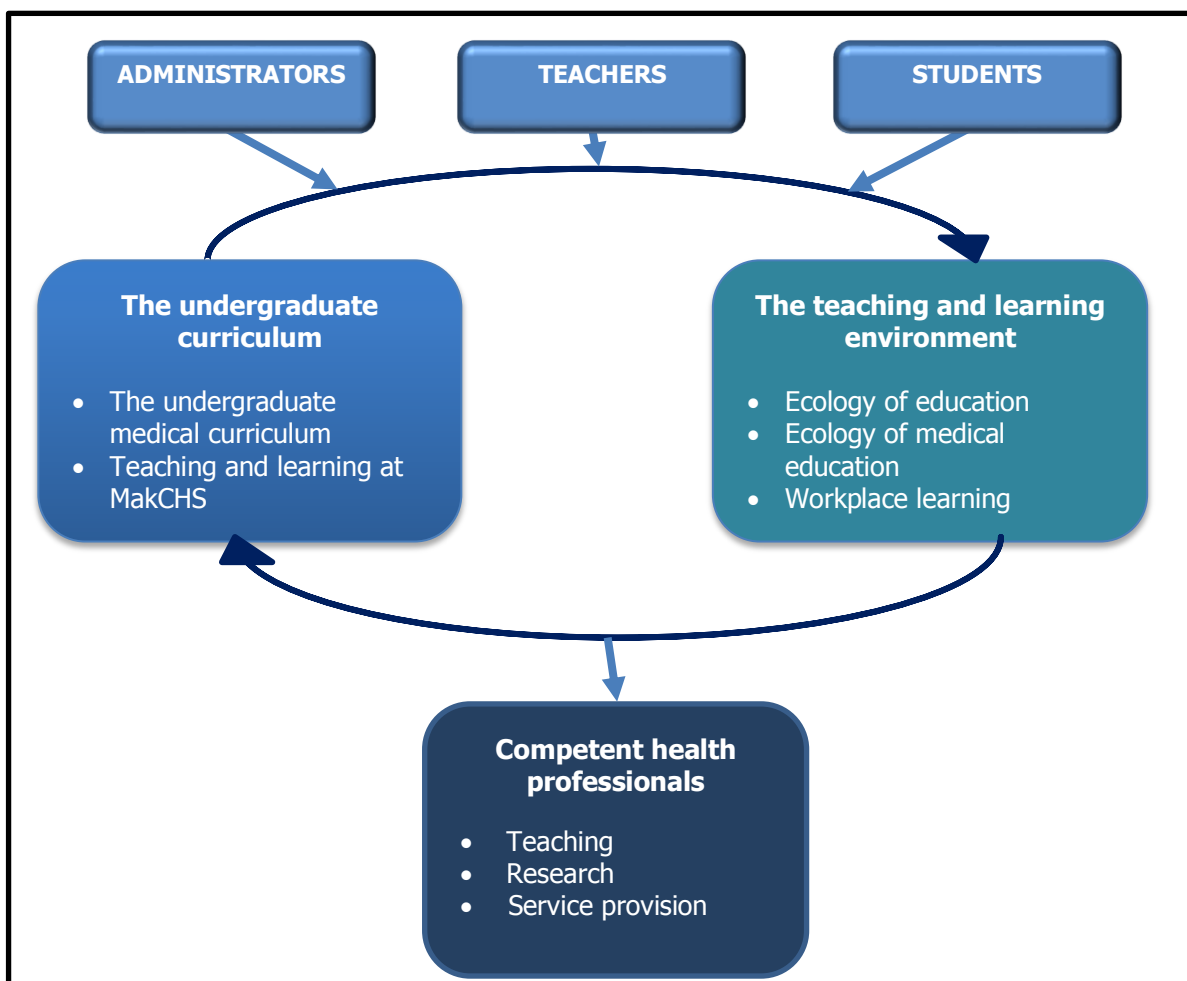
FIGURE 2.1: THE RESEARCHER'S CONCEPTUAL FRAMEWORK

2.1   THE ECOLOGY OF EDUCATION

Ecology is the study of relationships among organisms and between organisms and their environments. Where humans are involved, it is referred to as cultural ecology and it examines the relationship between a given society and its natural environment (Jenlink 2014:online). This relationship is usually complex, as each of the role players has a contribution to make. Each could impact the other negatively or positively, and it requires a critical balance to ensure continuity of the relationship. The education environment is referred to metaphorically as an ecosystem, because of the interrelated factors that constitute the education system. An individual's learning ecology comprises the process and sets of contexts, relationships and interactions that provide opportunities and resources for learning, development and achievement. Context has an important role in motivating students to learn and in altering the meaning they attach to the content being taught. For example, it is one thing to learn about blood and body fluids for the purpose of passing a test, and another to gain an appreciation of both the content and context in which blood and body fluids impact on body homeostasis (Barab & Roth 2006:3).

Because the education system is based on policies that are usually derived by consensus of many different role players, educational ecology refers to the **policies, people, places, traditions, economic and political conditions, institutions and relationships** that affect it or that it affects (Weaver-Hightower 2008:153). In the grand scheme of things, the ecology of education comprises **actors, relationships, environments and structures, and processes**. The actors include teachers, students, patients administrators, support staff, and policy makers; relationships may present in any of four categories, namely, **competition, cooperation, predation** or **symbiosis**. The actors and relationships cannot, however, work in isolation; they require environments and structures. For example, student achievement is a result of a set of complex interactions between these different elements of the ecology of education. Learning and achievement takes place in a dynamically evolving learning space that is formed, not only by the individual learner and teachers, but also, to a great extent, by the environment, culture and infrastructure (Johnson 2008:1; Normak *et al*. 2012:262). Considering the quality of education, certain factors contribute to the proper functioning of the education ecosystem, such as organisational structures, curriculum, assessment, funding, teachers, libraries, and information and communication technologies (Graue Delaney, & Karch 2013:online). Another issue in the ecology of education is processes, which are in constant dynamic

relations that include **emergence** and **entropy**. Emergence occurs when new sub-ecologies emerge when conditions for sustainability are present. A clear example is the emergence of private schools and universities in Uganda as a result of liberalisation of the education sector and the growth of a middle class that can afford to pay for schooling. This emergence inevitably creates competition; thus, requiring periods of renewal based on evaluation of existing systems and processes by the stakeholders. At the other extreme of this process lies entropy, which may result from failure of stakeholders to achieve consensus about the most appropriate ways of renewal in the education ecology.

2.3 THE ECOLOGY OF MEDICAL EDUCATION

Contemporary medical education has undergone significant changes from the traditional teacher-controlled approaches, to newer approaches, such as student-directed learning, problem-based learning, the use of skills laboratories and evidence-based medicine (Normak *et al.* 2012:262). A great deal of new information and new technologies are available, and patients' desires have changed. Furthermore, there has been a shift in patient numbers, case mix and demographics, such as age, gender, level of education, income level and employment. Health system expectations, clinical practice requirements and staffing arrangements have also changed over time (Corrigan, Eden, & Smith 2002:online; Weinberger 2009:239). These changes have important implications on how well medical students are prepared to provide quality health care services when they qualify. What is not clear, however, is whether clinical education at the workplace has kept pace with or been responsive enough to these changes (Corrigan *et al*. 2002:online).

These days, medical students are confronted with a rapidly expanding evidence base that contains the latest literature on illnesses and new management options. However, in low-resource settings students face limitations regarding access to this evidence, even though this evidence should form the basis of health care decision-making in these settings. Limitations regarding access may be due to several factors, among which is, lack of empowerment of students and teachers with facilities such as constant high-speed internet access, and the prohibitively high cost of subscription to electronic databases within the teaching and learning environment. Time constraints as a limitation may result from overloaded academic/clinical schedules, inadequate knowledge and skills in relation to using advanced search features, as well inadequate understanding of the statistical terms used in research articles (Majid *et al*. 2011:229; Muthukrishnan, Ille & Kumar 2016:online). Faced

by all these barriers and challenges, it becomes difficult for students (and, sometimes, teachers) to search and evaluate the evidence base that is available, and to apply it to practice, such as clinical presentation of illnesses and identification of drugs appropriate for particular illnesses.

An effective teaching and learning environment requires that the various interrelated factors that constitute the learning ecology (cf. Figure 2.2) work together. For example, there is need for protected time, designated or protected space, and preparation and identification of opportunities for teaching and learning by both teachers and students
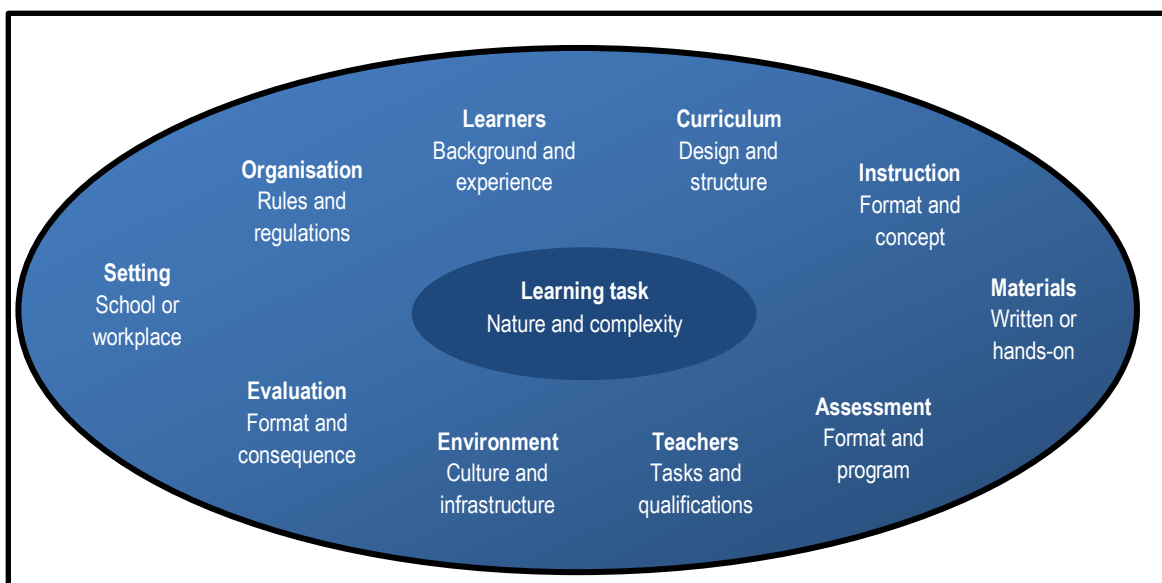
FIGURE 2.2: THE LEARNING ECOLOGY (Adapted from Ringsted *et al*. 2011:695)

Learning opportunities with patients should be balanced with acknowledgement of patient rights, i.e., the need to obtain informed consent from patients, and respect for patients' privacy, confidentiality and dignity (Cohen & Ezer 2013:7; Parniyan, Pishgar, Rahmanian & Shadfard 2016:36; Ramani & Leinster 2008:347). Another factor in the ecology of medical education is the availability of competent teachers. Competent teachers in the clinical workplace are not only required to be experts in a particular subject, but should also be formally trained in clinical teaching skills, because they play the dual roles of providing patient care and being teachers. Teachers need to integrate knowledge about the student, the subject and the patient, and about teaching and learning. They must also strike a balance between the needs of the clinical workload *vis-à-vis* the medical students' learning (Ramani & Leinster 2008:347; Spencer 2003:591). When all these factors are in place, teachers and students will perceive the workplace as an authentic teaching and learning

environment, and the environment can motivate both the teacher and the student to perform their respective roles.

2.4   WORKPLACE LEARNING

The workplace as a teaching and learning environment is a concept that involves using the medical practice workplace as the teaching and learning platform for medical students. The three basics of clinical medicine, that is, knowledge, attitudes and skills, can be acquired from the workplace. Teaching and learning at the workplace is based on the premise that medicine is learnt best through situated learning, which involves students learning by performing tasks and solving problems in an environment that reflects the multiple ways in which they will apply the knowledge thus acquired in professional practice in the future (Billet 1996:141; Le Clus 2011:355; Spencer 2003:591; Stalmeijer, Dolmans, Wolfhagen & Scherpbier 2009:535).

Spencer (2003:591) describes a teaching and learning environment as a place where real problems in the context of professional practice can be found, and where students are motivated to learn through active participation; learning takes place in the context in which the knowledge and skills that are acquired will be applied. Similar sentiments are expressed about teaching at the bedside: "there should be no teaching without the patient for a text, and the best teaching is often that taught by the patient himself". These words are attributed to William Osler, who was an advocate for bedside teaching (Janicik & Fletcher 2003:127).

It is important, therefore, that medical students learn on the job, as it is through such encounters with patients in the workplace that the physicians of the future get opportunities to obtain clinical experience with patients while learning in conditions similar to that of their future workplace. This experience creates a degree of authenticity in learning, as the students learn about the nature of clinical practice (Kohl-Hackert *et al*. 2014:43). Spencer (2003:591) states, "Real patients tell their stories and show physical signs while giving deeper and broader insights into their problems." While organising the workplace as a teaching and learning environment, it is, therefore, imperative that stakeholders remember the interdependence between work and learning (Le Clus 2011:355).

The humanistic learning theory has led to simulation-based learning gaining prominence as a teaching tool; however, the workplace remains an important pillar of medical education. There is a great deal of value in the physician-patient interaction, as non-verbal cues are followed to get more insights into the patient's problems; this is emphasised by Norcini and Burch (2007:855) who state that "Beyond diagnostic accuracy, physician-patient communication is a key component of health care". As noted by Holmboe, Hawkins and Huot (2004:874), the art of the clinical skills of interviewing, physical examination and counselling, remains as relevant to clinical practice today, as ever before. The concept of practice as part of learning also borrows from the theory of adult learning, which emphasises practice as a requirement for adult learning. Students should be actively engaged in the learning process while new knowledge is acquired, connected and applied to meaningful situations (McDonough 2013:345).

Miller (1990:S63) describes a framework of assessing clinical competence that can be used to determine what the student should be able to do at any stage of competence development. Ramani and Leinster (2008:347) adapted Miller's pyramid to include cognitive and behavioural aspects (cf. Figure 2.3). Firstly, the **"knows"** level of the pyramid forms the foundations for building clinical competence on the basis of factual knowledge recall, which can be assessed using multiple choice questions (MCQs). Secondly, the **"knows how"** level refers to the student's ability to acquire, analyse and interpret patient data and use it to create a management plan; this ability can be assessed using case studies or scenarios. Thirdly, the **"shows how"** level of the pyramid refers to assessment of competence by requiring the student to demonstrate clinical skills which can be done in the skills laboratory, through the use of Objective Structured Clinical Exams (OSCE) or with standardised patients. Lastly, the "**does"** level, which is the highest level of the pyramid, assesses professional competence in daily patient care by direct observation of the student, by the teacher, while students demonstrate their competence in the clinical setting while working with real patients (Ramani & Leinster, 2008:347). Professional competence is defined as the habitual and judicial use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice, to the benefit of the individual and community being served (Epstein & Hundert 2002:226).

While all the levels of Miller's pyramid are important for developing clinical competence, from being a novice to being a proficient clinician, the workplace as a teaching and learning environment provides an excellent opportunity to assess the "**does**" level as the most

important for assuring of professional competence, which translates into patient safety and satisfaction (Nyangena, Mutema & Karani 2011:22).
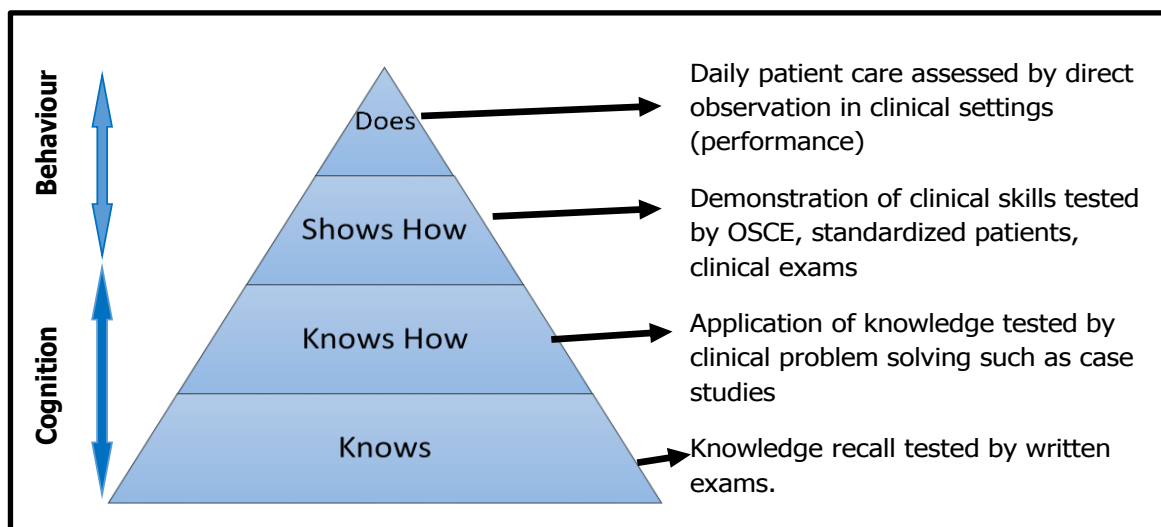
FIGURE 2.3: MILLER'S PYRAMID OF ASSESSMENT (Adapted by Ramani & Leinster 2008:347)

The clinical workplace plays an important role in the development of a students' overall competency, confidence, organisational skills and preparedness for practice (Edwards, Smith, Courtney, Finlayson & Chapman 2004:248). Other competencies that students develop in the workplace include communication and interpersonal and life skills, which have an impact on patient care (Salam, Siraj, Mohamad, Das, & Rabeya 2011:online). During workplace learning, there are opportunities for feedback during demonstrations and return demonstrations. This feedback promotes learning by informing students of their progress, advising students of their learning needs and the resources available for their learning, and motivates students to engage in appropriate learning activities (Norcini & Burch 2007:855). For example, during workplace learning, students are informed about the need to spend more time on the ward with patients in order to acquire the necessary skills, rather than only studying in the library.

In the workplace, teachers model behaviour and attitudes while they interact with real patients, and the students observe the behaviour, interactions and overall norms and culture of the training environment. A clinical teacher may also model professional thinking (by thinking aloud), which shapes students' values and attitudes. Morris (2010:48) explains, "Thinking aloud is a powerful way of giving the novice insight into the expert's clinical reasoning and decision-making process that may not easily be articulated in a didactic way". Through their interactions with patients, clinical teachers – knowingly or

unknowingly – have a powerful influence, as role models, on their students. This type of learning in the clinical setting has been described as the hidden curriculum (Hafferty 1998:403; Hafler *et al*. 2011:440).

Although teaching and learning in the clinical setting has many advantages, it is frequently undermined by challenges realting to implementation, such as time pressure, competing demands, increasing numbers of students and patients, short patient stays, concerns about patient safety, and litigation (Gat *et al*. 2016:online; Spencer 2003:591). For example, in the case of an emergency, the need to prioritise the clinical requirements of the patient as opposed to the educational requirements of the student may appear to undermine the opportunity for teaching and learning in the workplace (Magnier *et al*. 2011:169). Sometimes, the limitations of the teaching and learning environment appear to contradict what is taught in the classroom and what is observed in the workplace. Literature reports about opportunities for teaching and learning at the workplace that are missed. Incidents have been reported of opportunities for teaching, learning and feedback that could improve performance being missed because students were not observed during their clinical encounters with patients (Daelmans *et al*. 2004:305; Day *et al*. 1990:421; Norcini & Burch 2007:855).

Furthermore, infrastructure limitations may compromise patients' privacy, confidentiality and dignity. The physical infrastructure, design and organisation of the teaching and learning environment (campuses, buildings and classrooms) can have a profound impact on the success of students and faculty by enhancing or inhibiting teaching and learning (Streifling 2003:4). In the modern age, ICT is central to many systems, and teaching and learning environments need ICT infrastructure too. However, even where these facilities have been availed, there is a general lack of knowledge among teachers and students about the basics of health informatics (Gorman *et al*. 2000:353; Hovenga 2000:3).

2.5 THE UNDERGRADUATE MEDICAL CURRICULUM

Undergraduate medical training aims to produce medical graduates that can integrate the core principles of medicine, medical knowledge, clinical skills and professional attitude in their daily practice of providing patient-centred care. The undergraduate medical curriculum of MakCHS lists competencies that reflect the knowledge, skills and attitudes that medical students are expected to achieve during their training in preparation for practice. These

competencies are based on authoritative documents on undergraduate medical education, such as the Flexner report (Duffy 2011:269), the CanMEDS (Frank 2005), the Lancet Commission Report (Frenk *et al*. 2010:1923) and the Health Professions Council of South Africa document on core competencies for undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa.

Medical graduates will be considered competent when they are habitually capable of conscientiously, explicitly and judiciously using the current best evidence in clinical decision-making for caring for the individual patient or community (Epstein & Hundert 2002:226; Green 2000a:121). These days, teachers and students are inundated by an explosion of medical knowledge and new technologies that apply to diagnosis and treatment. The patient of today is better informed because medical information is more readily available and easily accessible on the Internet; and this provides attendant increased opportunities for litigation. This means that training of health workers should move with the times, and should focus on important and observable knowledge, skills and attitudes in an attempt to answer the question stated in the The CanMEDS 2005 Physician Competency Framework, "How can we best prepare physicians to be effective in this environment and truly meet the needs of their patients"? (Frank 2005). *The Lancet Commission Report* points out that there is evidence of a mismatch between graduate competencies and the needs of the population they serve (Frenk *et al*. 2010:1923). Therefore, training of medical students requires that, while designing the undergraduate curriculum, it is imperative that designers are cognisant of the explosion in medical knowledge and technology, as well as ease of access to medical literature by patients, which can lead to litigation.

The undergraduate medical curriculum at MakCHS is a five-year competency-based curriculum. The curriculum aims to produce medical graduates with competencies in the following domains: medical knowledge, clinical skills and patient care, critical inquiry and scientific method, professionalism and ethical practice, interpersonal and communication skills, leadership and management skills, population health, continuous improvement of care through reflective practice, and health systems management.

This curriculum is implemented in three phases that spiral into each other**.** Phase 1 predominantly covers principles and foundations of medical education, and the normal structure and function of the human body. Phase 2 exposes students to pathophysiology, and Phase 3 is dominated by clinical experience, where instruction is done mainly in the

workplace, namely, in hospitals, at patients' bedsides, in outpatient clinics or in operating theatres. During Phase 3, that is, in the fourth year of study, courses undertaken by medical students are, anaesthesia, ophthalmology, ear, nose and throat (ENT), internal medicine, paediatrics and child health, surgery, and obstetrics and gynaecology. Fifth-year students enrol for internal medicine, paediatrics and child health, surgery, and obstetrics and gynaecology (MakCHS 2011).

2.6 TEACHING AND LEARNING AT MAKERERE UNIVERSITY COLLEGE OF HEALTH SCIENCES

Makerere University was founded in 1922 as a technical school. It became the University of East Africa in 1963 and offered degrees for the University of London before it became an independent national university in 1970. The medical school has been part of the University since 1924 and is the oldest medical school in eastern Africa. In 2008 the medical school was transformed into a constituent college of Makerere University, and is now referred to as Makerere University College of Health Sciences (MakCHS). MakCHS comprises four schools: School of Medicine, School of Health Sciences, School of Public Health and School of Biomedical Sciences.

MNRTH was founded in 1913 and expanded to its current setting in 1962**.** The hospital serves as a national referral hospital for the entire country and it is divided into different departments and units. MNRTH also serves as a primary health care facility for the Kampala city metropolitan area, and patients can walk in without being referred. The official capacity of the hospital is 1,790 beds, though the bed occupancy rate is over 120%.

These two institutions (MakCHS & MNRTH) have parallel administrative structures. At the top management of the college hierarchy is the college principal as the chief executive officer, the deputy principal and college academic registrar. Each of the four schools of the College is headed by a dean and an academic registrar. Regarding MNRTH, there is the hospital director, who is the chief executive officer, a deputy director and a principal hospital administrator.

In addition to MakCHS, other institutions use MNRTH as a teaching and learning environment, among which are Mulago School of Nursing and Midwifery, Uganda Institute of Allied Health Professionals, for paramedical students, Mulago Health Tutors' College,

International Health Sciences University Kampala, and The Agha Khan University Kampala. In addition, international students visit MNRTH for elective exposure and research, and the hospital is a site for continuing professional development activities for in-service health workers. Students of other institutions who use MNRTH as a training platform may appear to pose a threat to MakCHS undergraduate medical students because of competition for patients and space – the apparent demand means MNRTH, therefore, needs to improve the workplace as a teaching and learning environment.

2.7   CONCLUSION

Chapter 2 conceptualised and contextualised a teaching and learning environment. Relevant literature was explored and cited, with a focus on the conceptual framework. The chapter comprises the following subheadings: the ecology of education, the ecology of medical education, workplace learning, the undergraduate medical curriculum and teaching and learning at MakCHS.

The next chapter, entitled **Methodology,** will discuss the various methods and the justification for choosing the methods. Trustworthiness is also discussed.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1   INTRODUCTION

In this chapter the various research methods used during the study are described. Literature to justify the methods used is also discussed, trustworthiness of the data gathered is discussed at the end of this chapter. The study was done in three phases, and all the research methods used to conduct the study are described in this chapter.

3.2   DESIGN

This study used a cross-sectional descriptive study design and a mixed methods approach. Both qualitative and quantitative methods were used to examine the workplace at MNRTH, as the teaching and learning environment for undergraduate medical students of MakCHS. The experiences and perceptions of administrators and teachers about teaching and learning at this site were explored using key informant interviews, and those of students using focus group discussions and an adapted DREEM questionnaire. The Delphi technique was used to build consensus on recommendations for improving teaching and learning at the workplace (Giannarou & Zervas 2014:65; Hsu & Sandford 2007:online; Penciner *et al*. 2011:e333).

3.3   PARADIGM

The research questions are answered using an **interpretivist** lens, through which a detailed picture of a phenomenon is built through a series of in-depth accounts of different stakeholders who have experienced the phenomenon personally, and which leads to varied and diverse explanations of reality, instead of looking for a single, predominant truth (Bunniss & Kelly 2010:358). Interpretivism focusses on understanding, by means of inductive reasoning in a researcher-participant interaction in the natural environment, by recognising, understanding, developing and contrasting constructions through dialogue (Bergman *et al*. 2012:545). The interpretivism paradigm recognises that reality and knowledge are subjective and can change, and that there is no single ultimate "truth" or "correct way", instead, there are multiple and diverse interpretations of reality that require

consensus building among stakeholders in order for complex systems, such as health services and education, to function optimally – if they do not function optimally, entropy can result.

A quantitative approach was used by this study to represent the situation in numbers and frequencies, while the qualitative approach provided an explanation for, and/or the reasons behind the numbers. The emphasis in this predominantly qualitative approach is on **exploring** the context, processes, experiences and perceptions of the various stakeholders in their natural settings and diversity, as essential components of an interpretation of the teaching and learning environment at MNRTH in relation to the undergraduate medical curriculum of MakCHS.

3.4 STUDY SETTING

Most of the departments where undergraduate medical students of MakCHS undertake clinical placements are found in one big area known as Mulago Hospital Complex. Only psychiatry is based at Butabika Hospital which is a specialised psychiatry hospital situated about nine km from MNRTH. Mulago Hospital Complex has 10 clinical departments, namely, **Surgery (General Surgery, Orthopedics, Cardiothoracic Surgery, Neurosurgery), Obstetrics and Gynaecology, Internal Medicine, Paediatrics and Child health, Ophthalmology, Anaesthesia and Critical Care and ENT**.

Undergraduate medical students of MakCHS study for five years before graduation and start their clinical placements in the fourth year. Prior to their comprehensive clinical placements, they are introduced to the wards during clinical exposure, which begins in the first year. This programme of clinical exposure is intended to assist the students, from an early stage in their medical training, to relate knowledge of the basic sciences to clinical conditions on the wards. During their comprehensive clinical placements, students are allocated to different wards for their training and the workplace at MNRTH functions as a teaching and learning environment. During clinical teaching, students have two options for their clinical placements, A or B, a student selects either option A or B for a semester, and then the other option for the next semester. For each semester, the students in Year 4 are further subdivided into three groups for placement in the Departments of Surgery, Internal Medicine, Obstetrics and Gynaecology, Paediatrics and Childhealth and Psychiatry. Each placement lasts five weeks of a semester of 17 weeks. Shorter clinical placements, lasting

two weeks, in the Departments of Anaesthesia and Critical Care, ENT, and Ophthalmology, are also designed and embedded within the five-week placements (cf. Appendix A). Students in Year 5 are divided into two groups, and each clinical placement lasts seven weeks (with one week of pharmacotherapeutics). The last two weeks of each semester are dedicated to summative examinations. Year 5 comprises two semesters, with no recess term, and students rotate in the Departments of Surgery, Internal Medicine, Obstetrics and Gynaecology, Paediatrics and Childhealth, and Psychiatry.

3.5 DESCRIPTION OF METHODS

The mixed methods approach was adopted because of the complex nature of health services and educational research, and because using either a quantitative or a qualitative approach would not have been sufficient to address this complexity (Bunniss & Kelly 2010:358). Mixed methods research refers to the use of a combination of elements of both qualitative and quantitative methods during data collection, analysis and interpretation. It is an approach that uses between-methods triangulation, with the main aim of improving understanding and corroboration (Johnson, Onwuegbuzie & Turner 2007:112). For example, while a quantitative approach could generate mathematical scores pertaining to particular attributes of the teaching and learning environment, a qualitative approach could explain the reasons underlying the different scores. Using the two approaches in concert could provide an expanded understanding of the research problem.

Several strategies can be used in mixed methods research. For purposes of this study, the **sequential exploratory strategy** was adopted. Phase 1, which was a document review (qualitative) was done to provide background and context. This was followed by the DREEM questionnaire (quantitative) that was administered to students. The subsequent focus group discussions and key informant interviews (Phase 2) essentially used a qualitative approach, aimed at explaining the findings of the DREEM, and generated suggestions for improvement of the workplace as a teaching and learning environment for inclusion in the Delphi survey (Phase 3).

The sequential exploratory strategy was well suited to this study, which sought to develop recommendations for improving teaching and learning in the workplace. The perceived need for improvement was based on literature that reported a mismatch between the competences of the current crop of medical graduates and patient/population needs (Frenk

et al. 2010:1923). The mixed methods approach with a sequential exploratory strategy lends itself to better understanding and acceptance amongst a scientific community, such as the medical fraternity, which is usually grounded in quantitative research methods.

When using a mixed methods research approach, it is important to consider the attributes of mixed method research, namely, **timing, mixing and weighting.** Timing refers to whether the qualitative or quantitative data collection will be done **sequentially or concurrently**. In this study, the approaches were initially used **concurrently,** with a document review of the curriculum, as the qualitative approach, applied at the same time as the DREEM tool that was administered to all undergraduate students during their clinical placements. After this, **sequencing** applied, as information from these two data collection methods was used to enrich the contents of the tools used in the focus group discussions (with students) and the key informant interviews (with administrators and teachers), which were purely qualitative. Further **sequencing** happened when the results of the two qualitative approaches led into another quantitative process, the Delphi, which was aimed at achieving consensus on recommendations for improvement. As far as **mixing** is concerned, the qualitative and quantitative methods were **connected** between the data analysis phase of the first and the second phases (cf. Figure 3.1).
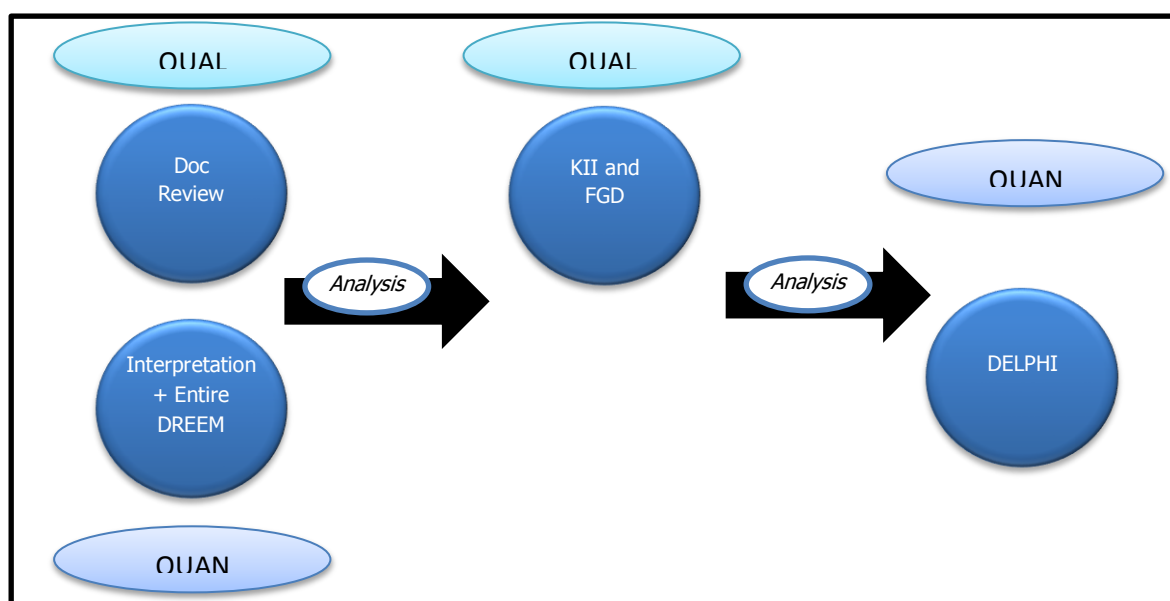
Key: KII – key informant interviews;   Qual – Qualitative; FGD – focus group discussions
Quant – Quantitative;   Doc – Document

FIGURE 3.1: TIMING AND MIXING OF METHODS USING THE SEQUENTIAL EXPLORATORY DESIGN

In terms of **weighting,** this study emphasised a primarily **inductive approach**. The qualitative approach would appear to carry more weight, as it prepared the ground for the quantitative and final phase of the study, the Delphi study involving experts, which was used to generate consensus on recommendations for improving teaching and learning at the workplace.
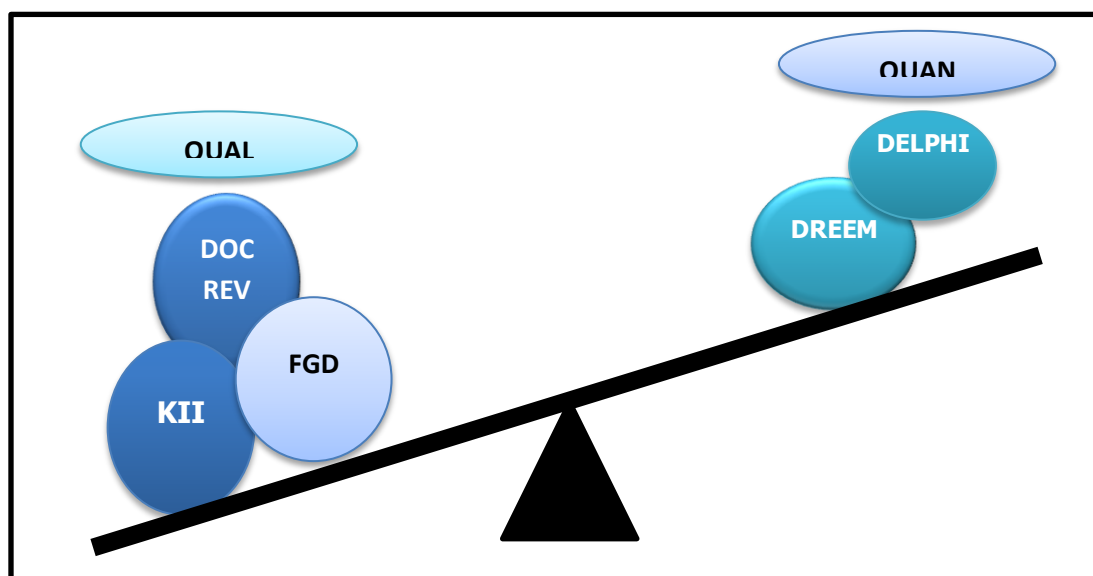
FIGURE 3.2: WEIGHTING OF THE DIFFERENT METHODS: QUALITATIVE AND QUANTITATIVE

3.5.1   Phase 1: The Document review

This phase addressed the first objective of the study, of which the aim was to examine the undergraduate medical curriculum at MakCHS and its application during the students' placement at the workplace at MNRTH. A thorough document review of the undergraduate curriculum was done. Reference was made to authoritative documents on medical education, such as the Flexner Report (Duffy 2011:269), the CanMEDS (Frank 2005) and the Lancet Commission Report (Frenk *et al*. 2010:1923). The main purpose of this document review was to develop an understanding of the undergraduate medical curriculum at MakCHS, to use texts to provide context and background, and discover insights relevant to the study. Information from this document review was used to generate additional discussion points for the interviews with the administrators, teachers and students. While a document review alone of the formal curriculum could not provide a comprehensive reflection of the actual teaching and learning experienced by teachers and students, it did provide valuable insights into the curriculum expectations and operations of undergraduate medical education at MakCHS, upon which points for further discussion could be built.

3.5.1.1 *Sample size and selection criteria*

The document setting out the undergraduate curriculum for medical students of MakCHS was the main document that was reviewed. The review focussed on those areas of the curriculum that involved teaching and learning at the workplace. Courses taught from the workplace as a teaching and learning environment for undergraduate medical students were evaluated in terms of the stated learning objectives and expected outcomes for the various departments. Course coordinators were requested to provide learning schedules for the clinical courses that were used by the teachers and students. Learning schedules are timetables that are usually drawn up by course coordinators, that indicate the topics for discussion, the date and time, the suggested place of teaching (ward, outpatient clinic or theatre) and the responsible teacher.

3.5.1.2 *Data collection*

An iterative, systematic and comprehensive process of document analysis involving skimming (superficial examination), reading (thorough examination), and interpretation was undertaken (Bowen 2009:305). A matrix was designed to capture the course objectives and learning outcomes, the content outlines, year of study, number of sessions, suggested teaching methods and assessment methods (cf. Appendix B).

3.5.1.3 *Data analysis and presentation*

The objectives and learning outcomes were matched with the content outlines, year of study, number of sessions, suggested teaching methods and assessment methods. The concepts used in the curriculum document were assessed and compared to levels of Bloom's revised taxonomy (Su, Osisek & Starnes 2005:117). The results are presented in the form of a description of the findings based on the curriculum areas evaluated, namely, the **learning objectives** and four of the nine domains of competence; **professionalism and ethical practice, medical knowledge, clinical skills and patient care, and assessment,** which served as tracer domains for teaching and learning in the workplace.

3.5.2 Phase 2: The suitability of the workplace as teaching and learning environment

Phase 2 addressed the second objective, which sought to determine how, from the administrators', teachers' and students' perspectives, the workplace at MNRTH, as teaching and learning environment, fulfilled the requirements of the undergraduate medical curriculum. A critical appraisal was performed of the strengths, opportunities, challenges, knowledge and stakeholders involved in teaching and learning medicine at the workplace. For this phase, several data collection methods were utilised. Data was collected from the administrators and teachers using key informant interviews, while data was collected from students using the DREEM tool and focus group discussions.

3.5.2.1 *Target population*

The study population included administrators, teachers and students at MakCHS and MNRTH.

3.5.2.2 *Selection criteria*

Administrators who were eligible to participate in the study included the principal of MakCHS, as the chief executive, the deputy principal and the registrar of the College; the dean of the School of Medicine and registrar of the School of Medicine. From the hospital side, eligible participants included the director of MNRTH, as the chief executive, the deputy director and principal hospital administrator.

All heads of departments and lecturers at MakCHS, from the level of assistant lecturer to professor, were eligible to participate. All specialist doctors from the level of Medical Officer Special Grade (MOSG) also referred to as registrar to senior consultants involved in teaching undergraduates and working with MNRTH, were eligible to participate. The hierarchy of teaching staff at MakCHS and MNRTH is explained in Figure 3.3.
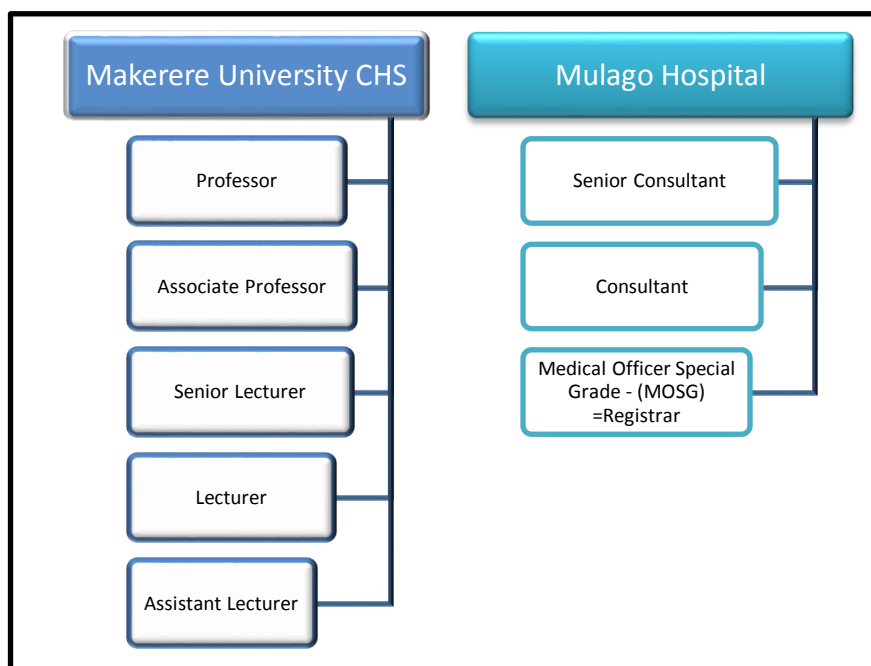
FIGURE 3.3: HIERARCHY OF CLINICAL STAFF AT MAKCHS AND MNRTH ELIGIBLE TO PARTICIPATE

All undergraduate medical students in their fourth and fifth years of study were eligible to participate in the study.

3.5.2.3 *Sampling*

The **administrators** who participated in the study were selected using purposive sampling. Purposive sampling is aimed at capturing diversity in relation to a phenomenon, and involves participants being selected because of their ability and willingness to provide information by virtue of their knowledge and experience (Tongco 2007:147). All **eight top administrators** listed above were requested to participate in the study as key informants, because of the vast knowledge they possess about the teaching and learning environment at MNRTH. The aim was to include MakCHS and MNRTH administrators who had served in their positions for a minimum of three years.

The aim of selecting these particular participants with three or more years of experience was to ensure that all knowledgeable people were consulted, as there had been appointments/election of new administrators during the study period. The selection of participants with three or more years of experience was guided by the belief that, in every culture, some individuals know much more than the average person, and it therefore

becomes imperative to talk to those with more experience rather than randomly selecting individuals to participate (Tongco 2007:147).

The various departments at MNRTH had the following numbers of teachers at the time of the study: Surgery (General Surgery, Orthopedics, Cardiothoracic Surgery & Neurosurgery) = 42; Obstetrics and Gynaecology = 44, Anaesthesia and Critical Care = 8; ENT = 9; Ophthalmology = 6; Internal Medicine = 49 and Paediatrics and Childhealth = 29. This gave a total of 187 teachers and 10 heads of departments.

The quota sampling and snowball sampling methods were used to collect data for the key informant interviews. With the quota sampling method, the aim was to select a number of teachers from each department proportionate to the total number of teachers in the department, including the head of department. After determining the number for each department, sampling of the number of participants per department was done as follows: Two were selected from the departments with fewer than 10 teachers, four from departments with 11 – 20 teachers, and six from departments with more than 20 teachers. Thereafter, snowball sampling was done by asking the heads of departments to identify people who they thought would provide valuable insights for the study (Marshall 1996:522). Snowball sampling ensures that representative information/data on the subject matter is obtained from appropriate participants. The plan was to recruit 30 teachers, with representation from each of the 10 departments (cf. point 3.4). This number is consistent with the suggestion that between five and 50 is often an adequate sample size in qualitative research (Guest, Bunce & Johnson, 2006:59).

Data collection from **students** was done using focus group discussions and an adapted DREEM questionnaire, which is a validated tool for studying the clinical learning environment (Vaughan, Carter, Macfarlane & Morrison 2014:online; Whittle *et al*. 2007:online). All undergraduate medical students in their clinical years (Years 4 & 5) were eligible to participate in the study. There were 130 students in their 4th year and 128 students in the their 5th year, giving a total of 258 undergraduate medical students. At the end of each questionnaire, the students were requested to state three ways that teaching and learning at the workplace could be improved. This additional information was used to generate the suggestions that were subjected to the Delphi process.

For purposes of the focus group discussions, groups of 6-8 participants were created, based on year of study. Two focus group discussions were held with Year 4 medical students and

another two were held with Year 5 medical students, giving a total of four focus group discussions. The purpose of the focus group discussions was to understand the reasons for the perceptions expressed in the DREEM and to also get suggestions for improvement.

3.5.2.4 *Data collection procedure, analysis and presentation*

Administrators and teachers

Data collection from administrators and teachers at MakCHS and MNRTH was done using key informant interviews. It was hoped that the administrators and teachers, with their vast knowledge, experience and understanding, would be a great resource, as key informants, and would provide insight about the workplace at MNRTH as a teaching and learning environment. At the beginning of each interview, the key informants were informed of the type of information required, to give them some orientation and gain common ground as part of rapport-building. During the interviews, participants were asked for clarification or additional information about their answers and the manner of presentation. This approach provided flexibility and gave the participant considerable leeway and the interviewer latitude to explore the participants' answers. A salient feature of this informant-researcher interaction is that the participant is encouraged to reveal facts pertinent to the researcher's interest, as clues are followed and clarifications requested so that the informant's interest is continuously revived and sustained (Dicicco-Bloom & Crabtree 2006:314).

An interview guide with a list of topics and issues to be covered during each session was designed (cf. Appendix C). Information was sought about the teachers' impressions of the workplace as a learning environment, its strengths and weaknesses, the curriculum requirements, their expectations of the students, and their perceived role and challenges in facilitating student learning. At the end of each interview, the administrators and teachers were requested to state three ways in which teaching and learning at the workplace could be improved, and this information was included in the Delphi survey. When possible, the interviews were recorded using an audio tape recorder, and permission to do this was obtained from the participants prior to the interview. The recorded interviews were transcribed for later analysis.

Data from the key informant interviews of the administrators and teachers was analysed using the computer software ATLAS.ti (Woods, Paulus, Atkins & Macklin 2015) . Text data was transformed into descriptive codes to cover key issues, perceptions and ideas about

the workplace as a teaching and learning environment, and then presented as themes for discussion in the results section. A theme is a central idea that captures recurring aspects of data in an interpretive description and the process of generating themes is described thus: "The development of themes is a common feature of qualitative data analysis, involving the systematic search for patterns to generate full descriptions capable of shedding light on the phenomenon under investigation" (Gale, Heath, Cameron, Rashid & Redwood 2013:online).

Students

Data was generated by students through both quantitative and qualitative data collection methods. Quantitative data was collected from students using the adapted DREEM questionnaire, and qualitative data was collected using focus group discussions. An additional set of questions was added to the DREEM, requesting students to make three recommendations for improving teaching and learning at the workplace.

Findings from the adapted DREEM were analysed according the guidelines of Sean McAleer and Sue Roff (Genn 2001:445, Idon Ikhodaro, Suleiman Kayode & Hector 2015:139,). The responses to the questions were scored using a Likert scale according with the following options: Strongly agree (S) – 4, Agree (A) – 3, Uncertain (U) – 2, Disagree (D) – 1, Strongly disagree (SD) – 0. Nine of the 50 items (numbers 8, 12, 15, 16, 21, 23, 34, 39 & 45) were negative statements, which were scored as follows; Strongly agree – 0, Agree – 1, Uncertain – 2, Disagree – 3, Strongly disagree – 4.

The maximum possible individual score obtainable is 200, which indicates an ideal educational environment as perceived by the student. A score of 100 indicates a learning environment viewed with considerable ambivalence by the student, and needing improvement; and a score of 0 – the minimum possible score – would be a worrying result as it would reflect a learning environment with major issues.

The frequencies of the scores of all participants can be calculated and categorised to obtain a general impression of the education environment, and can be interpreted as follows:

- 0 – 50 = Very poor
- 51 – 100 = Plenty of problems
- 101 – 150 = More positive than negative
- 151 – 200 = Excellent

The questionnaire was analysed further, according to subcategories, to provide insight into students' perceptions of the five separate elements of the educational environment (Whittle *et al.* 2007:online), namely, Perceptions of learning (PoL), with a maximum score of 48, Perceptions of teachers (PoT) with a maximum score of 44, Academic self-perception (ASP), with a maximum score of 32, Perceptions of atmosphere (PoA), with a maximum score of 48, and Social self-perception (SSP), with a maximum score of 28. The respective scores of each of these elements can be interpreted as follows:

Perceptions of learning

- 0 -12   =   Very poor
- 13 – 24   =   Teaching is viewed negatively
- 25 – 36   =   A more positive perception
- 37 – 48   =   Teaching highly thought of

Perceptions of teachers

- 0 – 11   =   Abysmal
- 12 – 22   =   In need of some retraining
- 23 – 33   =   Moving in the right direction
- 34 – 44   =   Model teachers

Academic self-perception

- 0 – 8   =   Feelings of total failure
- 9 – 16   =   Many negative aspects
- 17 – 24   =   Feeling more on the positive side
- 25 – 32   =   Confident

Perception of atmosphere

- 0 – 12   =   A terrible environment
- 13 – 24   =   There are many issues that need changing
- 25-36   =   A more positive attitude
- 37 – 48   =   A good feeling overall

Social self-perception

- 0-7   =   Miserable
- 8 – 14   =   Not a nice place
- 15 – 21   =   Not too bad
- 22 – 28   =   Very good socially

Items were also analysed individually to pinpoint more specific strengths and weaknesses within the teaching and learning environment. The guide suggests that, at this level of

analysis, items with a mean score of 3.5 and above indicate real positive points, mean scores between 2 and 3.5 indicate aspects of the environment that need to be improved, and items with mean scores of 2 or lower could indicate real problem areas that require closer examination. While the DREEM scores could pinpoint areas of specific strength or weakness, it could not provide explanations for issues underlying scores, and the focus group discussions were used to elucidate the findings of the DREEM (Whittle *et al.*, 2007:online).

For the qualitative aspect, a focus group discussion guide (cf. Appendix D) was used and additional questions were formulated as the focus group discussions progressed, from items that received the lowest scores on the DREEM questionnaire. The focus group discussions were conducted by the principal investigator, assisted by a focus group discussion expert. Each focus group discussion involved eight to 10 participants and lasted between 45 minutes to one hour. It was important to limit the number of participants in the focus group discussion, as groups that are too large may lead to disorder and fragmentation; alternatively, groups that are too small may limit the variety of perspectives offered (Rabiee 2004:655).

Focus group discussion participants were selected purposively, so that the participants would feel comfortable with each other and would be motivated to engage freely in the discussion. Participants from the fourth year were put together, as were students in the fifth year. Doing so helped to build trust among the members, which allowed free expression of their views, encouraged them to challenge one another and generated data based on synergy of group interaction, while providing insight into opinions regarding MNRTH as a teaching and learning environment. The purposive selection of participants provided useful data in terms of ideas and attitudes as well as different perspectives. Information obtained from the focus group discussions included how the students had been prepared for workplace learning, their expectations and learning experiences, what opportunities (promoters of learning) and challenges (hindrances to learning) they experienced at the workplace, how supportive the environment was in terms of utilisation of spare time on the wards, as well as the support they received from the teachers. Once participants had given permission, the discussions were recorded using an audio recorder. Additional notes were taken to record non-verbal interactions, and to document the impact of group dynamics and exchanges of views.

Data **analysis** from the students' focus group discussions was done using the seven stages of the Framework Method (Gale *et al*. 2013:117). The interviews were skilfully conducted with the assistance of an expert qualitative research assistant, and recorded, and observational notes were taken. The audio-recorded interviews were transcribed for analysis (Stage 1). The audio recordings and transcripts were listened to and read together several times for familiarisation (Stage 2). The transcripts were then analysed using the computer software ATLAS.ti (Woods *et al*. 2016:597) and open coding was done by scrutinising the data, and highlighting and sorting quotes from the original text using an inductive approach (Stage 3). The quotes were then grouped together into categories by comparing and contrasting data, in an attempt to make sense of the individual quotes and to identify relationships in the quotes by bringing similar quotes from other parts of the data set together to form categories that would form the themes (Stages 4, 5 & 6). The emerging themes formed the basis for discussion of the perceptions of the students about the workplace as a teaching and learning environment (Stage 7).

Participants were encouraged to share personal experiences, and these were given more attention than responses referring to hypothetical situations in the workplace. Deviant findings were considered in more detail and explanations sought through further literature review. Triangulation was done to compare findings from the quantitative and qualitative data gathering methods, in order to strengthen the capacity of the data to identify important issues upon which recommendations would be based.

Data will be presented and discussed in Chapter 5 (cf. point 5.2), using themes identified during analysis and supported by quotes from the focus group discussions.

3.5.3   Phase 3: Recommendations for improvement

This phase related to the third objective of the study, which was to generate recommendations for improving teaching of and learning by undergraduate medical students in the workplace. The Delphi technique was used and the principal investigator, working with a statistician, collected and analysed the data.

The Delphi technique is a scientific method that can be used to achieve convergence of opinions on a particular topic. While most common survey techniques try to answer the question of "what is?" the Delphi technique attempts to answer the question, "what should

be?" (Hsu & Sandford 2007:online). It is an iterative method for consensus building by stakeholders, and is well suited for generating recommendations.

3.5.3.1 *Target population*

Experts for the Delphi panel were drawn from teachers of undergraduates at MakCHS and MNRTH, the principal study sites. Further participants were invited to participate from three other universities in Uganda that provide undergraduate medical education, namely, Mbarara University, Gulu University, and Busitema University; and four universities outside Uganda, namely, University of Cape Town, University of the Witwatersrand (both in South Africa), University of Zimbabwe, and Mekele University (Ethiopia). These stakeholders were chosen because of their health care backgrounds and experience of teaching and learning, which would provide useful inputs based upon rational judgment, rather than merely guessing, concerning teaching and learning at the workplace (Hsu & Sandford 2007:online). All the invited participants were subjected to a screening tool for eligibility. The requirements for eligibility were participation in teaching undergraduate medical students, being a clinical teacher, five or more years of teaching undergraduates, and willingness to answer the Delphi questionnaire (Giannarou & Zervas 2014:65).

3.5.3.2 *Data collection and analysis*

The first round of questions in the Delphi survey was generated from the results of the Phase 1 and Phase 2 studies and the recommendations for improvement made by the administrators and teachers during the key informant interviews, and students in the DREEM questionnaire and focus group discussions. Participants were informed at the very start that, in subsequent rounds, responses from the previous rounds would be anonymised and availed to all participants for further scrutiny. This anonymity and confidentiality of the responses were aimed at encouraging openness, so that participants expressed their views freely, while reducing the effects of group dynamics, such as suppression by dominant individuals and manipulation or coercion to conform or adopt a certain viewpoint, which is inherent in group-based methods of data gathering, including focus group discussions (Hsu & Sandford 2007:online; Ludwig 1997:online).

Survey forms were sent to all participants by email, and they were requested to give their responses within a period of 10-14 days; those who failed to respond received polite email

reminders every three days. Additional follow-up methods included physical contact reminders or telephone calls, whenever feasible. Three rounds of consensus-seeking were done to generate recommendations for improving teaching and learning at the workplace (Giannarou & Zervas 2014:65).

Participants were requested to read each statement as a recommendation for improvement and to choose one of three options – **Must have**, **Good to have**, **Unnecessary** – as it related to the suggested recommendation. There was a comment section for each suggested recommendation where participants could make comments regarding their choice and views about the statement (cf. Appendix L). Consensus was considered to have been achieved when $\geq$70% of the participants selected **Must have/Essential** for each round (Giannarou & Zervas 2014:65; Larson & Wissman 2000:43; Von der Gracht 2012:1525). Items that achieved consensus on each round were excluded from subsequent rounds. The Delphi was administered for three rounds, and the participants were requested to make their final submissions on the third and final round, with comments about their choices.

The findings of Round 1 were compiled into a brief report that was shared with the participants. The report was sent as an attachment to individualised email messages to all the participants, which thanked them for their participation, shared the findings and informed them about the next round. The report included a summary of the findings and their interpretation, and the Delphi questionnaire with the consensus statements highlighted. The comments given by the different participants were anonymised and shared with all participants. The purpose of sharing the comments was to give the participants an idea of other people's views, which could either make them change their minds or reinforce their choices during the second round. At this stage, the participants were not expected to do anything except familiarise themselves with the findings.

Shortly after this email, the second round of the Delphi survey was sent out, with similar instructions as above. This round had fewer statements, as consensus had been reached in Round 1 about some of them, and they were excluded. Recurrent comments by many participants were compiled into statements for inclusion in the next round as suggested recommendations. When responses had been received from all the participants, consensus was calculated again, at the same level, $\geq$70%. The report of the second round was similar to that of the first round. The participants were requested to take cognisance of the level

of consensus reached in Round 2, to familiarise themselves of their individual choices of responses in Round 2 compared to Round 1, and to take note of the comments provided by all the participants. The level of consensus reached thus far and the previous individual choices were important for the next (third) and last round of the Delphi survey, during which the participants were expected to make their final submissions.

The third round had even fewer statements, and the participants were requested to make their final choices. Analysis of the third and last round was also based on $\geq$70% as consensus.

Data is presented in Chapter 7, Section 7.3 in the form of consensus statements that indicate the round in which consensus was achieved, and the level of agreement among the experts.

3.6   RIGOR AND TRUSTWORTHINESS

Rigor and trustworthiness of a research study are assessed according to four criteria: **credibility,** which refers to confidence in the truth of the findings; **transferability,** which refers to the need to show that the findings have applicability in other contexts; **dependability,** which means showing that the findings are consistent and could be repeated; and **confirmability,** which refers to a degree of neutrality or the extent to which the findings of the study are shaped by participants and not the researcher's bias, motivation or interest (Krefting 1991:214). Every effort was made to ensure that the above four criteria were met.

Familiarity with the study environment is one of the ways of ensuring **credibility**. The fact that the principal investigator was familiar with the study area, as a member of staff, created trust that contributed to credibility. While familiarity with the study environment may have its drawbacks, such as the possibility of undue influence that could lead to bias, this was mitigated by using questionnaires adapted from validated tools for data collection, using well-designed qualitative data collection tools, and involving an experienced qualitative research assistant. The document review provided background, and through this element of the study, it was possible to verify details about the curriculum, which served as an added advantage in the effort to improve familiarity (Shenton 2004:63). Another way credibility was ensured was the voluntary nature of participation in the study by the participants. They

were informed during the process of obtaining consent that they could withdraw from the study at any time, thus, ensuring that data collection sessions involved only those participants who were genuinely willing to take part and offer data freely, and this ensured their honesty.

Transferability is sometimes difficult to achieve in qualitative research, because observations are defined by the context in which they occur. Efforts were made to provide sufficient contextual information about the investigation, study sites and participants through the thick descriptions of the study methods, the workplace, the learning environment, that is, MakCHS and MNRTH, the administrators, teachers and students, which can give the reader insight into the boundaries of the study and, therefore, aid in achieving transferability (Lee & Baskerville 2003:221).

Dependability was ensured by training the research assistants on how to use the data collection tools, thereby minimising inadvertent errors. Research assistants with experience in qualitative research methods were employed. Pretesting the data collection tools was done before the study onset, to obtain feedback from potential participants regarding how easy or difficult it would be to collect information in the study setting. Dependability is closely linked to credibility, and a detailed description, as stated above, of the research design and its implementation, data gathering techniques and reflective appraisal, contributed to ensuring dependability (Long & Johnson 2000:30; Shenton 2004:63).

Confirmability was ensured through construction of an audit trail, by describing the course of the research step by step in order to provide a mechanism for retroactive assessment of the conduct of the study (Shenton 2004:63). The principal investigator's position as member of staff at MakCHS may be considered a hindrance to the creation of valuable social distance, leading to suspicions that the data presented may be his own preferences and not a result of the experiences and perceptions of the participants. This was mitigated by triangulation. Using both qualitative and qualitative methods, and collecting data from a variety of sources and analysing it through various ways reduced systematic errors, verified viewpoints and experiences against each other and, thus, contributed to confirmability (Moran-Ellis *et al.* 2006:45).

3.7   CONCLUSION

Chapter 3 discussed the various methods used and the justification for choosing the methods; and backed the discussion by literature. The study used a mixed methods approach to triangulate the findings. Triangulation was important, because of the variety of study areas and study participants, and the complexity of medical education research. While each of these methods may have its own weaknesses, their use in concert compensates for their individual limitations while exploiting their respective benefits; thus, creating a superior understanding of the research phenomenon. In the next chapter, the results and discussion will be presented.

CHAPTER 4

RESULTS AND DISCUSSION, DOCUMENT REVIEW

4.1 INTRODUCTION

The previous chapter explained the design, paradigm and methods used to collect data. Data generated for this study were collected using various methods because of the complex nature of the phenomenon of interest. The methods included both qualitative and quantitative approaches.

In this chapter, the results of the document review are presented, together with a discussion. The purpose of this document review was to develop an understanding of the undergraduate medical curriculum at MakCHS, to provide background and context, and discover insights relevant to the study by using texts to provide context (cf. point 3.5.1). The sample size and sample selection criteria, as well as the data collection procedure, are explained in Sections 3.5.1.1 and 3.5.1.2.

Cross-referencing will be done to sections that refer to literature quoted in previous chapters. Reference will also be made to literature not quoted previously, but pertinent to the findings. Doing so serves as a kind of triangulation of results, so as to corroborate the findings and achieve a better understanding of the research issue.

4.2 SUMMARY OF PROCEDURE AND FINDINGS

Before commencing with data collection, permission was obtained from the ethical committees of MakCHS (REC REF No. 2015-125); MNRTH (MREC 868); the Uganda National Council for Science and Technology (SS 3935); and the University of the Free State (ECUFS NR 174/2015) (cf. Appendices E, F, G & H). The head of the Teaching and Learning Committee at MakCHS, who was in charge of the curriculum and student clinical placements, was contacted to obtain a copy of the curriculum and the schedule for the students' clinical placements.

This phase of the study was purely a document review and there were no discussions with the heads of departments or course coordinators, except for requesting that they provide the required documents.

The purpose of the document review was to find information about the curriculum and the way it was being implemented at the workplace, and to discover whether the curriculum and attendant documentation were easy to understand by teachers and students, so that subsequent phases of the research could proceed. These phases involved determining if expectations of the curriculum were being met by the teachers and students at the workplace. Data collection for the document review was done using a matrix forM that was designed to capture certain details that were considered important for teaching and learning in the workplace (cf. point 3.5.1.2).

According to the curriculum, fourth-year medical students are allocated placements at the workplace in MNRTH in seven different clinical departments, namely Internal Medicine, Surgery, Paediatrics and Childhealth, Obstetrics and Gynaecology, Anaesthesia, ENT, and Ophthalmology, while those in their fifth year are allocated placements in four departments, namely, Internal Medicine, Surgery, Paediatrics and Childhealth and Obstetrics and Gynaecology. The courses taken by the fourth- and fifth-year medical students are similar to a placement at the clinical department where they are allocated. For example; the course Ophthalmology is presented in the department of Ophthalmology; Obstetrics and Gynaecology is presented in the department of Obstetrics and Gynaecology, etc.

The document review was done separately for fourth-year and fifth-year courses, though the results are presented in together, with reference to the **learning objectives** and four of the nine domains of competence which served as tracer domains for teaching and learning in the workplace (cf. point 3.5.1.3).

The learning objectives are discussed with particular reference to **Bloom's taxonomy** of cognitive skills development. Bloom's taxonomy refers to a classification of cognitive skills and abilities that a learner is expected to master and demonstrate. The taxonomy is arranged from the lowest cognitive function which require less cognitive processing to the highest, which requires deeper learning and more cognitive processing. The original classification, with six levels of cognitive function (cf. Figure 4.1) has since been revised and renamed/equated in the following way: remember for knowledge, understand for comprehension, apply for application, analyse for analysis, evaluate for evaluation and create for synthesis, with the top two levels interchanged. Bloom's taxonomy is frequently used for the development of learning objectives with each of the levels presenting a sample of verbs to choose from that reflect what the learner is expected to achieve (cf. Appendix

I). Learning clinical medicine is complex and involves a series of steps that help students to progress from the level of a novice to that of proficient clinician. While the novice is expected to be familiar mainly with basic facts that require recall, the proficient clinician is expected to synthesise clinical information and apply it to different clinical situations, because no two clinical situations are exactly be the same. This progress is addressed by developing learning objectives based on Bloom's taxonomy with the aim of providing a stepwise approach to learning from basic to complex. If any of the steps are skipped or inadequately addressed, there will be incomplete acquisition of knowledge, skills and attitudes which will, in turn, compromise the quality of learning as well as the ability of the student to transfer concepts learnt to different clinical situations, which is the hallmark of clinical proficiency during patient care (Adams, 2015:152; Austin, 2016:online).
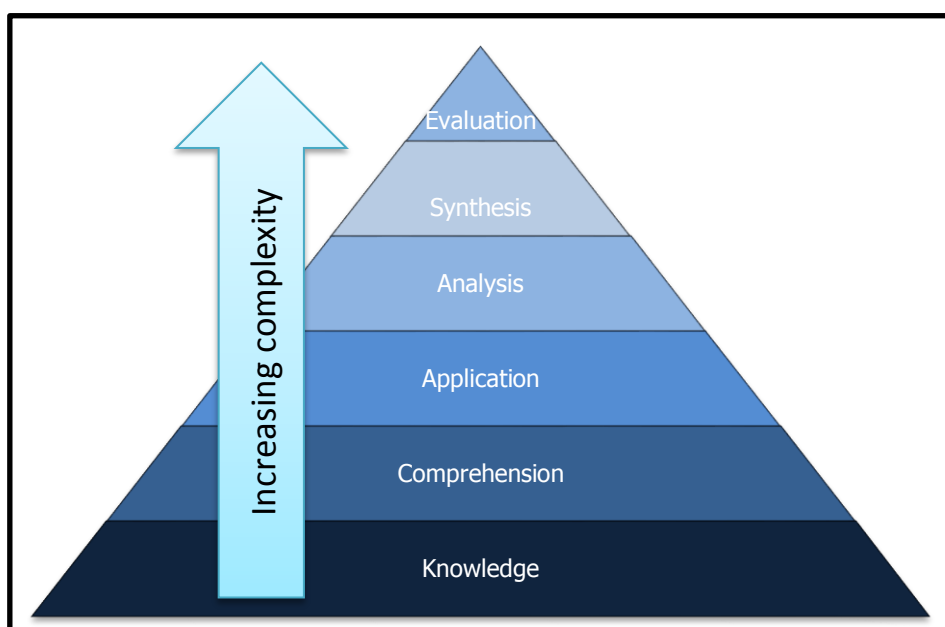
FIGURE 4.1: BLOOM'S TAXONOMY OF COGNITIVE FUNCTION (Adapted from Adams 2015:152)

4.3   RESULTS AND DISCUSSION

The undergraduate medical curriculum at MakCHS is a competency-based curriculum that identifies domains of competency expected of MakCHS medical graduates (cf. point 2.5). For the purposes of this document review, emphasis was on the **learning objectives** and four of the nine domains of competence which served as tracer domains for teaching and learning in the workplace (cf. point 3.5.1.3). The choice of these tracer domains was based on literature about evidence-based models of workplace learning by medical students, which identify context, processes and outcomes as major drivers of workplace learning

(Browne 2007:113; Hay, Smithson, Mann & Dornan 2013:58). Context consists of curriculum factors, such as learning objectives, and human interactions, which could be equated to interpersonal and communication skills. Processes refer to supported participation, which includes clinical skills and patient care, while desirable outcomes of the graduates require motivation and development of a sense of students' professional identity, which can translate to professionalism and ethical practice.

4.3.1 Learning objectives, professionalism and ethical practice

The curriculum documents of all the different courses/departments (cf. Section 2.5), for both fourth- and fifth-year medical students, contain learning objectives. The verbs used include **describe, demonstrate, explain and apply principles**, and **achieve** for the fourth year, while verbs in the fifth-year curriculum includes **apply, discuss, demonstrate ability,** and **provide**. The curriculum expectations for both the fourth and fifth year are similar in relation to cognitive function during learning in the workplace, although fifth-year students were expected to function at a slightly higher level, which is in keeping with Bloom's taxonomy (Adams 2015:152). The focus for fourth-year medical students is on the development of clinical skills in history taking, systematic physical examination, interpretation of signs and symptoms, clinical diagnosis and procedural skills, as well as appropriate professional behaviour, while fifth-year medical students are expected to apply these skills. These findings apply to all the departments where the students are allocated for clinical placement.

The verbs used to operationalise the learning objectives for the medical students in terms of learning at the workplace imply that fourth-year medical students, who are essentially novices, are expected to develop their competence as they progress to the fifth year.

During their application in the curriculum, the operative verbs were used appropriately, according to Bloom's taxonomy (Austin 2016:online). For example, in the **cognitive domain,** which refers to acquisition of mental skills or knowledge, the **learning objectives** and four of the nine domains of competence which served as tracer domains for teaching and learning in the workplace (cf. point 3.5.1.3), keywords used for fourth-year objectives include **explain** and **describe,** while, for the fifth year, the key word is **discuss**. These verbs refer to **comprehension,** which relates to the expectation that the students understand the meaning of certain concepts and can interpret the clinical problem,

state it in their own words while making presentations, and defend their opinions by presenting arguments based on certain criteria.

In the **psychomotor domain**, which deals mainly with acquiring complex motor skills relating to physical movement and coordination of the brain and hands, and leading to imitation and adequacy of performance, the verbs used for both fourth and fifth-year objectives include **demonstrate** and **apply.** These verbs refer to the level of **application,** which requires that the student uses the learned concepts to solve problems in a new situation, i.e., can apply what was learned in the classroom to new situations in the workplace (Adams 2015:152).

In the **affective domain**, which refers to the development of feelings or **attitudes**, the focus is on **demonstration** of appropriate professional behaviour. The affective domain contributes to the development of **professionalism and ethical practice** as the concern here is the development of attitudes. The verb, **demonstrate,** is used in the curriculum where competence in the affective domain is expected (i.e. the manner in which things are dealt with emotionally involving feelings, values, appreciation, motivation and attitudes). The expectation is that students attach certain positive human values, such as respect, empathy, courtesy etc. to a particular behaviour, internalise and express these values in overt ways that are identifiable in their day-to-day interaction with patients, the patients' relatives/attendants and professional colleagues such as doctors, nurses and the other support staff. While it is recommended that students acquire these desirable attributes during student learning, these attributes and values cannot be taught in a formal way, but must be modelled by the teachers at the workplace while the students observe and learn (Hafferty 1998:403; Hafler *et al*. 2011:440; Le Clus 2011:355; Pimmer, Pachler & Genewein 2013:463).

Whereas **demonstration** of appropriate professional behaviour is a curriculum objective for both fourth- and fifth-year medical students, the expectation is usually that the students transition from simple acceptance of the values attached to a behaviour during their fourth year, to a more complex commitment to day-to-day expression of the behaviour in their fifth year, as part of the transition from a student identity to that of a qualified doctor (Price, Price, Williams & Hoffenberg 1998:110; Pimmer *et al*. 2013:463).

In terms of competence development, fourth-year medical students are mainly expected to exhibit a level of competence that proves **"know how",** according to Miller's pyramid of competence – this is a level lower than the expectation of fifth-year students, who are expected to **"show how**" and, later, **"do",** once they qualify as medical doctors (cf. point 2.4). Some of the objectives contained in the fifth-year year curriculum are similar to those in the fourth-year curriculum. Students are expected to demonstrate competence regarding the same attributes, but at different levels, which is understandable, since competence development is described as requiring constant practice, is incremental, not static, and context-dependent (Epstein & Hundert 2002:226, Pimmer *et al*. 2013:463).

4.3.2   Medical knowledge

The undergraduate curriculum at MakCHS, which is implemented in three phases provides a foundation of medical knowledge that involves, first, an introduction to the normal structure (anatomy) and function (physiology) of the human body, followed by exposure to pathophysiology, and, finally, gaining clinical experience in the workplace (cf. point 2.5). As the student progresses towards the final year, classroom-based teaching is kept to a minimum, with emphasis being put put on workplace learning. The residual classroom sessions provide the background knowledge the students need to appreciate the concepts underlying the skills and attitudes displayed, and the clinical decisions made by the clinical teachers while they take care of the patients at the workplace. During classroom sessions, knowledge is presented, discussed, clarified and assessed.

The curriculum review indicated that all courses in the fourth and fifth years offered classroom-based sessions in the form of tutorials, seminars and expert resource sessions. All these didactic sessions had clear schedules that indicated the time, venue, responsible tutors and student facilitators. The schedules of the different departments were arranged in such a way that students were fully occupied all the time without the schedules conflicting with each other.

The didactic sessions prepare students for the clinical sessions by helping them to find relevance in the medical knowledge they acquire. Without the foundations of medical knowledge, the students find it difficult to integrate knowledge with clinical application (Naritoku, Vasovic, Steinberg, Prystowsky, & Powell 2014:316). Studies have demonstrated that students in their clinical years perform better on test scores when clinical teaching is

accompanied by didactic sessions (Menkes & Reed 2008:8). Regarding this aspect, the implementation of the curriculum was, therefore, meeting expectations for teaching and learning in the workplace.

4.3.3 Clinical skills and patient care

Clinical sessions or bedside teaching should, ideally, be the core method of instruction for teaching and learning in the workplace; it is a vital component of medical education, especially when medical students are approaching qualification as medical doctors. During clinical sessions, student not only learn about patient care, but communication and interpersonal skills too. During the patient encounter at the bedside, the teacher plays the dual role of diagnosing the patient based on the clinical findings presented by the student, as well as diagnosing the student's competence level based on expressed knowledge, observed interpersonal skills and communication, physical examinations skills and clinical decision-making skills exhibited (Nilsson, Pennbrant, Pilhammar & Wenestam 2010:9).

During clinical sessions, competence is developed along a continuum, from observer status, to assistant, to performance under supervision and, finally, independent performance. This progress is critical during the training of medical students while they are being supported during their transformation, from a student identity to that of a physician (Pimmer *et al*. 2013:463; Price *et al*. 1998:110).

Effective clinical skills training requires scheduled sessions with clear guidelines indicating topic, dates, venue, time and responsible teacher for each clinical session as opposed to opportunistic learning sessions (Salam *et al*. 2011:online) Opportunistic learning is defined as that type of learning in the workplace that, although intentional by virtue of the fact that there is a teacher, a student and a patient, is near-spontaneous and occurs in the middle of an activity, such as a ward round, a procedure or an operation (Eraut 2004:247).

Of the seven departments where fourth- and fifth-year medical students attended clinical placement, only two – Obstetrics and Gynaecology, and Paediatrics and Childhealth – had detailed schedules for clinical/bedside sessions. The other departments relied mostly on opportunistic learning.

In the two departments that had schedules for bedside teaching, the clinical sessions were designed to fit in with the weekly schedule of activities at the workplace, such as the clinics, major ward rounds, theatre, specialised units, such as Neonatal Intensive Care Unit and Nutrition Unit, and emergency wards, such as the Labour ward, Gynaecological emergency and the Acute care unit for paediatrics.

Clarity about the teaching schedules and learning opportunities indicated above is important for helping teachers and students understand where they are expected to be during teaching and learning at the workplace. Where clarity is lacking, students waste a lot of time trying to find out where they are expected to be at any particular time. This complaint was expressed by students during the focus group discussions, as will be indicated in Chapter 5. It was taken as a given that teachers and students knew where they had to be for particular learning activities, probably because workplace learning has been done routinely, albeit without proper organisation, and this knowledge had become part of the hidden curriculum – a sort of institutional knowledge assumed to be known by all teachers and students (Hafferty 1998:403; Hafler *et al*. 2011:440). However, this assumption can cause confusion, especially for new students at the beginning of their clinical placement, and new faculty.

In the Department of Obstetrics and Gynaecology, fifth-year medical students had comprehensive ward teaching scheduled twice a week, with selected topics, dedicated teachers and students for each session. For both fourth- and fifth-year medical students, there were scheduled bedside/skills demonstration sessions in various learning areas, such as abdominal palpation in the antenatal clinic, pelvic examination of a mother in the labour ward, neonatal resuscitation in the skills lab, manual removal of the placenta in the skills lab, and visual inspection with acetic acid in gynaecological outpatients.

The Department of Paediatrics and Childhealth allocated all the fourth- and fifth-year medical students to various wards (also known as firms). While on these firms for their clinical placements, students were given clear instructions to rotate in the Acute Care Unit (the paediatrics emergency unit where all new admissions are made) whenever their allocated firm was on duty. Although the schedule did not indicate a dedicated teacher responsible for teaching the students while they were in the Acute Care Unit, it was probable that specialists on emergency duty did the teaching opportunistically, which is quite appropriate in the emergency setting (Green & Chen 2014). Teaching and learning in

emergency settings can be achieved using the one-minute preceptorship or micro-skills teaching model (Ramani & Leinster 2008:347; Sajjad & Mahboob 2015:1272).

The Department of Paediatrics and Childhealth had scheduled bedside teaching sessions every morning, specifying the venue, topic and teacher responsible throughout the semester. Additionally, a list of suggested topics for case presentations and write-ups and self-directed learning was available to act as a guide for students. There was, however, no evidence that the Department of Paediatrics and Childhealth used the skills lab for skills training of undergraduate medical students.

The Department of Surgery (which included orthopaedics, neurosurgery and cardiothoracic surgery placements) had a schedule for allocation of students to the various subunits, each with a coordinator responsible for the students, but no clinical/bedside sessions were specified for either the fourth- or fifth-year medical students. The fifth-year medical students, however, had a well-designed essential surgical skills training programme twice a week that was conducted in the skills lab. The type of skill to be demonstrated, teacher responsible and requirements were clearly spelled out. The skills demonstrated included knot tying, scrubbing, skin preparation, laparotomy, repair of intestinal laceration, colostomy formation, Cardio Pulmonary Resuscitation, chest tube insertion, adult/paediatric endotracheal intubation, urinary catheterisation, use of filliforms and suprapubic cystostomy. While this is a good innovation and ensures that students acquire skills during training in surgery, the learning schedules did not clearly specify when and whether the students had dedicated/scheduled opportunities to apply these skills on real patients.

The skills lab provides a safe environment for novices to practice competence development without worrying about making fatal errors (Akaike *et al*. 2012:28). During skills training in the lab, students acquire psychomotor skills, clinical decision-making skills and communication skills. The use of anatomic models, non-human specimens, such as the bovine heart to simulate the uterus and goats' hooves to simulate lacerations, as well as human actors and case scenarios, has several advantages. In the skills lab, there is minimal concern about harm or inconvenience to patients when mistakes occur, and the tasks can be repeated several times in order for the student to perfect a skill. It is also possible to interrupt a skill demonstration in the lab to engage in further discussion about a particular point without risking adverse outcomes. While simulation-based medical education (SBME) is beneficial for competence development, from being a novice to becoming a proficient

physician, it cannot replace real patient encounters, because real patients present with real problems, which sometimes cannot be imagined or equated to the scenarios used during skills training in the lab. The principle of **"see one, do one"** during skills training for medical students has been criticised because of concerns about patient safety. Simulation-based medical education is aimed at addressing the concern about patient safety to ensure that, by the time students "do one", there is some degree of certainty about their competence (Akaike *et al*. 2012:28; Kotsis & Chung 2013:1194).

The Department of Internal Medicine had a schedule for laboratory procedures, indicating topics, venue and teacher responsible, but no schedule for bedside sessions for either fourth- or fifth-year medical students. This implies that clinical teaching in this department was opportunistic throughout the duration of students' clinical placement. Opportunistic learning is, however, fraught with challenges, such as time constraints, short patient stay, lack of clear learning objectives and poor student participation due the large number of students (Gat *et al*. 2016:online) On the other hand, opportunistic learning has advantages, in that, if the teachers are familiar with the one-minute preceptorship model of clinical teaching, every patient encounter is considered to be a learning opportunity (Sajjad & Mahboob 2015:1272).

The other three departments namely, Anaesthesia, Ophthalmology and ENT, which offered fourth-year courses, had no specified schedule of clinical sessions during student placement at the workplace, though the students were expected to assist/perform procedures, which were recorded in a logbook. While the curriculum for the ophthalmology and anaesthesia courses indicate that students are expected to practise and assist at five procedures, which would be recorded in a logbook, the types of procedures was not indicated. The curriculum for the ENT course indicated neither the types of procedures nor the minimum number required for the students to observe, assist or perform while rotating and before they would be considered fairly competent for this level. This lack of clarity could probably be explained by the fact that students spend very little time in these departments.

The clinical teaching schedules or lack of them do not necessarily reflect the true picture of what and how teaching of and learning by undergraduate medical students happens in the different departments. While these schedules are indicated on paper, what really happens at the clinical placement may be different.

Opportunistic learning which is quite prevalent in the workplace during undergraduate teaching at MakCHS contrasts with scheduled learning, where there is protected time, space, and a dedicated teacher with a clear workplace-based goal and activity schedule, which is aimed at transferring and acquiring new knowledge. The opportunistic approach to teaching and learning has many drawbacks in as far as competence development and assurance of achievement of the desired learning goal and objectives are concerned (Norcini & Burch 2007:855; Ramani & Leinster 2008:347). While opportunistic learning provides the advantage of variety and spontaneity, and makes learning a part of everyday life (because every activity is labelled as a learning opportunity), it is difficult to track what has been learnt by the student and raises questions relating to objectivity in assessment, as there may be no system to ensure that all students are exposed to similar learning opportunities (Morris 2010:48; Magnier *et al*. 2011:online). Another challenge posed by opportunistic bedside teaching is that there is usually no planning, which should, ideally, form part of clinical teaching (Gat *et al*. 2016:online).

The differences in implementation of the undergraduate curriculum in various departments may be an indication of the varied skills of the teaching staff in these departments. While all teachers involved in teaching undergraduates possess postgraduate qualifications, some departments have teachers who have undergone specific training in medical education.

4.3.4 Assessment

Student assessment drives learning, and the educational effect of a curriculum is based on the knowledge that specific assessment methods motivate students to direct their study efforts in accordance with the curriculum requirements or desired outcomes. If the curriculum objective is to increase knowledge, then a written assessment could motivate students to study from books in the library, whereas, if the assessment is to test clinical skills, such as the long case exams, short case exams and OSCE, the students will be encouraged to interact more with patients (Norcini & McKinley 2007:239).

Because teaching and learning at this level takes place at the workplace, it is important that workplace-based assessment methods are chosen. Workplace-based formative assessment serves as an instrument for providing feedback to students, to improve their learning and direct their learning towards the desired outcomes which would be pointed out regularly during training (Norcini & Burch 2007:855). The role of summative assessment, on the

other hand, is to identify those students who should progress from one level to the next, based on their demonstration of competence achievement. For the fifth-year medical students who are in their final year of medical school, the aim is to provide assurance to patients and regulatory bodies about the competence of the medical graduates and the safety of the patients under their care (Epstein & Hundert 2002:226; Norcini, Brownell, Bollela, Burch, Joa˜ O Costa, Duvivier, Galbraith, Hays, Kent, Perrott & Roberts 2011:206).

Data on assessment was collected based on the curriculum document, which indicated that course assessment is done in two parts: formative assessment contributes 40% to the overall mark, and summative assessment contributes 60%.

There was explicit information in the curriculum on how assessment had to be done for all the courses offered in the fourth year, except for ENT and Anaesthesia. The methods of formative assessment included written mid-semester exams, presentations during tutorials and on the wards, ward and laboratory procedures, feedback during clinical contact time, logbook entries in the form of procedures performed and skills acquired, case write-ups, peer and supervisor feedback, and use of the portfolios. There was, however, no uniform formative assessment method prescribed across the board, consequently the various departments chose methods to use from the above arsenal.

In the case of Anaesthesia, the curriculum stated the methods of assessment as written exams, logbook entries and OSCEs, but was silent on which of these methods were formative and which were summative. The same situation existed in ENT where it was not clear what form the summative assessment would take. The ENT Department, however, had more options for formative assessment, namely, attendance, punctuality, presentations, ward work and participation in various activities which is assessed via entries in a logbook and contributes 30% and case write-ups, which contribute 10% to the overall formative assessment mark of 40%.

4.4   CONCLUSION

In this chapter, the results of the document review of the undergraduate medical curriculum at MakCHS are presented and discussed. The review focused on the **learning objectives** and four of the nine domains of competence, that is, **professionalism and ethical practice, medical knowledge, clinical skills and patient care,** and **assessment.** The

literature about evidence-based models of workplace learning was used to select tracer domains used in the document review.

The next chapter will present and discuss the findings of the DREEM and focus group discussions with students concerning their experiences and perceptions of the workplace as a teaching and learning environment.

CHAPTER 5

RESULTS AND DISCUSSION: THE CLINICAL LEARNING ENVIRONMENT AS PERCEIVED BY THE LEARNERS

5.1 INTRODUCTION

In this chapter, the results of the adapted DREEM and the focus group discussions are presented, together with a discussion of the results. This data was generated through interactions with the students of MakCHS who completed the DREEM questionnaire and participated in the focus group discussions. The adapted DREEM questionnaire was administered before the focus group discussions. All fourth- and fifth-year students, including those who had completed the DREEM, were eligible to participate in the focus group discussion, as this afforded them an opportunity to express, in more detail, views about the workplace as a teaching and learning environment, which they could not do during the DREEM questionnaire, because of its closed nature.

Literature quoted in Chapters 2 and 3 will be cross-referenced and literature not previously quoted will be introduced as new references in the text.

The DREEM is a validated tool for assessing the learning environment (cf. point 3.5.2.3). The focus group discussions were conducted with the help of a qualitative research methods expert, who used a focus group discussion guide (cf. point 3.5.2.4). Questions additional to the preliminary focus group discussion guide were generated from findings of the DREEM questionnaire.

5.2 SUMMARY OF PROCEDURE AND FINDINGS

The adapted DREEM was administered to all undergraduate medical students who were in their fourth or fifth years at MakCHS. The DREEM is a self-administered questionnaire with 50 items and requires students to select response options on a Likert scale (cf. Appendix J).

There were 130 students in their fourth year and 128 students in their fifth year, giving a total of 258 potential participants. Altogether 216 questionnaires were sent to the

undergraduate students who were involved in clinical rotations at the workplace during the study period. The students who were rotating in Psychiatry (Butabika Hospital) at the time of data collection did not receive questionnaires and were excluded, because they were not at MNRTH at the time of data collection (cf. point 3.4). A total of 170 students completed the questionnaire, giving a response rate of 78%. This response rate was similar that reported in other studies (Omer Tontu 2010:104; Schoeman, Raphuting, Phate, Khasoane, & Ntsere 2014:143; Whittle *et al*. 2007:online).

A pilot study was done with 10 students attending a tutorial in the Department of Obstetrics and Gynaecology. The purpose of the pilot was to identify gaps, such as unclear terms, as well as the time required to complete the DREEM questionnaire. There were only two questions that required clarification: Question 15, the word "ridicule" was clarified to mean "make fun of", with the explanation placed in brackets; and. Question 48, in which the word "social amenities" was replaced with "places of convenience". The time required to complete the questionnaire was determined to be 15 minutes.

The questionnaires were delivered to the students by a research assistant who was part of neither the teaching staff nor the student body, but was familiar with the medical school and the students (an office assistant in one of the departments who deals mainly with photocopying and computer services). This procedure was followed to create valuable social distance between the researcher and the students, so as to minimise undue pressure on the students and encourage them to respond freely.

5.3   RESULTS AND DISCUSSION

All 170 questionnaires were analysed and the results are presented for discussion. The results of the DREEM are presented as frequencies and means that were calculated for students' perceptions of the workplace as a learning environment. The frequencies were calculated as scores relating to the **overall** learning environment, and for the five sub-scales of perception of the learning environment. The five sub-scales of perception of the educational environment are **perception of learning, perception of teachers, academic self-perception, perception of atmosphere** and **social self-perception** (cf. point 3.5.2.4). The results of the analysis of the findings are presented below, together with the discussion.

While assessing the overall teaching and learning environment, the maximum score obtainable is 200, which indicates an ideal educational environment; 100 indicates an educational environment viewed with considerable ambivalence by students and which needs improvement, and a score of 0, the minimum, is a very worrying result as it would reflect a learning environment with major issues that need urgent attention. Further breakdown of the scores was given in Chapter 3 (cf. point 3.5.2.4).

Items in the DREEM can also be analysed individually by calculating the mean scores. The mean scores obtained from responses to the DREEM help to pinpoint specific strengths and weaknesses per item within the teaching and learning environment. The guide suggests that, at this level of analysis, items with a mean score of 3.5 and above indicate real positive points, those with mean scores between 2 and 3.5 indicate aspects of the environment that need to be improved, while items with a mean score of 2 or less are taken to indicate real problem areas that require closer examination (cf. point 3.5.2.4).

Examination of the mean scores of responses to the DREEM showed that there were few items with mean scores above 3.5, and the upper cut-off was therefore adjusted so that 3.0 and above indicated real positive points. Accordingly, the score for aspects of the environment that needed to be improved was set to between 2 and 3.0, and items that scored 2 remained unchanged. It was not envisaged that this adjustment would create a significant inconsistency, as it is in line with the DREEM scoring assignment, where a score of 3 is assigned to the option, Agree, on the Likert scale (cf. point 3.5.2.4).

5.3.1   Overall perception of the teaching and learning environment

Overall, the majority of the students (75.1%) viewed the learning environment as having more positives than negatives (cf. Figure 5.1). This attitude is comparable to results obtained in studies about the educational environment at other medical training schools (Bakhshialiabad, Bakhshi & Hassanshahi 2015:195; Schoeman *et al*. 2014:143; Veerapen & McAleer 2010:online).
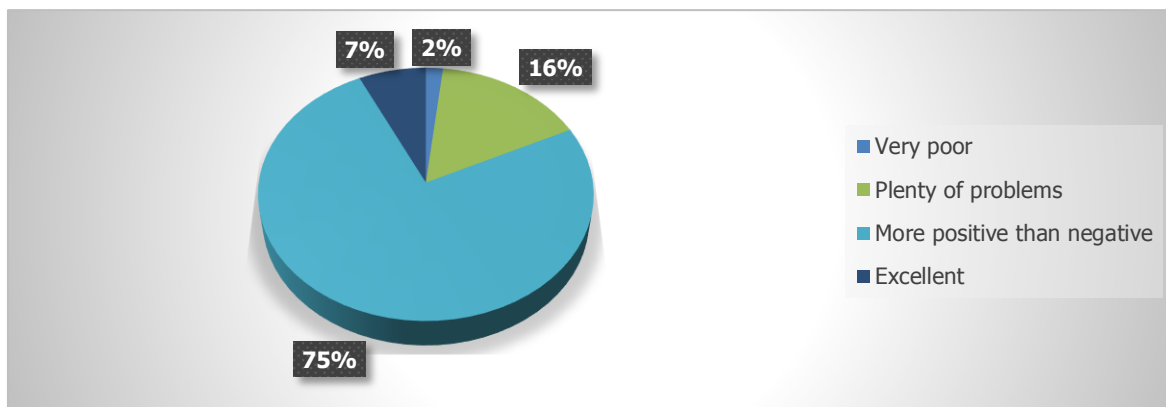
FIGURE 5.1: OVERALL PERCEPTION OF THE LEARNING ENVIRONMENT

The results of the DREEM gave a snapshot of students' perceptions of their learning environment, but did not provide information about the concerns underlying the high or low scores (Whittle *et al*. 2007:online). In the focus group discussions with students, an attempt was made to explain the DREEM findings. The results of the focus group discussions substantiated the positive assessment shown by the DREEM scores. Students, who viewed the learning environment as mostly positive, mentioned access to patients, who are a learning resource. This view is illustrated by the following quotes.

> *For Mulago as a teaching hospital, the patients are there with all sorts of diseases, so we get the exposure which is a bonus and they want you to attend to them so you can never say you don't have a patient, they are always there, they are always wanting someone to listen to them.* – **Student focus group discussion, fifth year**.
>
> *About the working environment here, am very positive about it that there is opportunity to learn, because in Mulago, which is a national referral hospital, we get all kinds of patients and conditions, so there is a very big opportunity to learn so that's the good thing.* – **Student focus group discussion, fourth year**.

Patient numbers, case mix and access are important factors in workplace learning (Garout, Nuqali, Alhazmi & Almoallim 2016:261; Pimmer *et al*. 2013:463). Working with patients helps the students experience professional practice first-hand, and makes learning more authentic, because the students gain knowledge, skills, attitudes and confidence from participating in actual patient care (Magnier *et al*. 2011:1; Ramani & Leinster 2008:347). This learning is important for development of competence during the transition from the student identity to that of clinical practitioners. The importance of patients in clinical teaching can be summed up by this quotation attributed to Sir William Osler, one of the greatest clinician-teachers:" To study the phenomena of disease without books is to sail an

uncharted sea, whilst to study books without patients is not to go to sea at all" (Salam *et al*. 2011:online).

A small percentage of students viewed the learning environment negatively: 16% of the students perceived the learning environment as having plenty of problems, and 2% thought it was very poor. In order to improve teaching and learning at the workplace, the students whose perception of the learning environment was negative should not be ignored. In the focus group discussions students commented about areas that needed improvement, and provided an indication of the issues that provoked negative perceptions of the learning environment among the students. The following themes emerged from the focus group discussions.

a) Overcrowding

Most policy makers want medical schools to increase their student intake to meet the ever-increasing demand for health workers. This demand is not, however, usually accompanied by provision of sufficient infrastructure, and one of the challenges facing teaching and learning at the workplace is increasing numbers of students (Gat *et al*. 2016:online). Large numbers of students and occasional lack of clarity on their roles during bedside sessions demotivates students from participating in bedside sessions, especially during ward rounds involving different levels of students (Morris 2010:48). This phenomenon requires innovative solutions to decongest the learning environment and to provide sufficient opportunities for all students to participate in activities at the workplace. One way that has been suggested is to split the student group into smaller groups that are handled by different teachers; however, the challenge is the limited number of teachers available at any one time to allocate to different student groups. Alternatively, other teaching platforms, such as satellite hospitals, not only the national referral hospital, was tried by the University of Nairobi for undergraduate clinical placement (Kibore *et al*. 2014:170).

> *Now, for me, those clinicals, first of all we were so many, you had to be extremely vigorous as you fight to view and you have to stand. As for me I think I wasn't so aggressive and I reached a point when I would just sit. When people are done I just ask someone," What did they say?" And you find one person heard half way, another one heard another version and another one also heard another version. –* **Student focus group discussion, fourth year.**
>
> *You find that there are so many of us; senior house officers, fifth-years, and you the fourth*

years; you are the underdog, you are the lowest in the food chain, and you sometimes have to stand somewhere far from the patient's bed because the whole place is packed, they are doing something and you can't see and you learn nothing. – **Student focus group discussion, fourth year.**

b) <u>Workplace affordances</u>

Tasks and activities, relationships and interpersonal dynamics, and rules and norms of practice that support participation in the workplace have been variously described as workplace affordances or engagement opportunities, and they are significant factors in workplace learning. An environment that has invitational qualities, such as encouraging students to ask questions, and teachers demonstrating positive thoughts and feelings towards the students, is associated with better competence achievement (Chen *et al*. 2016:203). Teachers need to be friendlier, have good communication skills to answer questions in a nonthreatening manner, and encourage students to be proactive participants in learning (Garout *et al*. 2016:261; Sutkin, Wagner, Harris & Schiffer 2008:452). When teachers are friendlier, the students are motivated to participate in learning activities at the workplace, which is central to acquisition of competence, since clinical medicine is learnt by practicing (Kohl-Hackert *et al*. 2014:12).

Another thing that prevents us from going forward in line with taking those chances is, as I said before; fear always prevents us from doing so. Yes, the opportunity is there, it is just sometimes like you want to learn something and people who are to teach you are there but what if they are rude to you and you are like, I think I will ask someone else. – **Students focus group discussion, fourth yea.r**
There are some who trash what you say, you know introducing something and then someone will tell you, that it is wrong, but they do it in kind of a polite way and then they try to correct you but some of them start shouting," That is very wrong! Ooh my God you are so stupid, our generation of doctors was better, you want to kill our patients!" – **Student focus group discussion, fifth year.**

Other health practitioners, such as nurses, paramedics and laboratory personnel, also contribute to workplace affordances, and they need to be supportive of the students. However, it does not appear to be the case, as expressed by the students in the following quotations.

I think there is a problem with the nurses and yet there is a lot we can also learn from

them. I realise that there is this attitude they have about students, I think they are not aware. If you ask for any help, they don't want to help. They tend to keep away everything you are supposed to use on the ward; the gauze, the vacutainers, the gloves, so you sort of have to beg all the time and yet they have this attitude that won't encourage you to go on. – **Student focus group discussion, fifth year.**

Yes, because some of them are really very unfriendly, they are already biased, like I went to some clinic and the nurse said, "These medical students want to behave as if they are doctors". It is really our first day there and we do not know what to do, so how can we behave like doctors? Then I tried asking another one and she put me off and told me to wait for our doctors to teach us. So, for example, I might come and maybe there are no doctors, does that mean I cannot be taught? So, your day is gone, so it is not nice at all. – **Student focus group discussion, fourth year.**

c)   <u>Shortages of equipment and supplies</u>

Most textbooks prescribed for medical students are written by authors from well-resourced settings. If the situation the books describe differs from what is on the wards, it may be the result of occasional shortage of supplies and equipment, especially in low-resource settings.

Under-resourced settings face further challenges, such as inadequate space for continuing discussions after the patient encounter (Sajjad & Mahboob 2015:1272). Availability of conference rooms for further discussion after a bedside session are critical for deeper learning. It is at this time, that is, after the patient encounter, that students and teachers discuss more sensitive details concerning the patient, such as differential diagnosis – the" what if" question, prognosis and options for management (Gat *et al*. 2016:online).

I think the teaching environment is a bit far from ideal because you may read something in the books and then you come and find something totally different being practiced and it's always hard. You may forget what you read and erase the right thing from your head and just remember practices that you see every day, like the environment is a bit confusing. – **Student focus group discussion, fifth year.**

5.3.2   Perception of learning

In terms of **perception of learning** as a sub-scale of the learning environment compared to the overall perception, the percentage of students who had more positive perceptions of

learning reduced from 75% to 67%. This decline is compensated for by an increase in the number of students whose perception of learning in this environment was excellent; this score increased from 7% to 23% (cf. Figure 5.2).
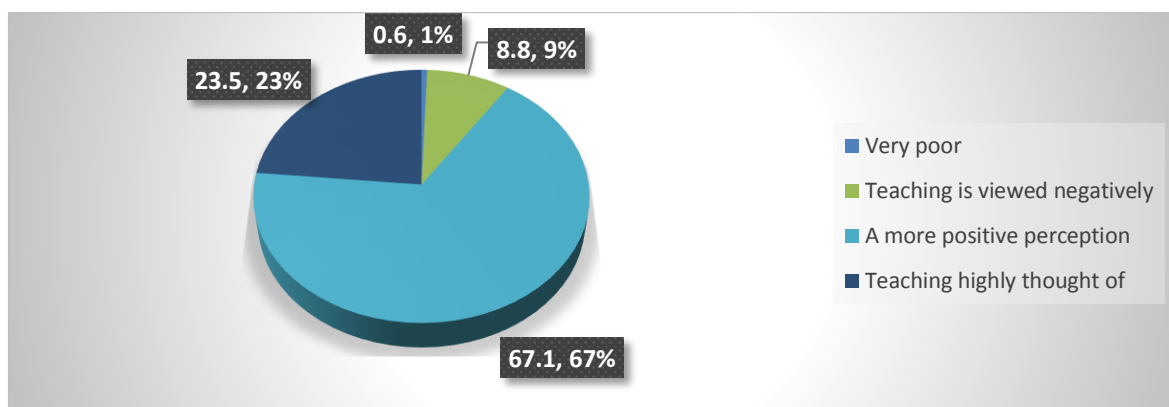
FIGURE 5.2: PERCEPTION OF LEARNING

The results of this sub-scale were subjected to statistical analysis to calculate the mean scores of the various attributes of the workplace (cf. Table 5.1). Out of the 12 items on this sub-scale, five items (42%) had mean scores above 3.0, indicating real positive points about the students' perception of learning. The five items that had mean scores between 2.0 and 3.0, implying areas that needed looking into with a view of improvement, included," The **teaching is well focused", "The clinic time is put to good use", "I'm clear about the learning objectives", "The teaching encourages me to participate"** and **"Lifelong learning is emphasised over short-term learning".** This finding is similar to findings in a study done in India (Pai, Menezes, Srikanth, Subramanian & Shenoy 2014:103). The message for teachers is that students would like a more focused approach to teaching, would like clinic time to be utilised better, and would like to obtain clarity about learning objectives. They would like to have more hands-on practice during the clinical placements, and more emphasis on lifelong learning, as opposed to short-term learning.

The item, **"The teaching over-emphasises factual learning"**, had a mean score of 1.33, which is less than 2, and, thus, indicates a real problem area that needs to be examined more closely. According to Bloom's taxonomy of cognitive learning, emphasis on factual learning takes place at the very basic level, when students are beginners. As they progress through the years of medical school, towards the final year, and finally into clinical practice, the students need other learning approaches, which requires students to apply, analyse or synthesise information or concepts learnt in the classroom to the patient situation (Adams 2015:152; Austin 2016:online).

TABLE 5.1: MEAN SCORES FOR PERCEPTION OF LEARNING

ITEM	MEAN SCORE
I am encouraged to participate during clinical learning sessions	3.28
The clinical teaching is often stimulating	3.07
The teaching is interactive between teacher and student	3.09
The teaching helps me to develop my skills	3.03
The teaching is well focused	2.77
The teaching helps me to develop my confidence	3.15
The clinic time is put to good use	2.53
The teaching over-emphasises factual learning	1.33
I'm clear about the course learning objectives	2.63
The teaching encourages me to participate	2.99
Lifelong learning is emphasised over short-term learning	2.94
The teaching is too teacher controlled	2.19

These findings could be interpreted to mean that the environment is supportive of teaching and learning. Factors that may facilitate learning at the workplace include the availability of **patients** with a wide array of clinical conditions who are willing to be a part of the teaching and learning process on the wards, the availability of **teachers** who are knowledgeable and ready to share their knowledge, and **students** who are eager to learn. This makes the learning triad complete (Garout *et al*. 2016:261). This is illustrated in the following quotes from students.

> For Mulago as a teaching hospital, the **patients** are there with all sorts of diseases, so we get the exposure, which is a bonus and they want you to attend to them so you can never say you don't have a patient, they are always there, they are always wanting someone to listen to them. – **Student focus group discussion, fifth year.**
>
> The **consultants [teachers]** I found they want to teach you, they take their time. "Come and observe this, look through the microscope." Okay you will not have hands on this, but you feel attended to, you feel they are trying to help you, okay, like we do not do the surgeries no surgeries in ophthalmology but you feel they are trying to help you and these are consultants and you really feel so nice." – **Student focus group discussion, fourth year .**
>
> And I think the evaluation is seen out there, there are some **[students]** who are terrible out there, but there are others who are very good because the exposure was good enough and they took their time to know. – **Student focus group discussion, fourth year.**

Teaching at the bedside can take different forms; from the explicit pedagogical approach to the subtle demonstration of behaviour through role modelling by the teachers, from which students develop problem-solving and clinical reasoning skills (Peters & Ten Cate 2014:76). During clinical teaching, teachers sometimes verbalise their thought processes,

a process known as thinking aloud, which is a powerful way of teaching, especially for the novice student, including undergraduates (Morris 2010:48).

However, there were some students whose perception of learning was negative (9%) or very poor (1%), and their perception is illustrated in the following quotes.

> *I was expecting a lot of teaching, the friendliness, which is something you do not get, we do not get it up here, we are more like on your own, you are left to float.* – **Student focus group discussion, fourth year.**
>
> *It appears like teaching and learning is not a priority, like we are" a by-the-way" so it's like teaching is just a sub-unit of some other activity, so we have to fit ourselves in wherever* – **Student focus group discussion, fifth year.**

5.3.3   Perception of teachers

Most students (63.9%) perceived teachers as moving in the right direction, while 16% perceived them as model teachers (cf. Figure 5.3). This perception appears to corroborate the findings above, about the perception of the learning environment and perception of learning at the workplace, both of which achieved high scores (cf. point 5.2.1 & 5.2.2). A percentage of students (19.5%), however, perceived the teachers as in need of retraining.
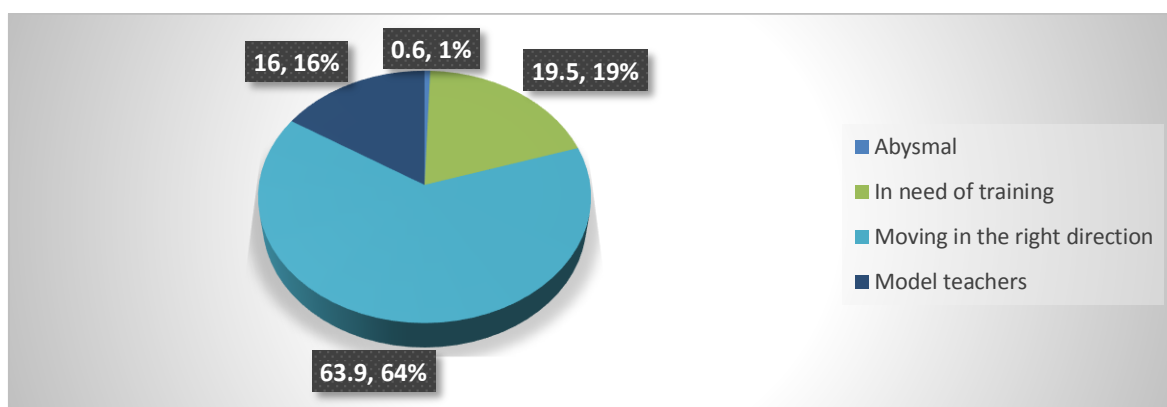
FIGURE 5.3: PERCEPTION OF TEACHERS

Statistical analysis of this sub-scale indicates that only one item out of the 11 had a mean score above 3.0, so only one item reflected real positive points, namely, "The lecturers are knowledgeable". Nine items had mean scores between 2.0 and 3.0, meaning that, as far as the perception of teachers was concerned, the students believed that the teachers needed to improve their skills. The only item that had a mean score below 2.0 was the negative statement, "The lecturers are authoritarian", which had a mean score of 1.80, indicating

that the students agree with the statement – not a very good perception (cf. Table 5.2). The teachers at the workplace therefore need to be more liberal.

TABLE 5.2: MEAN SCORES FOR PERCEPTION OF TEACHERS

ITEM	MEAN SCORE
The lecturers are knowledgeable	3.39
The lecturers promote a patient centred approach to consulting	2.73
The lecturers ridicule (make fun of) the students	2.12
The lecturers are authoritarian	1.80
The lecturers have good communication skills with patients	2.97
The lecturers are good at providing feedback to students	2.24
The lecturers provide constructive criticism	2.80
The lecturers give good demonstrations	2.83
The lecturers get angry during teaching sessions	2.15
The lecturers are well prepared for their classes	2.54
The students appear to irritate the lecturers	2.30

The results above seem to confirm the attitudes of students that the teachers may be in need of further training. The fact that students perceive the teachers to be knowledgeable is a positive point; however, being a good teacher is not about being a content expert. The way that content is delivered may determine the way medical concepts are grasped by the students. The attributes of a good clinical teacher include professionalism and humanism, and neither of these attributes are acquired because someone is a content expert in his/her field; gaining these attributes requires training (Gat *et al*. 2016:online; Kohl-Hackert *et al*. 2014:12). Literature indicates that among attributes expected of a clinical teacher such as ability to teach, interpersonal skills, professional skills and administrative skills, ability to teach was ranked highly by the students (Kiani, Umar & Iqbal 2014:203).

It is evident from Table 5.2 that while the students perceived the teachers as being knowledgeable, the teachers were not rated highly by the students in most of the other attributes, indicated in the table, that make a good clinical teacher. This is probably why the students felt that the teachers are in need of further training, "they should be taught how to teach", as illustrated in the following quotes.

> *About teaching, you find that there are those who can teach but also there are those ones whom you can work with and they don't even utter a single word yet they know you are a student, you are supposed to learn from them, and they are not willing, they are doing their own business and it's like for you when you are there, you are like inconveniencing them or even wasting their time, kind of, yet they are supposed to teach you, one can even end up giving up.* – **Student focus group discussion, fifth year.**

I think some of these doctors have been employed because they excelled in school. Someone can excel academically but when they don't know how to teach, when they don't have the heart to teach so I think it is better for us to have somebody who can teach us whether they are excellent than to have somebody who is so excellent but can't teach. – **Student focus group discussion, fourth year.**

I think the first thing they should do is to first reorient the teachers, the doctors or workers, on their duties besides seeing patients, they should be taught how to teach. We have a lot of people who are very serious and very confident, however, they don't teach us. They should train them every year like in seminars. – **Student focus group discussion, fifth year.**

Literature alludes to the fact that many physicians are experts in their fields, but that their communication-related attitudes and abilities are lacking, which can have a negative impact on students' competence development (Pimmer *et al*. 2013:463). Passionate and professionally trained clinical teachers, grounded in the skills of bedside teaching, including the ability to give non-judgmental feedback, can be good motivators for undergraduate medical students who are struggling to navigate through the clinical workplace (Kohl-Hackert *et al*. 2014:12; Sajjad & Mahboob 2015:1272). Teaching in the workplace requires that the teachers act as good role models of skills and attitudes that may be difficult to teach in a formal way, while balancing the needs of the student and the patient and their own needs, which is referred to as the learning triad (Garout *et al*. 2016:261; Haghani, Arabshahi, Bigdeli, Alavi & Omid 2014:online).

Most of the senior doctors, the very senior doctors, those guys most of them are very humble people, they are down to earth. Some of them treat you like colleagues, and they are really very nice people, very humble but as you come down… I don't know if it's because of the way they were taught many years ago and maybe it is probably the way they were taught that they are now translating, we normally see it with them. I don't know about the doctors that come afterwards there is something that is not right, probably maybe they were traumatised. – **Student focus group discussion, fourth year.**

In most cases, if a specialist finds you, maybe gathered around a particular bed and then they go to the opposite side of the room, they don't mention anything to you but they go and start their business, and when you realise and follow them, maybe you can even say good morning and they don't reply so how can you ask a question? So, you decide, let me just follow. – **Student focus group discussion, fifth year.**

I know a certain doctor who clearly told us," I do not have time so don't even bother looking for me [laughter], don't waste your time, you people go and learn on patients. – **Student focus group discussion, fourth year.**

During workplace learning encounters, the teacher should be able to diagnose the student by assessing and giving feedback in a non-judgmental way about the student's medical knowledge, psychomotor skills and communications skills, and carefully setting boundaries of discussion during the process of diagnosing the patient from the discussions by the bedside (Nilsson *et al*. 2010:1; Salam *et al*. 2011:online). Teachers can achieve these competences of bedside teaching through faculty development.

5.3.4 Academic self-perception

Regarding academic self-perception, 34.7% of the students were confident about performing well, and 50% felt more on the positive side of performing well academically. This gave a cumulative percentage of 85% of students whose academic self-perception was positive, meaning that they were hopeful of performing well, which is a good report (cf. Figure 5.4). The medical school is essentially a community of high achievers, and academic self-perception can be largely dependent on actual individual achievement or through comparison with peers. Academic self-perception also reflects how the students perceive themselves as fitting in the context of the teaching and learning environment (Litmanen, Loyens, Sjöblom & Lonka 2014:1856). That a large percentage of students had a positive academic self-perception is a favourable report for the teaching and learning environment at MNRTH. This high percentage of students who perceived themselves as being capable of performing well could be translated to mean that the workplace at MNTH is supportive of teaching and learning for undergraduates.
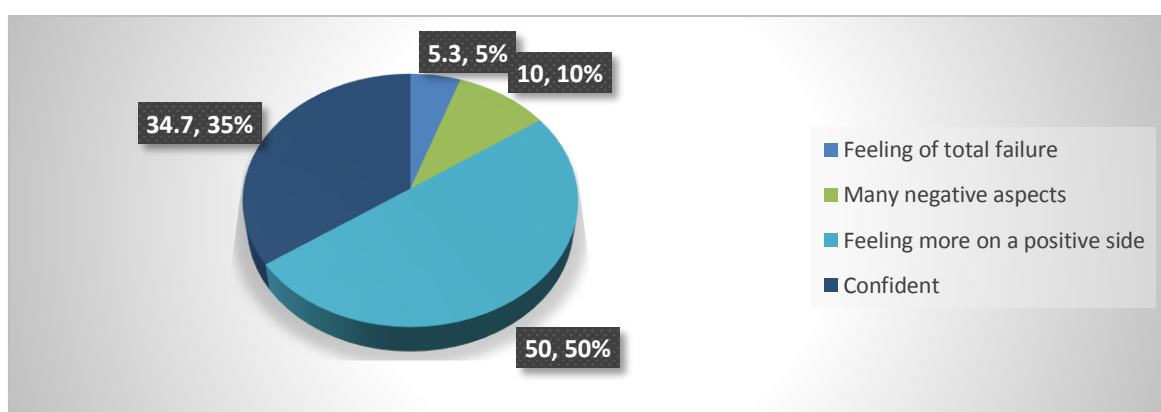
FIGURE 5.4: ACADEMIC SELF-PERCEPTION

This sub-scale returned quite promising results, with four of the eight items having mean scores above 3.0, which indicates real positive points. The remaining four items had mean scores between 2.0 and 3.0, indicating areas that need to be improved, and no item scored

2 or less (cf. Figure 5.3). The item with the highest mean score, of 3.26, on this sub-scale was, "Much of what I have learnt seems relevant to a career in health care", closely followed by "I am confident about my passing this course", with a mean score of 3.2. These findings are similar to the results obtained in a study done in Iran, where similar items had the highest mean scores (Aghamolaei & Fazel 2010:online). The teaching and learning environment has a very important role to play in ensuring the highest possible academic achievement and satisfaction of the students; performing well encourages students to perform to their highest potential. When students perceive that the strategies they have used before still work for them within the context of the teaching and learning environment, it gives them a sense of assurance in their ability to perform and they become more confident (Pai *et al*. 2014:103).

TABLE 5.3: MEAN SCORES FOR ACADEMIC SELF-PERCEPTION

ITEM	MEAN SCORE
Learning strategies that worked for me before clinical placements still work for me now	2.00
I am confident about my passing this course	3.20
I feel I am being well prepared for my profession	3.14
The pre-clinical teaching was good preparation for this year's clinical clerkship work	2.67
I'm able to practice all I need on the ward	2.26
I have learned a lot about empathy in my profession	2.83
My problem-solving skills are being well developed here	3.05
Much of what I have to learn seems relevant to a career in health care	3.26

The small percentage of students (10%) who felt that there were many negative aspects and the 5% who had a feelings of total failure represent a group of students whose expectations had not been met during their placement at the workplace as a teaching and learning environment. This finding may refer to students who believe that the workplace is not supportive of learning, probably because of a perception of inadequacy in the workplace affordances or invitational qualities, since these have been found to be associated with student performance. Workplace affordances go hand in hand with learner agency, that is, the intentionality of the students to learn under the circumstances. Students who have a negative perception of the learning environment are, therefore, likely to associate it with poor learning outcomes (Chen *et al*. 2016:203). For students to benefit during workplace learning, there is need for supported participation and when this support is lacking, acquisition of the necessary competence can be compromised, leading to perceptions of inadequacy in the students (Dornan, Muijtjens, Graham, Scherpbier & Boshuizen 2012:703).

Similar findings were reported in a study done in India and the authors expressed that they would have wanted to explore the reasons behind the low scores using focus group discussions (Pai *et al*. 2014:103). In the present study, the reasons behind the low scores were explored using focus group discussions and the findings are presented in the following quotations.

> *I expected to gain practical skills in addition to enriching my knowledge.* **[Interviewer: Have your expectations been met?]** *I have not yet realised all my expectations, OK, I have gained knowledge, but mostly the practical aspect is a bit lacking, it is still limited. –* **Student focus group discussion, fifth year.**
>
> *I know problem-based-learning is supposed to be more self-driven; we do 80% of the reading and they give us a little of the 10% but then even this 10% they are supposed to give us, they are not giving it, we have to hustle to get the teaching. -* **Student focus group discussion, fourth year.**

5.3.5 Perception of atmosphere

Most students (62.4%) had a positive perception of the learning atmosphere. A large percentage, 29%, however believed that the atmosphere had a lot of issues that needed changing (cf. Figure 5.5).
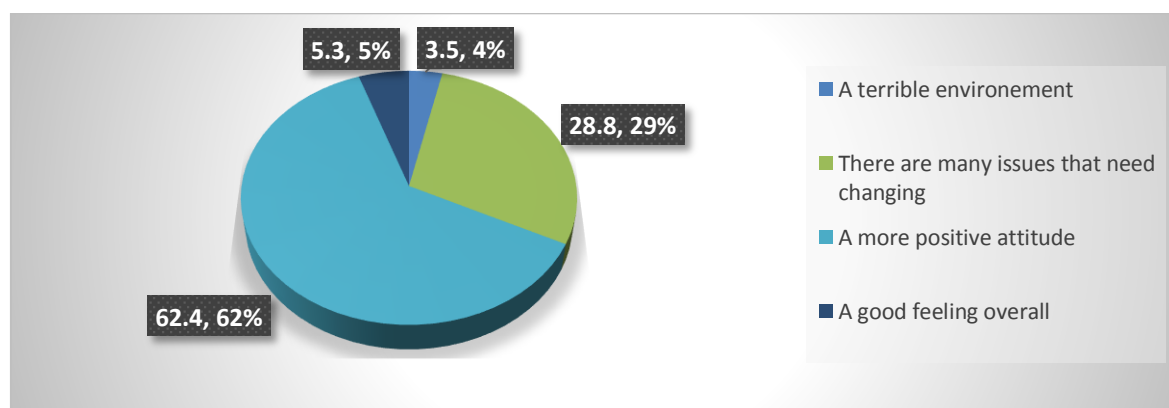
FIGURE 5.5: PERCEPTION OF ATMOSPHERE

The perceptions of students concerning the atmosphere at the workplace as a teaching and learning environment are illustrated by the results for this sub-scale. None of the items scored above 3.0, and three out of the 12 items had mean scores below 2.0, indicating real problem areas that required to be examined more closely (cf. Figure 5.4). The items with mean scores below 2.0 are, "the atmosphere is relaxed during ward rounds", "the course

is well timetabled", and "the enjoyment outweighs the stress of work on the ward". These are the statements that elicited the greatest disagreement from the students, and efforts should be made to address these issues. There were even suggestions by the students on how to improve the situation:

I think they should really observe us when doing these practical things. For me I think for those practical things they should even set a timetable just for them to be effective. If they want us to do normal deliveries let the specialists at least monitor three. **– Student focus group discussion, fourth year.**

I think it would have been better if we do not do only theory in all the first three years. They are not bad but at least we should start clinical years earlier because many things are packed in these last two years. – **Student focus group discussion, fourth year.**

TABLE 5.4: MEAN SCORES FOR PERCEPTION OF ATMOSPHERE

ITEM	MEAN SCORE
The atmosphere is relaxed during ward teaching	1.96
The course is well timetabled	1.91
Cheating is a problem at MakCHS	2.25
The atmosphere is relaxed during theatre practice	2.20
There are opportunities for me to develop interpersonal skills	2.95
I feel socially comfortable on the ward	2.58
The ward atmosphere allows for return demonstration	2.38
I find the ward experience disappointing	2.83
I'm able to concentrate on my skills well	2.48
The enjoyment outweighs the stress of the work on the ward	1.64
The atmosphere motivates me as a student	2.34
I feel able to ask the questions I want	2.85

There are crucial lessons to learn from these findings. An atmosphere in the workplace that is supportive of teaching and learning should have affordances or invitational qualities that encourage students to participate. While affordances can facilitate learning, sometimes it is up to the student to take personal initiative or exercise learner agency in order for learning to take place (Chen *et al.*, 2016:203). The student should demonstrate the desire to learn, which is one of the principles of adult learning, through which adults are given opportunities to shape their learning. The importance of the desire to learn by students is illustrated in the following quotation:

There are others who finish yes, they have hustled a bit with signatures here and there, but they have learnt a lot because they are always on the ward, so it's practically personal drive to tell yourself OK, much as I can get the signature, I still have to know what it is like. I still have to know how to deliver a mother but I could actually go just stand, mother

pushes and then after that I run to the teacher, "I was there", and I get the signature, you see, so it's just self-drive to get there. – Student focus group discussion, fourth year.

The atmosphere within which learning takes place is composed of the learning environment, the teacher, the patient, as well as the student and has been variously referred to as the learning triad or learning ecosystem. Viewing the learning atmosphere as an ecosystem helps teachers and students to contextualise whatever is learnt, especially in clinical medicine, as being fit for purpose. The content, function, setting and the person utilising this content cannot be discussed in isolation, since the complex interaction between these entities constitute the learning atmosphere, and their interaction is important for cognitive, behavioural and psychomotor applications in the achievement of competence (Barab & Roth 2006:3).

5.3.6   Social self-perception

The social self-perception sub-scale produced results that deviated from that described thus far (cf. Figure 5.6). An almost equal number of students stated that the learning environment was "not too bad" (43.5%) as those who stated that it was "not a nice place" (46.5%). At the extremes, there was a larger percentage of students who judged the learning environment to be "miserable socially" (8.8%) than those who judged the learning environment to be "very good socially" (1.2%). This finding is similar to results of a study done in the United States, where the social self-perception sub-scale produced results that were quite different from that of the other sub-scales (Veerapen & McAleer 2010:online).
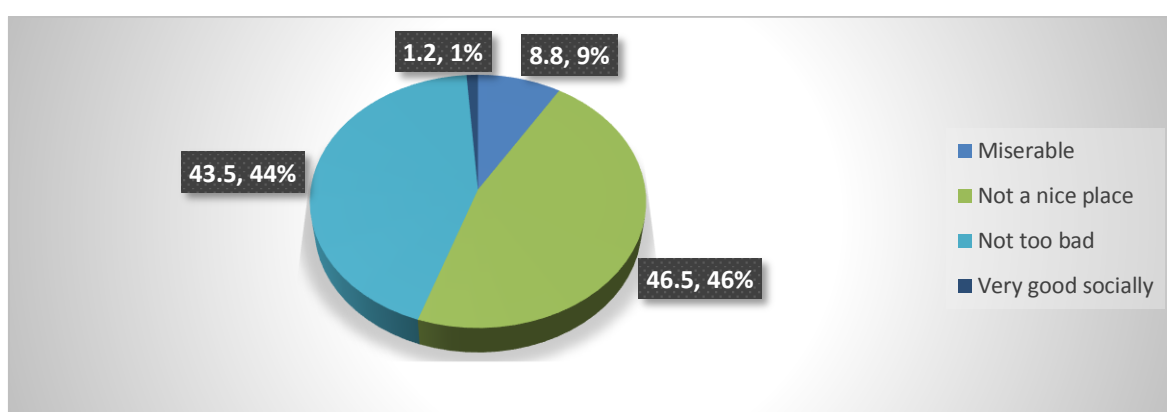
FIGURE 5.6: SOCIAL SELF-PERCEPTION

All the items in this sub-scale had a mean score below 3.0, which is worrying because it reflects a learning environment with major issues (cf. Table 5.5). This sub-scale had items

with the lowest mean scores of all the statements in the entire tool, among which are, "The meals at Galloway hostel are pleasant", with a mean score of 0.38, and, "The places of convenience on the wards are good", with a mean score of 1. These are real problem areas that need to be examined more closely. The findings in this sub-scale are similar to results obtained by a study at a university in South Africa (Schoeman *et al*. 2014:143).

The social climate in a teaching institution has important implications for the nature of the learning experience (Pai *et al*. 2014:103). Having good friends and not being lonely may impact on the student's socialisation within such a large community of students, and help the student to acquire coping strategies at the workplace as a teaching and learning environment with all its dynamics. A positive social climate also enhances learning, through the hidden curriculum. The hidden curriculum refers to the interactive relationships among students at different levels, or a set of influences that function within the learning environment structure and culture, which is passed on in an informal way (Al Kadri, Al-Moamary, Magzoub, Roberts & Van der Vleuten 2011:44; Hafferty 1998:403).

Clinical medicine training, like other industry, has lately embraced the concept of communities of practice. The medical school is a community of teachers, students and patients. In this environment, learning is more than just acquiring knowledge, as it involves complex relationships involving the novice being socialised into practice by another, who may be at a higher level or an expert in the field. This socialisation is helpful for the transition from a student identity to that of a professional clinician (Ranmuthugala *et al*. 2011:online). The process of socialisation will require that individuals are helped by others already in the system, to move from the periphery into full participation in the community's activities and culture, as the individual acquires the identity of a community member (Cruess, Cruess & Steinert 2017:online). This kind of socialisation requires that the novices make good friends and seldom feel lonely, so that they can easily integrate into the community.

Meals are an important part of the social environment and unpleasant meals can be a source of stress and also lead to poor academic performance. Studies have demonstrated that although brain maturation occurs early in life, certain functions continue to develop into adulthood, and nutrition can play a role in the development of abstract thinking and problem-solving skills (Correa-Burrows, Burrows, Blanco, Reyes & Gahagan 2016:185; Ghosh 2013:56).

TABLE 5.5: MEAN SCORES FOR SOCIAL SELF-PERCEPTION

ITEM	MEAN SCORE
There is a good support system for students on the ward: nurses, doctors and other staff	2.11
I am too tired to enjoy the ward work	2.29
I am rarely bored during this placement	2.21
I have good friends on the ward	2.93
The places of convenience on the ward are good	1.00
I seldom feel lonely in the medical school	2.27
The meals at Galloway hostel are pleasant	0.38

The students had issues with their relationship with the nurses and the demands of learning at the workplace where there was very little or no time to rest, as illustrated by the following quotes.

*Given the fact that some skills are leant from **nurses or midwives,** especially in obstetrics and gynaecology, at least they should be informed that when these students come, they should give them more attention. And the other thing, I don't know whether they teach them communication skills, but if you make a mistake, some nurses don't give a damn, they chase you and blast you there and then, you know, in front of the patients! It actually is really bad. – **Student focus group discussion, fourth year.***

*Actually, some students celebrate when the teacher doesn't show up, because it creates time for us. At times, we stay and we discuss what we are meant to do in the tutorial. No, we don't relax, there is no time for relaxing. You can't be free like during the day for very many hours, it is rare. We only relax when we are very exhausted, sometimes you reach a point where you cannot go on any more and you just relax a bit. - **Student focus group discussion, fourth year.***

5.4   CONCLUSION

Chapter 5 discussed the results of the engagement with the students using the DREEM tool and focus group discussions. Results from the DREEM indicated that, overall, the teaching and learning environment was perceived as having more positive than negative characteristics. Reasons for this perception, as explained in the focus group discussions, were presented. Most students focused on the availability of and access to patients for learning purposes. A small percentage of students, however, believed that the teaching and learning environment had plenty of problems such as the large number of students (overcrowding), inadequacy of workplace affordances, and shortage of equipment and supplies. The various subscales of the DREEM returned similar results. Salient findings were

in the subscale of perception of teachers, where about one fifth of the students stated that the teachers were in need of training; perception of atmosphere, where about one third of the students reported that there were many issues that need changing; and social self-perception, where an almost equal number of students judged the environment to be "not too bad" as those who judged it as "not a nice place".

In the next chapter, the results and discussions pertaining to the perception and experiences of administrators and teachers in relation to the workplace as a teaching and learning environment will be presented.

CHAPTER 6

RESULTS AND DISCUSSION; THE CLINICAL LEARNING ENVIRONMENT AS PERCEIVED BY THE ADMINISTRATORS AND TEACHERS AND THE STUDENTS

6.1 INTRODUCTION

In this chapter, the results from the key informant interviews with the administrators and teachers of undergraduate medical students will be presented and discussed. The aim of the key informant interviews was to determine the perceptions and experiences of the administrators and teachers about the workplace as a teaching and learning environment. *Supplementary information is introduced from the focus group discussions with the students to serve the purpose of triangulating of the results, in an attempt to achieve a superior explanation of the findings* (Fiorini, Griffiths & Houdmont 2016:37).

It is well documented that the learning environment is a significant contributor to learning and achievement of competence in preparation for clinical practice (Dijkstra, Pols, Remmelts, Rietzschel, Cohen-Schotanus & Brand 2015:300; Kibwana *et al*. 2017:5; Sajjad & Mahboob 2015:1272). Teachers need to ensure that the teaching and learning environment provides engagement opportunities that enable students to participate in activities according to the highest level allowed by their experiences and abilities (Chen *et al*. 2016:203). For effective learning to take place, it is, therefore, imperative that the workplace offers more opportunities than challenges. Identifying the opportunities and challenges in the teaching and learning environment provides useful feedback for purposes of planning faculty development programmes that focus on learner needs and contemporary changes in medical education, and to address resistance usually associated with new innovations in teaching and learning (Shehnaz, Arifulla, Sreedharan & Gomathi 2017:68).

During their clinical placements, undergraduates are taught by lecturers from MakCHS and consultants from MNRTH (cf. point 3.5.2.2). The teachers work together during patient care, teaching and student assessment, regardless of where the teachers are employed. All clinical disciplines are taught from one sprawling setting known as Mulago Hospital Complex, save for psychiatry, which is taught from a specialised hospital, Butabika Hospital,

which is about 9 km from Mulago Hospital Complex (cf. point 3.4). Students interact with patients freely without hindrance at all the workplaces.

As is customary for chapters that present and discuss results, cross-referencing is done to sections that refer to literature quoted in previous chapters, while some new references to literature not previously quoted are introduced.

6.2 SUMMARY OF PROCEDURE

The perceptions and experiences of administrators and teachers regarding the teaching and learning environment at MNRTH were assessed using key informant interviews. The key informants were the top administrators at MakCHS and MNRTH, all heads of clinical departments, and a sample of teachers. The quota system was used to select teachers purposively from all the departments where undergraduate medical students rotate during their clinical placements. A total of eight administrators from MakCHS and MNRTH were included in the study. Altogether, there were 187 teachers, and 10 heads of departments. The original plan was to recruit 30 teachers, inclusive of heads of departments, but saturation was reached at 24, when interviews elicited no additional, new information, and recruitment for further interviews was discontinued. By this time, all departments had been represented (cf. point 3.5.2.2 & 3.5.2.3). This number was consistent with the suggestion that between 5 and 50 provides an adequate sample size in qualitative research (Guest *et al*. 2006:59).

The interviews were conducted using a key informant guide (cf. Appendix C), of which a preliminary version was developed from literature, and improved from the results of the curriculum document review and the focus group discussions with students.

The key informant guide was pre-tested with one of the administrators of the hospital for clarity and to estimate the duration of the interview. Most of the questions were found to be clear, and the interview lasted about 45 minutes.

Using the framework method, thematic data analysis was done with the help of ATLAS.ti, a computer-assisted qualitative data analysis software program (Gale *et al*. 2013:117; Woods *et al*. 2015:597). Audio recordings of the key informant interviews were transcribed into text, which was entered into ATLAS.ti after the researcher had listened to and read

through the transcripts several times as a way of becoming immersed in the data. Using a combination of deductive and inductive approaches, quotes were identified, which were arranged into codes (descriptors of important quotes) covering key issues. The codes were then arranged into "families" that constituted the themes – impressions that were used to describe and shed light on the attributes of the workplace as a teaching and learning environment. The themes were developed both deductively and inductively on the basis of the key informant interview guide as well discoveries of unexpected perceptions and experiences of the key informants regarding the workplace as a teaching and learning environment.

6.3   RESULTS AND DISCUSSION

The key informants provided mixed perceptions about the teaching and learning environment. While some experienced the learning environment as enabling, others believed that there were many challenges at the workplace that needed to be addressed in order for teaching and learning to take place effectively.

The results are discussed according to **five themes** that emerged from the key informant interviews, as indicated in Table 6.1.

TABLE 6.1: THEMES AND SUBTHEMES FROM THE KEY INFORMANT INTERVIEWS

THEME	SUBTHEMES
Resources available to the students	• Patient numbers and case mix • Access to patients • Library and information communication and technology
Quality of facilities	• Infrastructure, equipment and supplies • Social services (common room, meals, restrooms) • Patient privacy, convenience and confidentiality
The teachers	• Availability • Teacher skills, expertise • Role modelling
The learning experience	• Orientation of the students • Practice opportunities • Career choices • Use of spare moments
Organisational structure	• Environment culture and hidden curriculum • Communications and administrative/interpersonal relationships • Planning

6.3.1 Resources available to students

An important expectation in a clinical learning environment that is ideal for the acquisition of knowledge, skills and attitudes is that students will be able to see the most common diseases and conditions. It is therefore important that a workplace that serves as a teaching and learning environment has **adequate patient numbers and a suitable case mix;** if not, competence achievement will be suboptimal.

6.3.1.1 *Patient numbers and case mix*

The key informants perceived the workplace at MNRTH to be well-endowed with adequate patient numbers and a suitable case mix, which were perceived as a strong point. According to the curriculum, workplace learning is situated towards the tail end of training, so that students can gain exposure to situations similar to those they will encounter when they qualify. This exposure is important for their transition from a student identity, with peripheral participation in patient care, to that of clinicians who are ready for full participation and responsibility for their own patients (Gonzalo, Thompson, Haidet, Mann, & Wolpaw 2017:1687; Kohl-Hackert *et al*. 2014:12). The perception of adequate patient numbers and a suitable case mix as a strength at the workplace is illustrated by the following quotes.

> *It is a national referral hospital and this provides a wide range of patients, cases nearly in all disciplines referred from all the regions of the country so, clinically, that is very good, because the students end up getting exposed to nearly all the cases.* **Administrator, MakCHS.**

> *Another strength is that we get almost all the cases, being the only public hospital which does not charge for service, so we get all types of patients, so a student will leave a ward when he has seen almost everything in neurosurgery right from the tumours, the congenital abnormalities and the trauma. So, there is a variety of cases to see and, as you know, seeing once is better than hearing a thousand times.* **Teacher, Neurosurgery.**

> *There are very many patients. If the students are really interested in learning, this is the place, and they present with various conditions. So, an active and interested student will not fail to learn, will not fail to find patients to clerk, to examine, to present. And then the other opportunity they have is that, at least on my ward, we have a physician doing ward round four days a week, we reserve one day to the residents, the senior house officers, so*

there is a lot of opportunity to learn. Every day, if you come to a round, you will find a physician and they will teach you something. **Teacher, Internal Medicine.**

However, although the availability of patients is a strong point of the workplace, a challenge occurs when patients are not matched with other facilities, such as equipment and supplies. In addition, there may be so many students that it is rather difficult for a teacher to manage all the students with limited resources and the available patients. This is illustrated by the following quote.

The patient numbers and case-mix is quite okay and wide, but that comes with a cost. When you have so many patients, it tends to outstretch the resources in terms of supplies and the human resource that is available. So, that other part is not as good as we would want it in terms of the students seeing the exact drugs being given and the patients being managed very well, the interventions being done in time, so that is an area that really needs to be improved. **Teacher, Obstetrics and Gynaecology.**

Because of the numbers, if the student number was matched to the facilities, we then would not have issues, but because of big numbers, inevitably you have compromise to the care given to the patients. **Administrator, MNRTH.**

6.3.1.2 *Access to patients*

Another strength of the workplace as a teaching and learning environment was that the students had unrestricted access to patients, and the patients were very receptive to the students. When the students have unrestricted access to patients, they can freely observe their teachers during patient care in the workplace and are able to learn beyond what is formally taught; they listen to teachers verbalising their thoughts, a process known as "thinking aloud", and also watch them during the patient encounters. This is illustrated by the following quotes.

The patients do not mind about the students, they actually like the students because they are very close to them and they think that they can be their means to the ultimate ((the best care)), so they do not have a problem. **Administrator, MNRTH.**

Our patients are very forgiving and some think that if they are attended to by a large number of "doctors", ((participant indicated the quotation marks with two folded finger of each hand over his head)) that their problem will be discussed and several opinions leading to the best management modality will be generated. **Teacher, General Surgery.**

Unrestricted access to patients enables students to observe their teachers as they work, and to participate in workplace activities, such as patient care, with increasing responsibility (Chen & Teherani 2015:1186). Access to patients, as well as adequate patient numbers and suitable case mix, give students more opportunities to observe a variety of pathologies, and to learn from the experience (Duvivier, Stalmeijer, Van Dalen, Van der Vleuten & Scherpbier 2014:61).

The students corroborated this perception and expressed similar sentiments, namely, that availability of patients with a variety of conditions created opportunities for learning, and that the patients were willing participants in the learning process, as illustrated by the following quotes.

> *For Mulago, as a teaching hospital, the patients are there with all sorts of diseases, so we get the exposure, which is a bonus and they want you to attend to them so you can never say you don't have a patient. They are always there, they are always wanting someone to listen to them.* **Student focus group discussion, fifth year.**

> *What I think about the working environment here, am very positive about it. There is opportunity to learn because in Mulago, which is a national referral hospital, we get all kinds of patients and conditions, so there is a very big opportunity to learn and that's the good thing.* **Student focus group discussion, fourth year.**

6.3.1.3 *Library and information communication and technology*

Successful workplace learning requires additional resources, such as access to **libraries** and **ICT.** It is important for teachers and students to be able to search recent literature as part of evidence-based care for patients. Often, during workplace learning, the teachers refer students to literature, so that students can develop a deeper understanding of the concepts behind the decisions made by the teachers in caring for patients. The key informants were of the opinion that it was important to have these facilities at the workplace; however, the facilities were lacking or inadequate, as evidenced by the following quotes.

> *We definitely need internet, you see, and you have had all this exposure ((referring to the researcher)), students and staff should be able to access the internet wherever they are, because, even in theatre, you may want to refer or make some consultations, they can even take a picture and share with someone.* **Teacher, Obstetrics and Gynaecology.**

It would be very important if the students came to theatre and there is some wireless internet, such that they can be able to search for things to find out the correct thing. It would be very interesting but there is nothing like that even access to a computer is also not there. **Teacher, Anaesthesia.**

Using the internet for learning purposes improves the student experience and adds value to the quality of education (Chun, 2014:70). The quality of care provided to patients by clinicians and students is also improved, as a result of increased confidence by the care providers, improved drug dosage calculations, information sharing, and education while on the move (Koehler, Vujovic & McMenamin, 2013:3; Rouleau, Gagnon & Côté, 2015:online). The very busy schedules of both clinicians and students make it difficult for them to consult library resources when they leave the workplace. The ability to consult while learning and offering health care at the workplace could provide an excellent opportunity to keep up to date with the ever-increasing evidence base (Majid *et al.*, 2011:229). The workplace as a teaching and learning environment should, therefore, have facilities such as resource centres containing reference books on the various wards, and easy access to ICT, so that students can search and access library resources quickly and on the go.

6.3.2   Quality of facilities

The quality of facilities in the learning environment is deemed important for imparting knowledge and skills to students. Facilities generally referred to in this study are infrastructure, equipment and supplies, social services (common room, restrooms), patient privacy and confidentiality.

6.3.2.1   *Infrastructure, equipment and supplies*

One of the areas where the key informants referred to challenges that had to be addressed was infrastructure, equipment and supplies. The key informants were of the opinion that inadequacies in these area affected learning, as students were inadequately equipped as a result of missed opportunities for practice; hence teaching and learning were suboptimal. This perception is illustrated by the following quotes.

The facilities are really lacking, like I have just been now teaching PGs [postgraduates], you cannot teach undergraduate students what they should do with patients when the facilities

are not there. So, by talking out of the head, I keep telling people if you end up in New York, you should know A, B, C, D, but they have never seen it, the lab tests have not been done, they just hear of it or read of it in textbooks, so I think that is the big gap. **Teacher, Obstetrics and Gynaecology.**

Of course, it affects learning in that it makes learning less enjoyable, yet learning should be enjoyable. Not only does it make it less enjoyable, but also difficult, and at the end of the day the learning may be suboptimal and it may be below the required standard that we expect. **Administrator, MakCHS.**

Infrastructure, equipment and supplies are very important for workplace learning, as these resources form part of the ecology of education (cf. point 2.3). In a study to evaluate trainer perception about the learning environment in Ethiopia, lack of infrastructure and equipment was found to be one of the emergent themes (Kibwana *et al*. 2017:5). This shortage of equipment and supplies is not limited to Ethiopia, as it has been reported in other studies too (Ranson, Chopra, Atkins, Dal Poz & Bennett 2010:435). Shortages of equipment and supplies are usually compounded by an ever-increasing number of students. Because of the pressure to increase the number of health workers, policymakers exert pressure on training institutions to increase their intakes, in total disregard of the capacity of the teaching and learning environment. This tendency is illustrated by the following quote.

One of the issues is the adequacy of these facilities visa viz the student numbers, because when the college is admitting, they do not admit according to our capacity of the hospital, they admit according to national demand. So the admission rate is not matched with the growth rate of our facilities. **Administrator, MNRTH.**

The World Health Organization (WHO) recommends that education institutions are accredited by authoritative bodies. One of the areas suggested for inclusion in accreditation criteria is the availability of adequate infrastructure and learning resources in the learning environment (Fullerton, Johnson, Thompson & Vivio 2011:308). This requirement is, however, not always met or enforced, leading to training schools and hospitals continuing to provide suboptimal medical education because of inadequate infrastructure (Tsinuel *et al*. 2016:277). This lack may be the reason for the reported mismatch between graduate competences and the health care needs of individuals and the communities graduates serve after qualification (Frenk *et al*. 2010:1923). Indeed, one of the key informants made the following recommendation for improving teaching and learning at the workplace:

One of the recommendations is there should be accreditation of the teaching and learning environment, that any unit used for learning should go through an accreditation process and there in the country we should or we must have an accreditation system for teaching environments. **Administrator, MakCHS.**

The students were equally concerned about the differences between what is taught and what is observed at the workplace, as illustrated by the following quote:

I think the teaching environment is a bit far from ideal because you may read something in the books and then you come and find something totally different being practiced and it's always hard. You may forget what you read and erase the right thing from your head and just remember practices that you see every day, like, the environment is a bit confusing. **Student focus group discussion, fifth year.**

The actions of faculty, such as advice, feedback and behaviour, influence competence development in the students. Situations of inadequacy force teachers to improvise, and this limits the kind of feedback that can be given to students, as illustrated by the following quote.

There is a challenge as well, because many times we have improvised things. So, even when we want to give feedback, from the start, the student has seen things that haven't been done well. They have not gone through things the standard way, they are using what is available and not going through the standard. Sometimes it is a big challenge to start, ah, not criticising, but now critiquing and telling them that this and this was supposed to have been done like this but then you did not do it like this. **Teacher, Anaesthesia and Critical Care.**

Resource challenges notwithstanding, some administrators were of the opinion that occasional shortages of equipment and supplies at the workplace and learning environment present a reality check for students. It makes them more resilient and creative in order to get the job done, instead of sitting back or giving up in the face of challenges. Overcoming these obstacles, therefore, produces doctors who are fit for purpose, because, in reality, the situation is similar to what they will come across when they qualify. Therefore, the training environment shouldn't be too utopian, as illustrated by the following quote.

The positive side about it is that it makes students more resilient and creative, because they have trained in a difficult environment which makes them more thoughtful and

consider the resources much more carefully compared to those who train from an environment where resources are just flowing, they never stop to think about the need to conserve or to utilize resources carefully. **Administrator, MakCHS.**

6.3.2.2 *Social services (common room, meals, restrooms)*

The workplace should possess invitational qualities, such as conference rooms, a canteen and washrooms. These facilities encourage students to stay at the workplace beyond normal teaching hours to engage in peer discussions, and to search out opportunities to practise performing clinical tasks with progressive independence according to their level. The key informants perceived the workplace as having inadequate social services, as illustrated by the following quotes.

> *Yeah, social welfare, to some extent, there are gaps, just because the facilities we are using are very old. At this college most of the infrastructure was put up in the early 60s, including the hospital, and by then the numbers were quite few, and so in the current times, when the numbers have increased by a large proportion, definitely they will appear as if they are inadequate.* **Administrator MakCHS.**

> *Mulago should make sure that students have somewhere to sit on the wards, the rest rooms, to go to the bathroom, they should have a canteen.* **Teacher, Paediatrics and Childhealth.**

> *Now, once a student is off the ward, like, if I look at my ward, where do you stay, do you stand in the corridor? So, the facilities for them to hang around, for them to say, you know what, let us go and have a cup of tea, then after a cup of tea, we can come back and talk about this case. The environment is such that, for a cup of tea, for a reference book, for internet, probably you go to the medical school and once you are up there, the urge to come back is also not there, so you have got detached.* **Teacher, Internal Medicine.**

6.3.2.3 *Patient privacy, convenience and confidentiality*

In order for patients to be supportive during the learning encounter at the workplace, they should be assured of respect for their privacy and confidentiality. During preparation for the clinical session, the teacher should assure the patient of privacy and confidentiality. The teacher should also brief the students about the boundaries of the discussions to be conducted at the patients' bedsides. All stages of clinical teaching – preparation, bedside teaching and debriefing – require consideration of privacy and confidentiality for the patient.

The onus is on the teacher, while teaching at the workplace, to balance the needs of the student without compromising the privacy, confidentiality and dignity of the patient (Sajjad & Mahboob 2015:1272; Parniyan *et al*. 2016:36). However, this can only become a reality when the workplace is equipped with facilities such as patient screens to ensure privacy and ward side-rooms for further discussion of more sensitive and detailed information about the patient. A supportive workplace for teaching and learning should have protected spaces, which enables the teacher and the students to discuss in more detail the theoretical concepts underlying the patient's condition, as well as other issues related to a patient's illness, such as investigations required, differential diagnoses (handling the "what if" questions), treatment options and prognosis (Gat *et al*. 2016:onlline). Some of the issues for consideration during the debriefing, such as differential diagnosis and prognosis, may be too sensitive or delicate to be discussed while the patient is listening, as the patient may misunderstand the trend of discussion.

The workplace at MNRTH has a shortage of designated protected spaces for teaching and learning. In reality, teachers either discuss all the details by the patient's bedside, which compromises the patient's privacy and confidentiality, or avoid detailed discussion about the case, which, in turn, compromises the quality of the students' learning experience. The inadequacy of the facilities for ensuring patient privacy, coupled with the large number of patients and students, lead to situations of profound overcrowding, with little or no privacy and no protected space for deeper learning. This situation is illustrated by the following quotes.

> *One of the challenges we have is balancing issues of privacy and confidentiality when we are dealing with patients, and at the end of the day, definitely there are inconveniences to the patients. Because you find that, as you spend some time by the patient's bedside, teaching, the patients may miss out on certain aspects of their care.* **Teacher, General Surgery.**

> *The learning environment is less than ideal from several counts. One, if you look at the clinical facilities at the moment and in the last several years, they have not been ideal, for example, patient privacy. There is not enough separation or shielding between patients, so you cannot ensure patient privacy as one would like and the learning environment is too crowded, because there are many patients, so you do not see the ideal clinical setting in which you would want to see your patients managed clinically and also where you as a trainer would feel comfortable yourself, so there is shortage of space and therefore overcrowding.* **Administrator, MakCHS.**

6.3.3   The teachers

Teachers are an important resource in clinical medicine. Clinical teachers play the dual role of patient carers and teachers. The clinical teacher has to balance the needs of the student, the patient and the teacher him/herself. Clinical teachers do not only have to be subject content experts, but need to be well schooled in the art of clinical teaching. They must be available and should provide engagement opportunities for students during workplace learning.

6.3.3.1   *Availability*

Workplace learning should be such that every patient encounter is a learning opportunity; however, this is only possible when the teachers are available, competent and willing to teach. While teachers may be willing to teach at the workplace, for learning to be optimal, there is need for protected time and space, as well as students with the right experience, backgrounds and interest. Optimal learning requires that when students present themselves at the workplace for learning, teachers dedicated to teaching the students should be available. Additionally, there should be clear learning objectives and schedules so that learning is not always opportunistic (Hay *et al*. 2013:58). Because of competing demands for their time, such as patient care, research and economic survival, teachers sometimes find it difficult to create time to teach students (Pinnock, Shulruf, Hawken, Henning & Jones 2011:63). Nevertheless, the key informants believed that teaching opportunities existed, as there were enough supervisors at the workplace; one informant had the following to say:

> *We do have a lot of teachers and our teaching role is; I would say, boosted by the postgraduates, our postgraduates now have a log book and in their log book we check the way they teach the undergraduate students, but still, we do have a teaching timetable which is really strict and we empower the students to follow the timetables strictly. At the end we request that you countersign, the coordinators cross-check the tutorials conducted against the teachers who taught, so there are many checks at each point.* **Teacher, Pediatrics and Childhealth.**

However, some informants reported that it is junior clinicians who are available to supervise the students, and not always senior teachers, as illustrated by the quotes below:

The supervision can be better. Supervision can be better, but definitely they will not have especially the seniors, because they are not there all the time with the students whenever they are learning. But, of course, our system is such that there is a whole hierarchy, from the senior residents and students, so you could say there is supervision all the time, but not all the levels. The situation can definitely be improved. **Teacher, General Surgery.**

So, the teachers, who are the clinicians, there are two aspects to that and one is inadequate numbers – having teachers that are not enough. But the other is that the teachers may be enough, but they are not available all the time to give the necessary supervision to the students. So, you find that the students, maybe, much of the time, working with the junior clinicians, since the senior clinicians are not readily available. **Administrator, MakCHS.**

Many reasons were given to explain why teachers, particularly senior clinicians, were sometimes unavailable, among which was the following.

The other possible explanation as to why teachers are not available is the whole issue of low income, that teachers are paid poorly and the pay cannot enable them to look after their families. So, they have to look for additional sources of support and, so, instead of spending the required hours, time and commitment in the teaching environment, they have to go off and try make money elsewhere. But, also, one of the reasons could also be a sheer decline in the level of professionalism – that people are just not as committed as trying to do their best in the clinical environment, so declining standards of professionalism may contribute to that. **Administrator, MakCHS.**

We, the trainers, are not 80% around, at most we are 40 to 50% around, because of other commitments of the teachers, and many of the commitments is paperwork and computer work, which is a requirement of the University. But I think the University does not recognise that we do a lot of practical work. We have to spend time with the students, so one is always running up and down. It is interesting that, now, many teachers are not doing private practice, at least in internal medicine, but it does not mean that they are more available, because now there are more commitments, trying to do more training, research, applying for grants and so on. **Teacher, Internal Medicine.**

The teachers also face other challenges such as lack of teaching aids in the form of equipment for patient care, as illustrated by the following quotes.

The teachers are available most times, but a lot of times they get frustrated by the unavailability of the things that they need to work with. For surgery, it is a team effort.

Many times, a full team may not be there, or sometimes the things that they need to use, the sundries, are not there, and then you are not able to demonstrate certain things, but as much as in teaching the theory, the teachers are quite keen and very available, in spite of the challenges, though they are also few. **Teacher, General Surgery.**

The other challenge is the turnaround time for the diagnostics. We have side labs for simple things, but the turnaround time is quite long. The time it takes for us, from the time you request for a particular test to when you actually get the results, is quite long. It affects the teaching, especially because the students just have limited time on the ward, they cannot easily follow up these patients, because, ideally, we would like the student to clerk the patient. When the patient comes in, clerk, examine, request for investigation, and follow up this patient. But if the things are taking long and they lose touch with that patient, so they end up not following up the whole process to the end. **Teacher, Internal Medicine.**

6.3.3.2 *Teacher skills and expertise*

To achieve effective bedside teaching, it is important that teachers possess the necessary knowledge and skills in relation to the subject they teach. There appears to be no shortage of expertise and experience in the different disciplines at the workplace, and students have opportunities to interact with a variety of experts in the field as expressed in the quotes below.

Supervision is very good, even carrying out teaching is well covered, and the specialties also are very well covered to a large extent, and also the mentorship is very well covered, because we have a wide range of specialists, from the juniors to the seniors and the consultants, so that is very good because medicine is a practical subject, if I may use the word, and it requires a lot of apprenticeship. **Administrator, MakCHS.**

The human resource is fairly big, we have assistance, much as we are teachers from the Makerere University side, but we do have a lot of assistance and a good working relationship with our other colleagues from Mulago Hospital. So that builds a lot and that also goes to the nurses and other people who have had a lot of experience working here. So that is a strength of this institution, and the fact that this has been there for several years and we have been able to develop it over the years to make it better. **Teacher, General Surgery.**

However, though the expertise, experience and the necessary skills are available, some key informants expressed that the teaching was not being done as it should be. This sentiment

is not unusual, as it has been reported in literature that the use of bedside teaching for passing on important skills to medical students is declining. The decline has been attributed to various reasons, such as time constraints (large number of students and ever-increasing numbers of patients that have to be seen), shortened patient stay and patient unwillingness to participate in the learning encounter, inadequate training and preparation of the bedside teacher, lack of clear learning objectives and expectations, lack of learner agency (active learner participation), concerns about patient safety (and the attendant litigation) and comfort, unsupportive physical environments for bedside teaching, as well as student and teacher obsessions with technology (Gat *et al.* 2016:online). Because of the unpredictability of bedside teaching, which could involve unexpected interference from the patient, and students who ask questions that the teacher may not be prepared to answer immediately, teachers may prefer to teach in the classroom, where they have some degree of control and can guide the discussion to suit the teacher's expertise (Peters & ten Cate 2014:76). an observation about declining use of bedside teaching is captured in the following quote.

> *The bedside teaching, evening ward rounds, where people were taught in emergency wards, those ones are no longer taking place very well. They are not, because most of the teachers are now engaged in private practice, they are engaged in research and they do not have time for these students.* **Administrator, MNRTH.**

The challenge created by the large number of students that teachers have to contend with during teaching and learning at the workplace, is compounded by the large number of patients, which creates a state of profound overcrowding, as captured in the following quotes from the teachers.

> *Teaching sessions on the ward can be overwhelming, because of the large number of students that we have to interface with. You know about six junior clerks, about six senior clerks, then about six postgraduate students, visiting students from wherever, so you end up being one teacher who literally needs a microphone.* **Teacher, Paediatrics and Childhealth.**

> *The other issue is that, even in this small environment with these large number of patients, then you have a bunch of medical students, nursing students and all these postgraduate students, so you find that actually in this learning environment, you cannot carry out a good clinical teaching.* **Teacher, Orthopaedic Surgery.**

This sentiment was also expressed by the students, as indicated by the results of the focus group discussions, of which the following is an example.

You find that there are so many of us; SHOs [senior house officers], fifth years, and you fourth years, you are the underdog, you are the lowest in the food chain and you sometimes have to stand somewhere far from the patient's bed because the whole place is packed, they are doing something and you can't see and you learn nothing. **Student focus group discussion, fourth year.**

Some teachers referred to the attitudes of some of the students as another hindrance to learning; students were described as being passive, and, in many instances, they lacked enthusiasm for learning. For clinical teaching to be successful, there is need for learner agency, that is, the intentionality of the learner to learn. This learner agency motivates teachers, as they are stimulated by enthusiastic students. The lack of interest by students observed by key informants is illustrated by the following quotes.

In our time, we used to… after the official clerking hours, we would go to the wards and clerk among ourselves, present to each other, critique each other and we would leave the ward like at 8 pm, move across Katanga [a stretch between the medical school and the halls of residence]. But of recent, we have very bright students coming to the school of medicine but they are not that interested in learning. Nobody is interested in learning, except the teacher. The students are not interested, it is as if it is prestigious to some students to do medicine, but they do not have the calling. **Teacher, General Surgery.**

I think that students are not as interested in medicine as they used to be, you know, people would be so hungry to learn everything, follow the intern around, follow every bit of ward round, go to acute, clerk patients, but now there must be something that is making them, either as individuals not as interested or we as teams on the ward. We are not enticing them and maybe because there is no repercussion. **Teacher, Paediatrics and Childhealth**

The students complete the learning triad, which is comprised of the teacher, patient and **learner** (Garout *et al.* 2016:261). These three stakeholders have complementary roles in workplace learning: teachers bring their skills, experience and knowledge; patients present with signs and symptoms and share insights into their problems; and students should present themselves as motivated and eager to learn. Students should demonstrate their intention to learn by showing enthusiasm and actively seeking out and participating in the learning activities at the workplace, as far as their knowledge and experience allows, and interacting with teachers as much as possible. This is referred to as learner agency (Chen *et al.* 2016:203; Goldie, Dowie, Goldie, Cotton & Morrison 2015:online).

The responsibility for stimulating students' interest in workplace learning is not solely that of the students – teachers also need to be conversant with theories of workplace learning, such as achievement goal theory, and teachers should assist students to become interested in learning when they come to the workplace. Achievement goal theory describes three learner goal orientations, namely, the mastery learner approach (learn to improve), performance learner approach (demonstrate competence), and performance-avoid approach (avoid demonstrating incompetence). The best learner orientation is the mastery approach, where the learner's goal is to succeed, and success is defined according to the task at hand. In contrast to the performance learner approach where the learner's goal is to demonstrate competence by outperforming others. In the performance-avoid approach, the learner focuses on avoiding failure or appearing incompetent (Chen *et al.* 2016:203). In a group of mediocre students, the students with the latter two orientations will not be stimulated enough, because lack of competition leads to less robust learning. Students with a performance-avoid approach to learning prefer to stay in their comfort zone; even when they know an answer, they prefer to think it through over and over, all the while not volunteering to participate in the learning activity, until when they feel that the answer is perfect. For successful workplace learning, the teacher is responsible for steering students away from the performance-avoid approach type, to the mastery approach. This information about learner achievement theory is not necessarily part of the knowledge clinicians acquire at medical school, instead, it requires specific training in bedside teaching; hence, the need for focused faculty development opportunities.

During key informant interviews, the teachers stated that students were not applying themselves well enough to benefit from the available learning opportunities. This failure created concerns among the teachers, who had the following to say:

> *I do not know whether, today, things are changing. The students do not seem to have an initiative to learn. They are waiting to be told what they should learn.* **Teacher, Ophthalmology.**

> *The different teachers are available because we have different people within the department with different skills and different specialties and so, the onus should be on the students to make sure they appear and see what these people are doing so that they are able to learn from them.* **Teacher, Obstetrics and Gynaecology.**

The short time that students spend at clinical placements also affects the exposure they get during bedside teaching. The short duration of placement does not enable students to get enough grounding so as to develop an interest at particular placements. Sometimes, the timetable is such that students are expected to be in different places at the same time, or to spend little time at particular clinical placements, and, therefore, they are not getting enough exposure. Just when students are beginning to appreciate how things are done at a particular clinical placement, they have to move on to the next. While the teachers have the desire to teach, they believe that the environment and organisation arrangements are not conducive to learning, and this affects their capacity to teach adequately, as illustrated by the following quotes.

> *Definitely the five weeks, leave alone the turn-around time for these patients, but the five weeks is just not enough for them to learn. It is not enough, because during the first week, we do orientation, history taking, they are just learning to take history, then we start going into the different systems, examination of different systems, but this is very limited. It does not give them enough time to practise clerking and examining patients, investigating and following up patients until discharge or until recovery, so in my opinion, five weeks is very limited time.* **Teacher, Internal Medicine.**

> *It is really hard to know where they are when they are not with us, because, even the days when they are supposed to be with us in the clinic, they'll show up at 11 am. And when you ask them, they tell you, I was in the library, another one will tell you, I was in Anaesthesia, another one was in ENT, so we actually do not know whether those two solid weeks are meant to be with us entirely, because they will tell you in the afternoon, I have a lecture in Obgyn [Obstetrics and Gynaecology]. So, it is, like, only half a day is what we have with them, we actually do not know officially whether those two weeks they are supposed to be with us from 8 to 5 pm.* **Teacher, Ophthalmology.**

6.3.3.3 *Role modelling*

The required attitudes, as part of competence achievement by medical students may not acquired through formal teaching. They are modelled by the teacher and students copy the behaviour of teachers while students observe teachers during the teachers' interactions with patients. Teachers, therefore, need to be exemplary. While the teachers make every effort to be good role models, they sometimes find themselves in situations where they are forced to compromise on their behaviour when faced with circumstances that require them to perform with limited resources. This situation was illustrated by the following quotes:

What we teach them, they see it being practiced and it gives them time to have more practise sessions and perfect the skills that they have. The only challenge comes if the hospital does not have the facilities. If the facilities are lacking and you do not end up practicing what you teach, that is when there is a negative impact on it. However, we consider it a very good experience to offer a service as we are also teaching. **Teacher, Internal Medicine.**

The students see us as role models, so if the professors go and start doing work in the hospital, the students will even learn better, because they take it that this is the professor doing this other than a consultant, or a senior house officer, or even an intern who is guiding them on that. So, the professors should not sit back, they need to go to the wards and show the students what to do. **Administrator, MakCHS***.*

The role of the clinical learning environment in learning and professional development cannot be overstated. Changing health care demands, therefore, imply that the clinical practice environment should be regularly evaluated for purposes of continuous renewal and improvement (Gonzalo *et al*. 2017:1687). As the students' progress in their development, it becomes imperative that they have opportunities to observe their teachers while the teachers as clinicians care for patients, and that students practise taking care of the patients themselves, with increasing responsibility (Duvivier *et al*. 2014:61). The more opportunities to observe and practise students have, the more they develop their competence. During these repeated encounters, students model the behaviour of their teachers while the teachers interact with patients, and students gradually learn professionalism and the right attitudes. "Active structured participation by students in day to day clinical activities is the key to learning in context" (Sajjad & Mahboob 2015:1272).

6.3.4   The learning experience

The quality of learning experienced by the students at the workplace has important implications for the way they become when they graduate. The learning experience can be formed by various factors within the learning environment, and may include the people and the environment itself, with its systems and the culture at the workplace.

6.3.4.1   *Orientation of students*

The experience encountered by the students in the workplace when they report for their first clinical placement can have profound effects on their futures as students. The way they

are received by the specialists, nurses, midwives and other health workers, and introduced or oriented to the workplace may create positive expectations; alternatively it could be a traumatic experience of which the memory lasts a long time and which has profound consequences. The introduction is a sort of initiation into a new ecosystem that will form a large component of students' lives. Most of the key informants believed that learner orientation was done well, as illustrated by the following quotes.

> *We do two things: there is a meeting with the head of department, to kind of outline the expectations from them, where the different teaching points are, they ask questions and they get the answers. But then, when they are deployed to the different units, they get introductory letters.* **Teacher, Surgery.**

> *On the very first day, the standard procedure is to brief them on how their clerkship will run. They are briefed by the head of department and the course coordinators and this briefing includes giving them generally an overview of the department of Obs and Gyn [Obstetrics and Gynaecology], the different units which constitute it, the different cadres of staff, which areas as undergraduates they are expected to rotate, what they are expected to do in terms of teaching methods, where and when. They are also taken through how to clerk obstetric patients and gyn [gynaecology] patients, because usually there are differences. The orientation climaxes by handing them to the midwife superintendent, to take them on a tour around.* **Teacher, Obstetrics and Gynaecology.**

When the students report at the workplace, it is important that the various stakeholders involved in their learning, as duty bearers, realise that most of the students are young, impressionable students who need to be handled with care. It, therefore, becomes imperative that students feel welcome in this new ecosystem. Key informants pointed out areas that could make the students feel welcome or unwelcome, and these areas are illustrated by the following quotes.

> *I think they are welcome. I think it helps that this is a teaching institution, so the mentality throughout is that – the teaching mentality – so different people, from the nurses to the doctors, are expecting the students and they have a programme for them and they are willing to help them and to involve them, so I think, generally, it is a welcoming environment for them, unless the student has a problem.* **Teacher, Cardiothoracic Surgery.**

My role, first of all, is to try and offer a welcoming environment as much as possible, because, already we have this tensed-up situation, so I really don't want to worsen it at any moment. So, we have to make it calm for them to feel welcome right from the start, and that they are welcome to the department, through giving them all the expectations how the things will be running, to offer enough information for them to be able to manoeuvre their way around. **Teacher, Anaesthesia and Critical Care.**

6.3.4.2 *Practise opportunities*

The workplace is important for learning medicine, because medicine as a practical discipline is learnt best by practising (Dornan 2012:15). As students progress in their competence development, experiential learning should offer opportunities for participating in patient care by applying the knowledge, skills and attitudes that they have acquired over time, to the real patient/clinical situation. Key informants reported that the workplace afforded such opportunities for practise to the students, albeit with some limitations, as illustrated by the following quotes.

The students are able to practise and the teachers are available to see that the students are doing what they are supposed to do, and giving them the feedback. **Teacher, Paediatrics and Childhealth.**

What we teach them, they see it being practiced and it gives them time to have more practise sessions and perfect the skills that they have. The only challenge comes if the hospital does not have the facilities, if the facilities are lacking and you do not end up practicing what you teach. **Teacher, Internal Medicine.**

The students usually start by performing simple tasks, such as drawing blood, writing notes and taking observations under supervision – tasks referred to as peripheral. They eventually move on to more complex tasks as they develop competence. During their peripheral participation, students contribute to the health workforce – they do not appear at the workplace as detached bystanders, just waiting to absorb knowledge, instead, they are willing participants in the provision of health care to the patients (Cruess *et al.* 2017:online). During the application of the concept of learning medicine as a community of practice, students should be regarded as contributors to the care of patients, and should be afforded opportunities to work with patients as they learn, as illustrated by the following quote.

What all the service providers need to realise is that students are part of the health care workforce; they may not be very knowledgeable or very skilled, but at least as they participate in the activities. They not only learn, but are also part of the hands on the ground, part of the health care provider force. **Teacher, Obstetrics and Gynaecology.**

This approach provides for gradual integration of students, as they immerse themselves into the medical ecosystem and its culture, language, and values in an authentic fashion.

6.3.4.3 *Career choices*

An ideal clinical learning environment should inspire students, not only to complete their training, but also to choose a future career in a discipline of interest. Most students are inspired by teachers, as they see them as role models. The environment in which students observe their teachers practicing; the enjoyment the teachers seem to derive from practicing, or the difficulty in which they practice, can form the basis for choices made by the young, impressionable students. Some of the students are driven by prestige and material gain when they see their teachers as being successful and financially secure, and they are motivated to make particular career choices. While some key informants encourage students to choose particular disciplines, the general feeling was that the workplace at MNRTH as a teaching and learning environment may not be very encouraging for students to choose a career in clinical medicine, mainly because of the limited resources, as illustrated by the following quotes:

Their choice of career may actually be negatively affected, in a sense that, as I said, they do not enjoy what they are doing as well as they would have. They may say, clinical services, clinical care is a very difficult area, it is a depressing area. You see patients who are suffering and you cannot do much for them because you do not have the resources. So, they may say, no, this is too stressful a situation, I do not want to get into clinical care, I would rather go to public health or laboratory medicine. **Administrator, MakCHS.**

The learning environment they are seeing now, I do not think it will encourage them to choose obstetrics and gynaecology as a career. They see overcrowding, they see perinatal mortality in quite a number of cases, which is avoidable due to institutional delays, they see maternal mortality, which in a number of cases is avoidable with better supplies and personnel. So, they do not see a lot of joy that should be, and that I talk about obstetrics. If I talk about gynaecology, again, they see a lot of delays and pain and discomfort that

could have been handled better in a better clinical environment. **Teacher, Obstetrics and Gynaecology.**

In a study done in Ethiopia, students preferred not to specialise in particular disciplines because of observed shortages of equipment and supplies at the workplace (Assefa, Haile, Mekonnen & Derbew, 2017:online). Fewer graduates will choose a specialty as a career if the specialty does not appear attractive at the time of their clinical placement during training, in terms of flexible working hours, availability of equipment and supplies and practice satisfaction. The undergraduate experience and exposure at the learning environment during clinical placement, therefore, plays an important role in students' career choices (Guraya & Almaramhy 2017:1; Kizito *et al*. 2015:1; Pianosi, Bethune & Hurley 2016:E147; Zia, Abbas, Sulaiman & Sheikh 2017:1086).

6.3.4.4 *Use of spare moments*

Clinical placement does not involve only work and teaching. Occasionally, there may be moments on the ward when there is no specific assigned activity, or no teacher, or the teacher may be delayed or fails to report. Ideally, these are moments when the students can catch up on learning activities with minimal pressure. There is much that students can do during these spare moments on the ward; however, what they do is influenced by factors such as learner agency – the intentionality of the learner to learn, and workplace affordances - tasks and activities, relationships and interpersonal dynamics, and rules and norms of practice that support participation in the workplace. When teachers were asked if they had any idea how students spend their spare moments, they had this to say:

> *Most of them try to catch up with some of the assignments that they have been given, they have to do write-ups, they have to follow up patient care; thus, a good number of them try to follow up on their patient care. Some remain on the ward and what I have noticed, that depends on the individuals' interest, most of those who are just doing the rotation to complete the degree, will go and do other things, their personal things.* **Teacher, General Surgery**
>
> *Now, these students, when you are not on the ward, they do not stay around. Somehow, they want to be on the ward when you are possibly there. When they notice you are going away, then they also go away.* **Teacher, Internal Medicine**

Spare moments are very important for learning clinical skills and catching up on concepts that have been taught and need further clarification. When the workplace is facilitated well, students use these moments to search for literature -- they prefer quick methods of doing so, such as using smartphones (Twiss-Brooks, Andrade, Bass, Kern, Peterson & Werner 2017:12).

Students, however, were of the opinion that the timetable is so full that there are few spare moments. When free moments did appear, they used the time to catch up on pending activities, as illustrated by the following quotes.

No, we don't relax; there is no time for relaxing. We only relax when we are very exhausted. Sometimes you reach a point where you cannot go on any more, and you just relax a bit. You can't be free, like, during the day for very many hours it is rare. At time we stay and we discuss what we are meant to do in the tutorial. **Student focus group discussion, fourth year.**

How you utilise that free time depends on who is coming in next. If the person who is coming is, kind of, this person who asks questions and everything, trust me, that time no one is jazzing [wasting time], everyone is reading up the possible questions. But if it is someone who is relaxed you just jazz normal things as you wait around for the guy. If he doesn't come, then the whole day is more or less wasted. **Student focus group discussion, fifth year.**

6.3.5   Organisational structure

Organisational structure refers to the hierarchy of leadership and administrative relationships, the rules and regulations, and the communication and interpersonal relationships between different role players who interact within the learning ecology. It also encompasses other organisational dynamics, such as staff recruitment and turnover.

6.3.5.1   *Environment culture and hidden curriculum*

The hidden curriculum refers to commonly held beliefs within an education environment; customs, rituals and aspects of learning that are often taken for granted, which are transmitted, but not openly acknowledged (Hafler *et al.* 2011:440). The unrelenting shortage of supplies and equipment creates a necessity to improvise by the

clinicians/teachers. While improvisation may be part of innovation and creativeness, it sometimes promotes the hidden curriculum. The hidden curriculum becomes important in situations of inadequacy, where role players resort to alternative ways of doing things. Often, because of shortages, teachers improvise to such an extent that it becomes normal practice, so much so that students, *and sometimes teachers,* begin to think that this is the right way to do things. This is what students end up observing most of the time, and what is not right, becomes acceptable. There is a quote, sometimes attributed to Mother Theresa of Calcutta, which applies to this situation: *We the willing, led by the unknowing, are doing the impossible for the ungrateful. We have done so much for so long with so little, we are now qualified to do anything with nothing.* This state of affairs is pervasive in public service in Uganda, and medical training institutions are not spared, to the extent that, during patient care, practitioners such as nurses and clinicians say, "But that's how things are done here". Bedside teachers have to improvise to ensure that patients are taken care of. Often, ideal practice is sacrificed at the altar of the need to provide emergency patient care. This state of affairs is illustrated by the following quotes.

> *It is the space, it is the facilities, it is the clinical supplies, like drugs, that the students do not see. What they see is shortages of drugs and they see patients struggling.* **Administrator, MakCHS.**

> *The students learn from what they see, they have to know that, if you have a critically ill patient and you want this result, you must get it within 10 minutes. You may get it within 30 minutes, but then, if you are going to get it after 24 hours, then it is not healthy for the patient and even for the learning.* **Teacher, Obstetrics and Gynaecology.**

It is, therefore, important to determine how the hidden curriculum can be used to promote positive messages and reduce the effect of negative messages and their unintended outcomes (Hafler *et al*. 2011:440). The concept of the hidden curriculum positions the learning environment in the medical school as a cultural entity and a moral community, with its own definitions of good and bad; a sort of cultural ecosystem involving human interaction with the environment (Jenlink 2014:online).

The contemporary approach is to view workplace learning as a community of practice where medical educators focus on what students learn, instead of what they are taught at the workplace (Cruess *et al*. 2017:online). Because few aspects of learning in the hidden curriculum are explicitly taught and assessed, there is the risk of negative influences

creeping in and being passed on from one group to the next, as students are infused with the community's social expectations.

While the hidden curriculum is usually propagated by peers, teachers, who were part of this community as medical students prior to becoming faculty, may sometimes contribute to the hidden curriculum as it is transmitted to students and new entrants to the learning ecosystem (Hafler *et al*. 2011:440; Jayasuriya-Illesinghe, Nazeer, Athauda & Perera 2016:online; Yamani, Shakour & Yousefi 2016:online). The danger lies in failing to recognise negative role models that may be part of the hidden curriculum (Altirkawi 2014:31). Therefore, in the development of the medical students as they assume the clinician identity, it becomes imperative to acknowledge the importance of the hidden curriculum, which is sometimes driven by a shortage of equipment and supplies in the learning environment.

6.3.5.2 *Communication and administrative/interpersonal relationships*

Communication and interpersonal relationships play a significant role in the sustainability of any institution. The stakeholders need to be in constant communication, so that they can share their successes and challenges with each other in a quest for constant renewal and survival. The relationship between the different stakeholders and the environment is rarely stable and involve several dynamic processes. Communication moderates two opposite ends of a continuum, between entropy and emergence within an ecosystem. Emergence can be supportive of improvement and evolution of new ecologies, while entropy can lead to a complete breakdown of the ecosystem leading to disorder, especially when communication between stakeholders fails to lead to a compromise position (Weaver-Hightower 2008:153).

The learning environment is an entity comprising a number of stakeholders, who may present as opportunities or threats to the enterprise (Chapleo & Simms 2010:12). MNRTH and MakCHS, the two major stakeholders in the teaching and learning of undergraduates of MakCHS, are autonomous of each other in terms of organisational management (cf. point 3.5.2.2; cf. Figure 3.3). In such a setting, there usually exists an imbalance between the influence and interests of the different stakeholders. While MakCHS has considerable interest in ensuring that students have the best experience possible at the workplace during clinical placement, it may have little influence on the way MNRTH, the workplace, operates in terms, for example, of providing learning aids, such as equipment and supplies.

Sometimes, the stakeholders have diametrically opposing views of each other's responsibilities, as illustrated by the following quotes:

The Mulago staff have no problem, actually, because they are working, and if the students come around them, they will definitely teach, and when the students do not come, they will say, but why are the students not coming, so they get worried. But the Makerere staff, they say they want to teach and I do not know how they teach when they do not work and you know, when you want to be a professor, there is no other way of becoming a professor than doing a ward round and doing it comprehensively and come up with all your ideas. **Administrator, MNRTH.**

We have had people who come and define the teaching hospital in different ways, but I think, overall, it still remains a teaching hospital with responsibilities assigned to both the teaching staff of Makerere University and workers in Mulago Hospital. I think the main point of contention has been the roles of the different stakeholders in the teaching of our students in the Hospital, not the suitability of the Hospital. **Administrator, MakCHS.**

Makerere and Mulago seem to be at different ends of the river Nile, of the broad river. What I mean is that, Makerere, when they are planning, they are looking at teaching load, they are looking at research, and they are looking at publications. They do not look at clinical care, they do not realise that their lecturers may have to do night calls, which is not part of their mandate. Mulago, on the other hand, looks at anybody who goes for that qualification, should be able to work beyond the patients. So, sometimes, it looks like as if they are two masters pulling at different ends of the spectrum, so the two, their meeting point is very thin. **Teacher, Medicine.**

A medical school requires a teaching hospital and vice versa, and ideally they have complementary roles. The requirements for teaching at a medical school demand that teachers and clinicians provide cutting-edge patient care in terms of evidence-based practice; while the hospital provides the patients, in order to give students a quality learning experience. The medical school sometimes provides additional human resources, as the students are able to perform certain activities that can be classified as patient care by nature of their learning needs. A challenge, however, arises when the two institutions have parallel administrations with varied expectations of each other, to the extent that each may see the other as not doing enough to facilitate teaching and learning at the workplace. In any community, this state of affairs tends to encourage antagonism instead of synergy. Unless there is mutual trust and respect among stakeholders, the community cannot flourish and

achieve its potential, and members will not feel the desire to belong and drive the community's agenda (Cruess *et al*. 2017:online).

6.3.5.3 *Planning*

While the two institutions may share common goals as far as delivery of health care to the population is concerned, that is, teaching, research and patient care, their priorities may differ (Mubuuke *et al*. 2014:249). The primary goal of the hospital is patient care, while that of the university is teaching and research. The challenge usually has little to do with roles and responsibilities of teaching, and more with resource mobilisation, allocation and utilisation. These varied priorities lead to conflicts of interest, especially when the two institutions have different supervising line ministries, as is the case in most African countries (Tsinuel *et al*. 2016:277). In Uganda, Mulago Hospital falls under the Ministry of Health, and Makerere University falls under the Ministry of Education. This conflict of interest is illustrated by the following quotes.

> *In planning for the resources that go into teaching at the Hospital, the University has always been clear or, at least, MakCHS has always been clear that we cannot plan for resources used in a different facility. Mulago is a teaching hospital, it is known as a teaching hospital, so the hospital should plan for with the idea of the teaching component in mind.* **Administrator, MakCHS.**

> *The Hospital budgets for itself and does not budget for the students, so the undergraduates and other students are a priority of the University, and unfortunately, the University that is supposed to be budgeting and giving us those resources because that is for teaching, but the University does not appear to budget.* **Administrator, MNRTH.**

These divergent perceptions may suggest that a middle ground is unattainable, as confirmed by this analogy given by one of the administrators:

> *Therefore, it is like two neighbours existing. The two neighbours exist and when I come to your home, I eat what I find and when you come into my home, you eat what you find, but that does not mean that your home budgets for my coming and even plans for me. You should plan for yourself as I also plan for myself, but in case I visit you, we can share and so that is exactly the problem.* **Administrator, MNRTH***.*

There is clarity as to who provides for the patient care and patient services – it is the Ministry of Health. But for the teaching and learning component, that is not clear. To avoid confusion and make sure that things are very well streamlined, there should be only one entity that plans for the Hospital, and the starting point is to accept that this is a teaching hospital. **Administrator, MakCHS.**

Nevertheless, there were voices of moderation too, who were of the opinion that these two institutions should synergise rather than antagonise each other, because each has strengths that can be exploited for mutual benefit. These voices had the following to say:

The college can say, we can provide counsellors and the patients can be counselled because they really need the counselling. These patients, if you put a television for them, it is a healing environment, they will decide: do they want to listen to the music, do they want to watch a movie. You know it puts their mind off things. The college can say, we are going to provide the televisions, am just giving an example, okay, the human resource belongs to the Hospital and they are actually working. The College can say, we are going to provide the tea break. You get what I mean, but you know it helps that we are pooling resources. **Administrator, MNRTH.**

The equipment sometimes is not there, so I do not know whether Makerere should make a contribution to the equipment in the Hospital. I do not know really, because if you know the training of medical students requires that particular equipment and Mulago cannot put it there, is it possible for Makerere to provide that equipment, such that Makerere and Mulago work out a custody agreement, where Mulago is a custodian for the students to learn. **Administrator, MakCHS.**

6.4   CONCLUSION

This chapter presented the perceptions of administrators and teachers regarding the workplace as teaching and learning environment. To corroborate the views of the administrators and teachers, additional information was supplied from the students' focus group discussions.

The teaching and learning environment was perceived as both enabling and challenging in as far as implementation of the undergraduate curriculum was concerned. The key informants perceived the teaching and learning environment as enabling in terms of adequate patient numbers and case mix as well as unrestricted access to the patients. The

challenges reported, which included inadequacies in infrastructure, equipment and supplies, ICT facilities and social services, though real, were considered by some key informants as reality checks that encouraged students to be resilient and innovative in the face of shortages that were the reality in the clinical practice setting. Another challenge pointed out by the key informants was that the students were lacking learner agency, which can be a hindrance to competence development.

Chapter 7 reports on the results of the Delphi study, which presents recommendations for improving teaching and learning in the workplace as the major contribution of this study.

CHAPTER 7

RESULTS AND DISCUSSION: THE Delphi PROCESS; RECOMMENDATIONS FOR IMPROVING TEACHING AND LEARNING AT THE WORKPLACE

7.1   INTRODUCTION

In order to produce medical professionals who are responsive to the contemporary demands of medical practice, it is important that medical students are trained in a teaching and learning environment that is supportive of bedside teaching. It is through bedside teaching that medical students learn in situations similar to the ones in which they will practice when they qualify. Anecdotal reports and the literature (Garout *et al*. 2016:261; Peters & Ten Cate 2014:76; Salam *et al*. 2011:online) refer to a decline in bedside teaching, though there is no documented evidence to that effect at MNRTH. This study intended for its findings to lead to recommendations to improve teaching and learning at the workplace, and thereby to address a possible decline in bedside teaching.

While the recommendations generated by this study may not be a panacea for all the challenges of bedside teaching that have been documented (cf. point 6.2.3.2), they can serve as templates that can be used by relevant stakeholders to improve the workplace as a teaching and learning environment. In order to generate recommendations that would be acceptable to the stakeholders; administrators, teachers and students, an all-inclusive approach – the Delphi technique – as explained below was applied.

7.2   SUMMARY OF PROCEDURE

One possible approach the researcher could apply to propose recommendations for improving the workplace as a teaching and learning environment, would be to synthesise the results obtained from the various methods used for data collection and the information from literature. While this approach would produce a list of recommendations, it would be inadequate, as it could easily be labelled as the researcher's own recommendations. Therefore an approach was chosen and built into the conceptualisation of this research study, that would allow a wider audience at the workplace to claim ownership of the recommendations. This all-inclusive approach engaged a variety of stakeholders who were involved in teaching and learning of undergraduates at the workplace, including

undergraduate medical students, as claim-holders, on the one hand, and administrators and teachers of undergraduates, as duty-bearers, on the other hand. These stakeholders were involved from quite early in the process, when they were requested to suggest ways of improving teaching and learning at the workplace. During data collection from the students, after they had completed the DREEM questionnaire, each student participant was requested to make three recommendations for improving teaching and learning at the workplace. During focus group discussions with the students, they were again requested to make recommendations for improving the workplace as a teaching and learning environment. Data from the administrators and teachers was collected using key informant interviews and, at the end of each interview, the key informant was requested to make recommendations for improving teaching and learning at the workplace. After compiling all the submissions from the various stakeholders and grouping them into thematic areas, a total of 51 recommendations were generated and subjected to the Delphi process. The results of this quite elaborate process of generating recommendations for improving teaching and learning at the workplace meant that these recommendations were still individual discernments, and could pass as mere suggestions. The next step was to distil these individual discernments into recommendations that could be acceptable, feasible and sustainable – this represented the ultimate aim of this study, and the major contribution it would make to improving teaching and learning at the workplace.

The individual discernments were refined using a three-round Delphi survey to generate recommendations for improving teaching of and learning by undergraduate medical students at the workplace. In this chapter, the results of the Delphi survey are presented. The Delphi technique is a scientific method that enables effective expression of individual assessments, upon which convergence of opinion among experts on a particular subject can be achieved. This Delphi technique attempts to answer the "what should be" question, and it is well suited for generating recommendations about particular issues in situations where different opinions may exist. A more detailed description of the Delphi technique is given in Chapter 3 (cf. point 3.5.3).

7.3   THE DELPHI SURVEY

The Delphi survey was administered to experts in medical education who were selected from MakCHS and MNRTH, the principal study site. Other experts were selected from two other universities in Uganda that provide undergraduate medical education, namely,

Mbarara University of Science and Technology and Busitema University. Additional experts were selected from two universities outside Uganda, from University of Zimbabwe and Mekele University in Ethiopia. These experts were involved to create richness in the data for possible application beyond MakCHS. The additional experts were selected from universities in Africa, because of the likelihood of similarities in the teaching and learning environments.

The Delphi questionnaire was sent to the participants by email. Several reminders were sent by email and, where possible, an SMS was sent to remind the participants to complete the survey.

A pilot study was done with five experts, who were later excluded from the final study. The purpose of the pilot was to assess if the questionnaire was fit for purpose and to learn certain lessons, by determining acceptability, testing response rates and the time it would take to respond, on average, to receive the responses (completed questionnaires), if at all, and to identify unclear terms.

Responses were obtained from three of the initial five experts. The three responses were obtained after sending at least two email reminders, as well as face-to-face reminders. From this experience it became clear that the process to complete the Delphi survey was going to be a protracted one.

The pilot questionnaire comprised 56 suggestions or recommendations, which had been derived from the students and the key informants (administrators and teachers), as explained in Section 7.2. The main comment that arose from the pilot was that the questionnaire was rather too long, and that it required careful thought before completion. After thorough scrutiny, the recommendations were reduced to 50, distributed over four Sections, namely,

A. Bedside teaching and curriculum implementation (18 recommendations);
B. Teaching platforms/workplace learning/clinical placement (15 recommendations);
C. Faculty development (9 recommendations); and
D. Planning/collaboration/budgeting /procurement (8 recommendations).

The key to answering the questionnaire was to make a choice from three options: **"Must have/Essential", "Good to have"** and **"Unnecessary",** in reference to each of the suggested recommendations for improving teaching and learning at the workplace (cf. point 3.5.3.2).

The basic structure of the Delphi questionnaire was the same for the different rounds and is therefore discussed here once (cf. Appendix L). The recommendations remained the same for each round, save for one that was introduced into Round 2, because it appeared as a concern of a number of participants after Round 1, to make it 51 recommendations**.** A brief description of the sections is given below.

Section A, labelled Bedside teaching and curriculum implementation, focused mainly on recommendations related to bedside teaching, where the teacher and the students are in the clinical area, which could be the in-patient ward, emergency ward, outpatient clinic, operating theatre or laboratory. There were 18 recommendations that required responses by choosing one of the three options listed above, and a space was provided for the participants to add any comments, if they wished to do so.

Section B, labelled Teaching platforms/workplace learning/clinical placements, focussed on issues such as clinical exposure before starting the actual clinical placements, provision of duty rooms at the workplace for students at night, alternative teaching platforms (other than Mulago), ward side rooms/conference rooms, etc. This section had 15 recommendations to choose from, with a space for comments.

Section C, titled Faculty development, and had 9 recommendations to choose from. The recommendations in this section mainly focused on dual appointments for hospital and university staff, skills development of clinicians regarding workplace teaching and learning, orientation of all workplace staff about the need to support student learning, meetings between hospital and university staff, and contribution of clinical activities and teaching to career development, among other matters. Each recommendation had a space for comments by participants.

Section D was titled Planning/collaboration/budgeting/procurement, and it included 8 recommendations concerning provision of learning aids to the students by the university, contribution of equipment and supplies to the hospital (workplace) by the university,

formation of collaborative teams, including hospital and university staff, for research, harmonisation of staff appraisal regardless of employer, and sharing of resources, such as research grants and income from private patients. There was a space for comments against each recommendation.

The Delphi process started with screening of potential participants using a short checklist, which was sent via SurveyMonkey[TM] (cf. Appendix K). The checklist was sent to 34 potential medical education experts from MakCHS and MNRTH, the principal study sites, three other universities in Uganda with undergraduate medical students, namely, MUST, Gulu University and Busitema University, as well as five universities outside Uganda but within Africa, namely, University of Zimbabwe, University of Cape Town, University of Pretoria, University of the Witwatersrand and Mekele University in Ethiopia. The experts were selected because they were known to the researcher as experts in medical education who would provide valuable insights into undergraduate medical education. The potential experts also fulfilled the recommendations for inclusion in the expert panel for a Delphi process, that is, experience, willingness to participate, having time to participate and possessing good communication skills.

The purpose of the screening tool was to assess for experience in teaching undergraduates, willingness to participate, having time to complete all rounds of the Delphi and good communication skills (Giannarou & Zervas 2014:65). Out of the 34 potential experts, 17 responded to the screening tool; eight from MakCHS, three from MNRTH, one from Busitema University, one from MUST, one from Mekele University, Ethiopia, two from University of Zimbabwe and one from the University of the Witwatersrand (the latter was excluded from the study because she did not teach MBChB students – participant 13) (cf. highlight in Table 7.1). The final number of participants included in the Delphi survey was therefore 16. The results of the screening tool are shown in Table 7.1.

TABLE 7.1: RESULTS OF SCREENING OF EXPERTS FOR PARTICIPATION IN DELPHI STUDY

Ser No	Ptcp's initials	DYTMS	NAoMS/H	CT/PC	YRs UGT	ENGp	AcaQual	MeDT	MeDQ	WLGAQn	ADNInfo
1	BRB	Yes	MNRTH	Yes	>5	Yes	Master's/Msc	No	N/A	Yes	NC
2	BJK	Yes	MakCHS	Yes	>5	Yes	PhD	Yes	Fellowship	Yes	Researcher
3	CM	Yes	U-Zim	Yes	>5	Yes	FFDRCSI	Yes	Master's	Yes	NC
4	FA	Yes	Mekele-Eth	Yes	>5	Yes	MD, cert specialist	Yes	Fellowship Master's	Yes	NC
5	KJM	Yes	MNRTH	Yes	>5	Yes	Master's	No	N/A	Yes	NC
6	KJ	Yes	MakCHS	Yes	>5	Yes	Master's	No	N/A	Yes	NC
7	KSC	Yes	MakCHS	Yes	>5	Yes	Master's, FCS (ECSA)	Yes	Master's	Yes	Trained in student-centred curriculum
8	KO	Yes	MakCHS	Yes	>5	Yes	Master's	No	N/A	Yes	
9	MJB	Yes	MNRTH	Yes	>5	Yes	Master's	No	N/A	Yes	NC
10	NA	Yes	MakCHS	Yes	>5	Yes	PhD	No	N/A	Yes	UG teaching for 11 yrs
11	NCE	Yes	U-Zim	Yes	>5	Yes	Master's MRCP	Yes	Fellowship	Yes	Medical educator >20yrs
12	NJ	Yes	MUST	Yes	>5	Yes	PhD	No	N/A	Yes	Nc
13	PBA	Yes	Wits-SA	Yes	>5	Yes	Msc Occup therapy	Yes	Fellowship	Yes	Not training MBCHB
14	SKB	Yes	MakCHS	Yes	>5	Yes	Master's/Fell	Yes	Master's/Fell	Yes	Teaching paed
15	TJK	Yes	MakCHS	Yes	>5	Yes	PhD	No	N/A	Yes	Medical educator >40yrs
16	WJN	Yes	Busitema	Yes	>5	Yes	PhD	No	N/A	Yes	Attended seminars on UG teaching
17	OVK	Yes	MakCHS	Yes	>5	Yes	Master's	No	N/A	Yes	NC

Key			
ADNInfo	Any additional information	**Mekele-Eth**	Mekele University, Ethiopia
ENGp	English proficiency	**MUST**	Mbarara University of Science and Technology
NC	No comment	**Wits-SA**	University of the Witwatersrand – South Africa
AcaQual	Your academic qualification	**U-Zim**	University of Zimbabwe
MeDQ	Medical education qualification	**Ptcp's initials**	Participant's initials
CT/PC =	Are you a clinical teacher/practicing clinician?	**WLGAQn**	Are you willing to participate in the survey/answer the questionnaire?
DYTMS =	Do you teach in a medical school?	**YRsUGT =**	Years of teaching undergraduates
MeDT =	Any training in medical education	**NAoMS/H =**	Name of medical school/hospital

The Delphi questionnaire for Round 1 was sent to 16 participants on 30 April 2017 and the last response in the final round (Round 3) was received on 30 August 2017. The total period of data collection for all three rounds of the Delphi survey was four months. Round 1 involved analysis of contributions by 15 participants who responded to the survey on time, after two reminders had been sent seven days apart. The 15 participants continued their participation during the data collection phase to the end, and the results presented here are based on analysis of the views of the 15 medical education experts. Sub-analysis, based on the input of the experts from the different institutions, was not done, because of the small sample.

7.4 RESULTS AND DISCUSSION OF THE DELPHI FINDINGS

The Delphi process is described here briefly and the findings presented for each round. The final outcome of the Delphi study is presented at the end of this chapter.

7.4.1 Round 1 of the Delphi survey

Round 1 of the Delphi study involved sending individual emails to the 16 selected participants to inform them about the attached Delphi questionnaire and to provide them with instructions on how to complete it. Additionally, the consent information document, as approved by the Institutional Review Board of Makerere University School of Medicine, duly stamped, was also sent as an attachment (cf. Appendix M). The participants were requested to complete the questionnaire in a stipulated time and informed that gentle reminders would be sent to them should they fail to respond in time. They were requested to answer all the questions as truthfully as possible.

Once the responses from all participants had been received for Round 1, consensus was calculated for 15 out of 16 participants (one participant did not respond to the Delphi survey on time, and was excluded at the time of analysis). Consensus was calculated based on the predetermined level of 70% (cf. point 3.5.3.2). Literature indicates that consensus can be set at any value between 51% and 80%, though 70% is considered the standard (Avella, 2016:305; Giannarou & Zervas 2014:65; Penciner *et al*. 2011:e333). Consensus measurement for Delphi studies has been done in several ways; one of which is using a simple majority of 51% of participants who select recommendations deemed highly important, or using a Likert scale when measures of central tendency, such as the

interquartile range or standard deviation, are applied (Giannarou & Zervas 2014:65). For this study, assessment by level of importance was used, and consensus was decided by majority percentage of 70%. This meant that, if ≥70% of all participants selected a particular recommendation, consensus was deemed to have been achieved for that recommendation.

Of the 50 recommendations on the first round, consensus was reached on 24 of them. Most of the recommendations that achieved consensus in Round 1 were in the section of faculty development (8 out of 9), followed by the planning/procurement sub-section (6 out of 8). The sub-section of bedside teaching and curriculum implementation had the fewest recommendations, with consensus achieved on 4 out of 18 recommendations in the first round, while teaching platforms/workplace learning returned consensus on 6 of the 15 recommendations.

The findings were shared with all participants by individualised email messages. The email message had two attachments: One was a letter of appreciation for their participation in the Delphi survey and informing them that there would be another round (cf. Appendix N), and the other was the Delphi questionnaire with the consensus recommendations highlighted and comments from the various participants indicated in the comment section (cf. Appendix O).

7.4.2 Round 2 of the Delphi study

The Round 2 questionnaire had 27 recommendations – 24 recommendations fewer than the original 50 in Round 1. One recommendation (Question 19a) was introduced by the researcher, as it appeared consistently as a concern of the participants in Round 1. This recommendation was, "There should be assessment attached to clinical exposure sessions to encourage learning." The reason for sharing the results from Round 1 with the participants was so they could reflect on their earlier responses and refer to the comments by the other participants in responding in Round 2. It was hoped that the participants could be persuaded to either change their opinions or maintain their choices in the next round, as part of consensus building.

The participants were requested to complete the questionnaire by a stipulated date and to expect gentle reminders in case of failure to respond on time. The instructions for

completion of the questionnaire were similar to those of Round 1, and were part of the questionnaire in the preamble.

Once responses had been received from all the participants (15 out of 15), only 2 out of 27 recommendations had achieved consensus of more than 70%, leaving another 25 recommendations for Round 3, the final round. The only recommendations to achieve consensus were in the section on bedside teaching/curriculum implementation, and related to opportunities for certification for students' attendance, and allowing students to write in the patient files.

A letter explaining the findings of Round 2 was sent to the participants (cf. Appendix P). The results of Round 2, with the recommendations that had achieved consensus highlighted, and the comments by all the participants, are shown in Appendix Q.

7.4.3 Round 3 of the Delphi study

After excluding the recommendations where consensus had been achieved during Round 2 (2 recommendations), Round 3 of the questionnaire, with 25 recommendations, was sent to the participants via individualised emails; they were informed that this was the third and last round. During the feedback for Round 2, the participants had been made aware of their freedom to change or maintain their choices in previous rounds, and they were requested to reflect on their individual responses, and those of others, when responding to the final round. They were implored to respond to the questionnaire as truthfully as possible and in a timely manner. After Round 3, consensus was achieved on 4 out of the 25 recommendations (cf. Appendix Q).

Consensus and termination of the Delphi process was determined ex-ante (prior to commencement of the survey). Consensus was considered as having been achieved on any item in the survey where 70% or more of the participants had responded by indicating one of the three options, **Must have/Essential**, **Good to have/Useful** or **Unnecessary.** The stoppage criterion was also predetermined – the Delphi survey was a three-round process – and was not based on calculation of stability. This decision is supported by literature, which suggests that three rounds are appropriate and that time constraints and other factors could limit the number of iterations (Von der Gracht 2012:1525). In hindsight, it was for the good, because of apparent participant fatigue, as indicated by delays in

providing responses to the Delphi survey and the reduction in the number of participants giving comments on individual recommendations.

7.5   FINAL OUTCOME OF THE DELPHI SURVEY AND STUDY CONTRIBUTION

In total, 51 recommendations were subjected to the Delphi process seeking consensus; 50 of the recommendations were part of the initial questionnaire, and one statement was added for Rounds 2 and 3 after several participants provided it as a comment in Round 1. The initial 50 recommendations were generated from literature and comments from a cross-section of stakeholders in undergraduate medical education at MakCHS. The stakeholders included students of MakCHS who had participated in focus group discussions and the DREEM (cf. Chapter 5), administrators and lecturers of MakCHS, as well as administrators and specialist doctors at MNRTH who had participated in the key informant interviews (cf. Chapter 6). All these stakeholders were asked to make recommendations for improving the workplace as a teaching and learning environment, and these recommendations were compiled for inclusion in the Delphi survey. The Delphi technique was well suited for this purpose, because of its inherent characteristics of anonymity and iteration, which allows participants to express their opinions without undue influence from their peers or senior colleagues, thereby, minimising issues of group dynamics, where dominant members of the group may control the discussion and its eventual outcome (Avella 2016:305).

Consensus was defined as all recommendations for which over 70% of participants selected any of the three options of, **Must have/Essential**, **Good to have/Useful** or **Unnecessary** for any particular statement. At the end of Round 3, **consensus had been achieved on 30 recommendations.** All the recommendations where consensus had been achieved related to the option of **Must have/Essential.** None of the other options achieved consensus. This is probably the case because most of the recommendations were generated from interaction with administrators, teachers and students. **Table 7.2** shows the recommendations and suggested stakeholders to whom they are directed for implementation. In brackets is information regarding the section (cf. A,B,C,D) from which the recommendation was grouped in the Delphi survey (cf. point 7.3), the round of the survey at which consensus was achieved (R1,R2,R3) and the level of consensus by percentage (e.g. 73) of all participants (medical education experts). The degree of consensus is reported as the percentage of participants selecting the recommendation as a

Must have/Essential. Details of the consensus scores for all recommendations in the Delphi survey and round in which consensus was achieved, are indicated in Appendix R.

TABLE 7.2: STUDY CONTRIBUTION: RECOMMENDATIONS WITH CONSENSUS ($\geq$70%) ON THE DELPHI SURVEY

TO THE TEACHERS AND HEADS OF DEPARTMENTS:

1.	A list of clinical learning activities expected to be covered over the semester should be available to the students **(A-R1;100).**
2.	Senior teachers/researchers /professors should provide patient care services at the workplace as good role models **(A-R1;93.3)**
3.	A list of available clinical learning opportunities should be generated by each department/unit/placement **(A-R3;80.0)**
4.	Opportunities for certification of attendance/signature for clinical learning should be part of scheduled bedside teaching and learning **(A-R2;73.3)**
5.	Students in their final year should be allowed to clerk, write and make treatment recommendations in the patients' files **(A-R2;73.3)**
6.	Teaching of undergraduates by graduate students (SHO) should be made mandatory with log entries for the SHO after each teaching session **(A-R3;73.3)**
7.	There should be management protocols for all common conditions in order to standardise teaching for the undergraduate students **(A-R1;73.3)**
8.	There should be an evaluation mechanism of teachers by the students during clinical placements **(A-R1;73.3)**
9.	Clinical exposure should include orientation to department-specific skills in history taking, physical examinations, procedures and investigations **(B-R1;73.3)**

TO THE UNIVERSITY ADMINISTRATION/MANAGEMENT

10.	University admissions should be commensurate, in the long term, with the facilities for workplace learning during clinical placement **(B-R1;93.3).**
11.	There should be an accreditation system for all teaching and learning environments (teaching hospitals) for medical education **(B-R1;93.3)**
16.	The university needs to play a bigger role in providing learning aids on the wards for clinical training of undergraduates **(D-R1;93.3)**
12.	Teaching sites (satellite hospitals/general hospitals) for undergraduates should be established outside super-specialised hospitals **(B-R3;86.7)**
17.	There is need to establish a Medical Education/Student Support Centre to promote/coordinate excellence in teaching and learning **(C-R1;85.7)**
13.	Student clinical placements should be full time in each department (avoid timetabling that requires students in more than one place) **(B-R1;80)**
14.	There is need to design new criteria for admission to medical school, such as pre-entry exams, to improve on the quality of undergraduate students **(B-R1;80)**

TO THE UNIVERSITY/HOSPITAL ADMINISTRATION/MANAGEMENT (JOINT TEAM)

19.	All clinical teachers should be oriented on how to balance the needs of the student, the patient, the teacher and the clinical workplace **(C-R1;100)**
20.	Professional and ethical conduct, as well as how to give feedback, should form part of faculty development sessions **(C-R1;93.3)**
21.	To support learning, all hospital staff should be oriented on the importance of students' participation in ward activities **(C-R1;93.3)**
22.	Regular monitoring and evaluation of the teaching and learning environment should be done through benchmarking **(C-R1;86.7)**
23.	Regular meetings on how to improve workplace learning should be held between specialists, lecturers and administrators from the two institutions **(C-R1;86.7)**
25.	Staff appraisals should include an evaluation of the dual responsibility of patient care and student learning, regardless of employer **(D-R1;86.7)**

26. Wards should have dedicated side rooms for discussion of critical cases/details (risk factors, prognosis, differentials) for deeper learning **(B-R1;86.7).**
27. Collaborative teams should be established between the university and the hospital to identify and drive research agenda **(D-R1;85.7)**
24. Clinical teaching should contribute significantly to the requirements for promotion and career development for clinical teachers **(C-R1;80)**
28. Joint meetings should be arranged to discuss how to share resources on locally generated funds, such as research grants and private patients **(D-R1;80)**
25. To harmonise expectations and commitment, teaching staff from the university and the teaching hospital should have dual appointments **(C-R1;73.3)**
26. Opportunities for lecturers to train in super-specialised areas should be provided by the university for a better workplace teaching of students **(C-R3;73.3)**
29. The hospital should function as a teaching hospital by procuring materials and equipment that add value to teaching and learning **(D-R1;73.3)**
30. There should be equipment and supplies provided by the university on the different wards designated exclusively for students' use **(D-R1;73.3).**

The Delphi technique attempts to answer the "what should be" question and the recommendations above are suggestions of what should be, in order to improve the workplace as a teaching and learning environment for undergraduate medical students at MakCHS. The recommendations will therefore, be shared with relevant stakeholders for possible implementation. The earlier phases of this of this study were intended for identifying the strengths, opportunities and challenges, as well as the knowledge, experiences and perceptions of the stakeholders regarding the workplace as a teaching and learning environment for undergraduate medical education with the ultimate aim of generating recommendations for improving the workplace as a teaching and learning environment.

Every effort will, therefore, be made to share these recommendations, as well as the process through which they were arrived at, widely, and to be as inclusive as possible, in order to stimulate buy-in by the various stakeholders in undergraduate medical education. Through doing so, it is hoped that the recommendations will be introduced in the workplace and will improve the teaching and learning experience relating to undergraduate medical education. The process of generating these recommendations included the input of experts from other medical schools in Uganda and a few universities outside Uganda, though in Africa, thus, providing an international flavour to the recommendations. Because most of the issues concerning undergraduate teaching and learning at the workplace are not unique to Uganda and MNRTH, the recommendations listed in Table 7.2 could be adapted for use as templates for improving workplaces as teaching and learning environments for undergraduate medical education in other medical schools across the African continent.

7.6 CONCLUSION

In Chapter 7, the contributions this study could make to teaching and learning of undergraduate medical students at the workplace were presented. The contributions were presented as recommendations for improving teaching and learning at the workplace. The process of developing the recommendations was also presented. This process involved using a Delphi survey, which was administered to medical education experts from Makerere University and a few other universities in Uganda and the rest of Africa. This chapter is a culmination of results from the previous chapters (Chapters 5 & 6) and reported on suggestions drawn from stakeholders for improving teaching and learning at the workplace for undergraduate medical education. These recommendations were subjected to a Delphi process for the purpose of consensus building through convergence of opinions of medical education experts. The results of the Delphi process indicate consensus on 30 out of 51 recommendations that had been circulated to 15 medical education experts. It is our hope that these recommendations, after they have been shared with stakeholders, will form the basis for improving teaching and learning at the workplace for undergraduate medical education in Uganda and beyond.

The next chapter will provide a summary of the whole study and present conclusions. Limitations of the study will be discussed. A summary of the research journey will be presented, with highlights on challenges and experiences. Alternative approaches that could have been taken and reasons why the study was done the way it was, will be explained.

CHAPTER 8

CONCLUSIONS, SUMMARY, STRENGTHS AND LIMITATIONS

8.1 INTRODUCTION

In this chapter, the conclusions from the various components of the study will be presented. Significant changes are taking place in health care delivery due to new health system expectations, clinical practice requirements and staffing arrangements. Contemporary medical education has also undergone major changes, from being characterised by traditional, teacher-controlled approaches, to newer approaches that involve student-directed learning, problem-based learning, the use of skills laboratories, and evidence-based medicine. These changes are coupled with the availability of new information and technologies, a shift in patient numbers and desires, case mix and demographics, such as age, gender, education and income level, employment opportunities and demands. These changes have important implications for the way medical students are prepared to provide quality health care once they qualify. It is not clear, however, whether clinical education at the workplace at MNRTH has kept pace with or been responsive enough to these changes. The study set out to assess the suitability of the workplace at MNRTH, as a teaching and learning environment, based on the curriculum for undergraduate medical students at MakCHS. This was done using a cross-sectional descriptive research design to determine whether the workplace fulfilled the requirements for successful implementation of the undergraduate medical curriculum and attempting to answer the following research questions:

i.   *What are the requirements of the undergraduate medical curriculum during the students' clinical placements?*

ii. *How does the workplace fulfil the requirements of the undergraduate medical curriculum?*

iii. *What recommendations can be made to improve teaching and learning at the workplace?*

Because of the complex nature of the research phenomenon, a mixed methods approach was adopted. Using this approach, the suitability of the workplace as a teaching and learning environment was evaluated through a document review of the undergraduate

curriculum; an exploration of the perceptions and experiences of the different stakeholders, administrators, teachers and students about the interaction between the undergraduate curriculum and the teaching and learning environment, and a Delphi survey to generate recommendations for improvement of teaching and learning at the workplace for undergraduate medical education. Implementation of the recommendations at the workplace would, consequently, produce competent health professionals who are responsive to the contemporary demands of teaching, research and service provision. This approach was the basis for the conceptual framework.

To implement the research design, the study was conducted in three phases using a sequential exploratory strategy. Initially, a background understanding of the undergraduate curriculum was gained through a document review that provided context. Subsequently, the study focused mainly on an interpretivist paradigm, where a detailed picture of the suitability of the workplace as a teaching and learning environment was built through in-depth accounts of the different stakeholders. This phase was followed by an iterative process of developing recommendations for improvement of teaching and learning at the workplace for undergraduate medical education using a Delphi survey.

8.2   SUMMARY

A summary of the research process/fieldwork and conclusions drawn is given below.

8.2.1   Phase 1: The document review

Phase 1 was aimed at examining the undergraduate medical curriculum of MakCHS and its application during students' placements during workplace learning at MNRTH (cf. point 3.5.1). This was done using a document review process. The documents reviewed included the undergraduate curriculum and teaching schedules that, in essence, act as the curriculum implementation guide. During the document review, the emphasis was on the learning objectives and four of the nine domains of competence stipulated in the undergraduate curriculum at MakCHS. The four tracer domains selected for the document review included **professionalism and ethical practice, medical knowledge, clinical skills and patient care, and assessment**. Based on these tracer domains, it was possible to review the curriculum in terms of context, processes and outcomes. The purpose

of the document review was to obtain insights into the expectations and operations of the undergraduate curriculum by using text to provide context.

The results of the document review indicated that the curriculum had well-stated learning objectives, which used appropriate verbs that correspond to Bloom's taxonomy. The expectations of the curriculum were also in accordance with Miller's pyramid of competence development for the different student levels. The students were expected to demonstrate professionalism and ethical practice, as stated in the curriculum, based on the learning opportunities that were implicitly stated in the teaching and learning methods. A challenge noted was that most of the clinical teaching was opportunistic, with few scheduled workplace teaching sessions based on disease conditions or organ systems. This challenge could, however, be mitigated by the large variety of patients and case mix at the workplace. The curriculum also had a good educational impact through its methods of assessment, the OSCEs and long-case presentations, which encouraged students to spend more time at the workplace to acquire clinical skills and patient care competencies.

The undergraduate curriculum requires the students to develop their competence in terms of professionalism and ethical practice, medical knowledge, clinical skills and patient care through working with patients at the workplace. The objectives of the curriculum were supportive of this expectation of the undergraduate curriculum.

The findings in the document review that had been conducted, therefore, indicate that implementation of the undergraduate curriculum at MakCHS can lead to the production of competent graduates who are responsive to the contemporary demands of teaching, research and services provision to the patients and society upon graduation.

The results of the document review provided background upon which discussion points with the stakeholders were developed, leading into Phase 2 of the study. Phase 2 of this study investigated whether the workplace, as a teaching and learning environment, from the perception and experiences of various stakeholders, was responsive to the undergraduate medical curriculum by way of having workplace affordances and invitational qualities for effective teaching and learning to take place.

8.2.2 Phase 2: Perceptions of the workplace as a teaching and learning environment

Phase 1 examined the undergraduate curriculum and generated evidence that the undergraduate medical curriculum at MakCHS was fit for purpose. The implementation of the undergraduate curriculum can, however, only be done effectively with input from administrators, teachers and students, as stakeholders, and a conducive teaching and learning environment.

This was the subject Phase 2 of this study, which aimed to evaluate the perceptions and experiences of administrators, teachers and students about the workplace at MNRTH as a teaching and learning environment for undergraduate medical students at MakCHS (cf. point 3.5.2). The research question posed was the following: How does a workplace such as MNRTH, as a teaching and learning environment, fulfil the requirements of the undergraduate medical curriculum, from the perspectives of the administrators, teachers and medical students?

Because of the multiplicity of stakeholders involved, a mixed methods approach was adopted, in an attempt to reach meaningful conclusions by way of triangulation. Data was collected from students by administering an adapted DREEM questionnaire and conducting focus group discussions, while data was collected from administrators and teachers of undergraduate medical students by means of key informant interviews.

8.2.2.1 *Student perceptions and experiences*

Analysis of the data from the adapted DREEM questionnaire provided an overall picture of the workplace as a teaching and learning environment, as well as student perceptions in five different sub-categories: **perception of learning, perception of teachers, academic self-perception, perception of atmosphere and social self-perception.** Because the DREEM scores provide a snapshot of the perceptions of students about the learning environment, focus group discussions were held with students to obtain deeper insight into the reasons behind the students' perceptions; these results are presented together.

Results from the DREEM indicated that, **overall**, the teaching and learning environment was perceived as having more positives than negatives. The reasons for the positive perception, obtained from the focus group discussions, centred on the availability of patients and wide case mix as a learning resource, and unrestricted access to patients at the workplace for learning purposes. Availability and variety of patients/cases at the workplace, as a teaching and learning environment, creates learning opportunities for students, who are exposed to a range of physiology and pathology that they are likely to encounter once they qualify, thus fulfilling the requirements of the undergraduate curriculum for students to work with patients at the workplace for competence development.

A small percentage of students, however, indicated that the teaching and learning environment had plenty of problems that needed to be addressed. Issues raised included the large number of students (overcrowding), inadequacy of workplace affordances, and shortage of equipment and supplies. The finding that the perception overall, by the students, of the teaching and learning environment was more positive than negative meant that the teaching and learning environment was authentic, as the students got an idea of what clinical practice is really like and this is a good driver of learner agency. However, the negative perceptions should not be ignored, and should form the focus of efforts to improve of teaching and learning at the workplace.

Perceptions, according to the sub-categories of the DREEM, returned similar results. While the students' **perception of learning** was positive overall, they expressed the desire for a more focused approaching to teaching, better use of clinic time, increased clarity of learning objectives, and a shift in emphasis, from factual learning in the classroom to application, analysis and synthesis of concepts, to real patient situations. The students desired more than they were getting at the workplace in terms of learning.

The students' **perception of teachers** revealed that the majority of the students perceived the teachers as moving in the right direction, with a small percentage perceiving the teachers as model teachers. An important finding from the DREEM was that, while the students perceived the teachers as being knowledgeable, the teachers did not score highly on other attributes of good clinical teachers. The findings from the DREEM, that the teachers were in need of training, was validated by the students during the focus group discussions, when they said that, "the teachers needed to be taught how to teach".

There is no contradiction here, as the students perceived the teachers as being knowledgeable, though in need of further training, with a focus on clinical teaching, because clinical teaching demands more from the teacher than being a medical content expert does. The clinical teacher is expected to be a role model, an information provider, a facilitator and assessor, as well as a resource material creator. The kind of teacher that has all-round capabilities is what is required for proper implementation of the curriculum and workplace learning.

In terms of **academic self-perception**, most of the students perceived themselves as capable of performing well, and that much of what they learnt was relevant to a career in health care. The few that were dissatisfied with the status quo alluded to the inadequacy of opportunities for supported participation or practise. The workplace, therefore, was supportive of learning, but the message for the teachers is that students need more opportunities for hands-on practise under supervision, which is a prerequisite for competence development during workplace learning.

As for **perception of atmosphere,** most of the students had a positive perception of the learning atmosphere. Some students, however, perceived the atmosphere as being characterised by many issues that needed changing, including a tense atmosphere during ward rounds, improper timetabling, and the stress of work. The issues that created negative perceptions should be cause for concern, as this may negate the positives that accrue from all the other attributes. The issues raised can be addressed through faculty development and proper planning with workplace learning in mind.

In terms of **social self-perception**, an almost equal number of students reported that the environment was not too bad, as those who reported that it was not a nice place. Cumulatively, the negative social self-perception outweighed the positive, with two items in this sub-scale returning mean values less than 2.0 on the DREEM analysis, indicative of real problem areas that required to be examined more closely. Students were most concerned about the meals and places of convenience – these are basic needs in Maslow's hierarchy of needs.

From a community of practice lens, socialisation into the medical profession is part of competence development. Students would feel most welcome and accepted when they can interact freely with their peers, near-peers, residents, practicing physicians and lecturers,

who constitute the medical school community. A negative social perception about the workplace during teaching and learning may interfere with this socialisation into the medical community. Failure to socialise may have important implications for students as they develop their identity, from that of students to that of socially competent practicing doctors.

Based on student perceptions, the workplace has a number of positives regarding learning resources, such as variety of patients that are accessible, which creates good learning opportunities. The workplace could pass as a good teaching and learning environment in as far as implementation of the curriculum is concerned. The negative perceptions and the specific areas of concern, such as overcrowding and inadequate invitation qualities at the workplace, however, need to be addressed if MakCHS is to produce competent health professionals from its graduates, who are capable of meeting the demands of contemporary medical practice.

8.2.2.2   *Administrators' and teachers' perceptions and experiences*

Responses of administrators and teachers, which were collected using key informant interviews, revealed mixed perceptions about the teaching and learning environment. While some reported that the learning environment was enabling, others reported that there were many challenges at the workplace that needed to be addressed in order for teaching and learning to take place effectively.

Factors that created the perception that the workplace was enabling, included adequate patient numbers, case mix and unrestricted access. The large patient numbers and wide case mix afforded students the opportunity to observe their teachers in action while they cared for the patients. Because of the unrestricted access, students also had opportunities to practise taking care of the patients under supervision and with increasing responsibility.

The challenges raised included the shortage of equipment and supplies, and infrastructural inadequacies. This was compounded by an ever-increasing number of students, leading to situations of profound overcrowding, which made it even more difficult for teachers to interact with students on a one-to-one basis and appreciate student needs. In such a situation, it is difficult for teachers to identity gaps in students' knowledge and skills and to address them adequately as part of formative assessment. The shortage of equipment and supplies compromised the learning experience, as teachers were often forced to improvise.

This was especially common when giving much-needed patient care in emergency situations. Being forced to improvise on a continuous basis promotes the hidden curriculum, where certain practices, which may be improper, can be transmitted without them being acknowledged openly. The hidden curriculum is not always undesirable for learning; if positive role models can be identified amongst the peers who ordinarily transmit the hidden curriculum, the positive role models can be accepted as a norm or culture.

Shortages were, however, not seen as a negative by all participants. Some teachers and administrators perceived the shortages as a reality check, because it prepared students for the real world of clinical practice; made them more innovative and resilient (fit-for-purpose) in the face of challenges that are a reality when students qualify and enter practice. Be that as it may, a situation of chronic shortages compromises the quality of care the patients receive, and the quality of the learning experience for the students. In the long run, this situation could affect the students' choice of career when they graduate, as they see no satisfaction in providing clinical care to patients under these conditions. Additionally, infrastructure, in terms of bed screens and ward side rooms, were in short supply, even though these facilities are important for patient privacy. Patients may not be as receptive to the students at the workplace if the patients lack the assurance of privacy during teaching and learning sessions.

The demands on clinicians to provide care to an ever-increasing number of patients, as well as teach an equally increasing number of students within finite infrastructure with very limited resources, creates an added strain on clinicians. On the other hand, teaching at the workplace added value to the clinical encounter, making it possible for students to explore the patients' clinical presentation in more detail. The clinician-patient interaction was even more informative for the students, because they learned at the workplace as well as from the teachers and the patients.

The workplace also lacked adequate social services, such as common rooms, conference rooms, canteens and washrooms. These facilities encourage the students to stay at the workplace beyond normal working hours, or to utilise spare moments when there is no teacher on the ward, to have peer discussions and search out opportunities to practise performing clinical tasks with progressive independence, based on their level, without the pressure that is typical of a normal ward round.

An important challenge the teachers noted was the absence of learner agency, that is, the intentionality and actions that shape student participation in the learning process. The teachers reported that students did not show enthusiasm to learn by actively seeking out learning opportunities at the workplace or interacting with the teachers as much as possible. Low learner agency was probably influenced by factors such as inadequate workplace affordances or engagement opportunities, which had been pointed out by the students. While the students, as claim holders, are entitled to teachers with the right skills and motivation to teach them, students also have to show enthusiasm to learn. Meanwhile, the teachers, as duty bearers, have the responsibility to ensure that they themselves are adequately trained in clinical teaching, so as to provide the much-needed invitational qualities, such as role modelling, at the workplace. The teachers occasionally exhibited inadequacy in clinical teaching skills, by failing to recognise and appreciate the limitations of the students in terms of knowledge and experience. Consequently, they labelled students as incompetent, which traumatised students and had a negative impact on learner agency.

The timetabling and duration of clinical experience created another challenge. The organisational arrangements were such that clinical rotations were too short to accord the students adequate exposure time at specific learning environments at the workplace and for the teachers to interact with the students long enough to help them master the concepts. Duration of exposure is important for acquiring competence as practice is learnt by practising.

The organisational arrangements at the workplace created another challenge, as there was ambiguity regarding the roles and responsibilities of the university and the hospital in planning for the resources that go into teaching of and learning by undergraduate medical students. Each of these two stakeholders; MakCHS and MNRTH believed that the other wasn't doing enough. While the two institutions shared a common goal in as far as delivery of quality health care to the population through research, teaching and patient care was concerned, they had different priorities; with the university emphasising research, and the hospital focusing on patient care, thus leaving undergraduate teaching and learning as an orphaned entity, a "by-the-way". Communication and interpersonal relationships is a very important factor in the moderation of diametrically opposing views and perceptions. A great deal of negative energy, in form of antagonism, was expressed, with little synergism regarding perceptions of each other at the institutional leadership level; this ultimately lead to a workplace that was not a conducive teaching and learning environment for

undergraduates. This is a typical case of, "when the elephants fight, it is the grass that suffers".

The workplace was described by the key informants as both enabling and challenging for the implementation of the curriculum for undergraduate teaching and learning. The challenges were numerous and, therefore, there is need to identify ways of addressing the challenges in order for the workplace to be supportive of teaching and learning and to produce competent health professionals who can ably address the needs of the community and population in terms of teaching, patient care and research.

8.2.3 Phase 3: Generating recommendations for improving teaching and learning at the workplace: The Delphi survey

The overall goal of the study was to understand the interaction between the undergraduate medical curriculum and the workplace as a teaching and learning environment, and to generate recommendations for improvement that could be adopted by the National Council for Higher Education in Uganda as templates for improving teaching and learning in the workplace for medical students. The recommendations were developed through the use of a Delphi survey involving medical education experts (Phase 3 of the study).

The Delphi survey was well suited to this phase of the study, because the recommendations for improving teaching and learning at the workplace were generated by various stakeholders, namely, students, teachers and administrators, and there was need for synthesis and consensus of the recommendations, to determine which of them would be acceptable and feasible. Additionally, because the participants in the Delphi survey (medical education experts) were highly experienced people with diverse views, it was important to use a method that would allow for expression of opinions with minimal overt influence from other participants, which would unduly influence the outcome.

During data collection from the students, teachers and administrators, they were requested to suggest recommendations for improving the workplace as a teaching and learning environment (cf. point 3.5.2). The recommendations they suggested, together with information from literature, formed the basis from which a list was generated for inclusion in a three-round Delphi survey with medical education experts.

The Delphi survey was a three-round process with experts in medical education drawn from medical schools of three universities in Uganda (Makerere, Busitema and Mbarara), as well two other universities outside Uganda, though within Africa (University of Zimbabwe and Mekele University in Ethiopia). The process involved iterative exchanges between the experts, thus allowing for anonymous expression of individual assessments of the suggested recommendations from which convergence of opinion was derived. This convergence of opinion, also referred to as consensus, was determined ex-ante at 70% after three rounds.

Out of 51 recommendations collected from various stakeholders and subjected to the three-round Delphi survey with 15 medical education experts, consensus was achieved on 30 recommendations (cf. point 7.2 and 7.3).

The recommendations were grouped into four categories: those addressing bedside teaching and curriculum implementation, those for the teaching platforms or workplace, those focussing on faculty development, and those for planning/collaboration. The recommendations generated after the Delphi survey were presented in the contributions chapter (cf. Chapter 7; cf. Table 7.2), ranked according to the strength of consensus in each section.

These are the recommendations that, in the opinion of the experts, if adopted and implemented, may lead to improvement of teaching and learning at the workplace for undergraduate medical students It is envisaged that improving teaching and learning at the workplace will lead to training of competent health professionals, who can meet the community's expectations in terms of teaching, research and service provision.

These recommendations are made with the sincere hope that they can be used as templates for improving teaching and learning at the workplace for undergraduate medical students. Every effort will be made to share the recommendations widely among all stakeholders through publications and stakeholder engagement at every opportunity.

8.3   STUDY STRENGTHS AND LIMITATIONS

This study used a mixed methods approach to evaluate the teaching and learning environment for undergraduate medical education in Uganda. At design level, the strength of this study lay in the choice of mixed methods as a design to study the complex

phenomenon of the interaction between the curriculum, the people that implement or benefit from the curriculum, and the environment in which implementation is supposed to happen.

One potential limitation of the document review of the undergraduate curriculum could be the minimal interaction between the researcher and the heads of departments, course coordinators or teachers, so that they could explain the workings of the undergraduate curriculum and the learning schedules as support documents. On the other hand, avoiding this interaction allowed the researcher to assess the curriculum without undue influence by biases of its implementers and the potential effects of the hidden curriculum.

Another potential limitation was the inclusion of only undergraduates in their final two years of study, omitting the views of undergraduates about the workplace as a teaching and learning environment in years one, two and three. It was envisaged that students who had not started formal clinical placements would not be familiar enough with the workplace to give meaningful insights into the suitability of the workplace as a teaching and learning environment.

The focus group discussions did not exclude students who had participated in the DREEM questionnaire, and it could be argued that it probably created bias, as the focus group discussion participants had an idea of the topic of discussion. On the other hand, however, this kind of scenario created good ground for discussion, as the students had an opportunity to express sentiments they were unable to express before, because of the closed nature of the DREEM tool.

The key informant interviews returned a great deal of feedback on experiences and perceptions of administrators and teachers, as they were passionate about the issues affecting the workplace. However, not all these responses could be shared as quotes in the results and discussion of the study findings, although representative quotes were used, as far as possible. This is not unusual in qualitative research, where a great deal of data are gathered, but only a limited amount can be shared as part of the findings.

In hindsight, this study should have included a mechanism for stakeholder feedback, especially to the administrators, during the data collection process, so as to share the

findings, which could create fertile ground for the recommendations to be adopted to improve the workplace as a teaching and learning environment.

8.4   AREAS FOR FURTHER RESEARCH

The following areas for further research are proposed:

- Evaluation of the perceptions and experiences of patients in relation to undergraduate medical students;
- Evaluation of the perceptions of employers, regulatory bodies and other consumers of the medical graduates of MakCHS; and
- Focussed evaluation, at departmental level, of the clinical teaching skills of teachers, through student perceptions and teacher self-assessment, to identify gaps and design faculty development sessions.

8.5   FINAL REMARKS

Evaluating the workplace at MNRTH as a teaching and learning environment has been a humbling experience. Interactions with the various stakeholders revealed a deep-rooted desire among the students to have a better teaching and learning environment, and an equally deep-seated commitment to delivering the best at the workplace by the teachers.

Teachers and students form part of the learning triad, which is completed by the patients. Patients are not in short supply in terms of number and case mix. While the teacher, student and the patient are factors within the wider concept of the teaching and learning environment, the learning ecology is composed of much more than these three elements, and policy, leadership and organisational structures are required to promote synergism, rather than antagonism, for better outcomes.

The recommendations generated by the Delphi survey could be adopted as templates for improving the workplace as a teaching and learning environment for undergraduate medical students in a phased manner, where selected recommendations are implemented at a time.

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APPENDICES

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STUDENT ROTATIONS AT THE WORKPLACE

FOURTH YEAR ROTATIONS SCHEDULE

WEEK/DATES					
OPTION A	Clinical surgery I	Obstetrics and Gynaecology I	Anaesthesia and Critical Care	ENT	Ophthalmology
OPTION B	Clinical Medicine I	Paed and Childhealth I	Anaesthesia and Critical Care	ENT	Ophthalmology
Week 1	A	B	C1	C2	C3
			C1	C2	C3
			C2	C3	C1
			C2	C3	C1
			C3	C1	C2
Week 6	C	A	B1	B2	B3
			B1	B2	B3
			B2	B3	B1
			B2	B3	B1
			B3	B1	B2
Week 11	B	C	A1	A2	A3
			A1	A2	A3
			A2	A3	A1
			A2	A3	A1
			A3	A1	A2
Week 16 and 17	END OF SEMESTER EXAMS				

FIFTH YEAR ROTATIONS SCHEDULE

WEEK/DATES				
OPTION A / OPTION B	Clinical Medicine II	Paed and Childhealth II	Clinical Surgery II	Obstetrics and Gynaecology II
Week 1 - 7	A1	A2	B1	B2
Week 8-14	A2	A1	B2	B1
Week 15	PHARMACOLOGY & THERAPEUTICS			
Week 16&17	END OF SEMESTER EXAMS			

DATA COLLECTION TOOL FOR CURRICULUM REVIEW

The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda

Data Collection Tool 1: Curriculum Review Guide

Department				
Course code & Title				
Semester & Year of Study				
Expected learning objectives/outcomes	Stated		Not Stated	
List of learning objectives/outcomes	1.			
	2.			
	3.			
	4.			
	5.			
Learning opportunities for students	Stated		Not stated	
List learning opportunities as stated in the teaching schedules (timetables)	1			
	2			
	3			
	4			
	5			
Content outlines	Stated		Not stated	
Number of clinical sessions				
Teaching methods	Stated		Not Stated	
List teaching methods	1.			
	2.			
	3.			
	4.			
	5.			
Assessment methods	Specified		Not Specified	
Formative assessment methods	1.			
	2.			
	3.			
	4.			
	5.			
Summative assessment methods	1.			
	2.			
	3.			
	4.			
	5.			
Alignment to learning objectives/outcomes	Yes		No	

The workplace as a Teaching & Learning Environment; Data Collection Tool 1

MAKERERE UNIVERSITY
SCHOOL OF MEDICINE
APPROVED
VALID UNTIL
2 0 SEP 2016
RESEARCH & ETHICS COMMITTEE
P.O.BOX 7072, KAMPALA

PRELIMINARY KEY INFORMANT INTERVIEW GUIDE

The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda

Data Collection Tool 2: Preliminary Key Informant Interview Guide

Preamble

- What are the learning objectives and expectations of the undergraduate medical students for their clinical placement in this department according to the undergraduate curriculum?

    o *The following are the learning expectations of the student during their clinical placement in this department* (**Mention according to curriculum**)

Interview

1. How would you compare the Clinical Learning Environment at MNRTH and the learning needs of the undergraduate medical student?

    a. *Quality of facilities*

    b. *Resources available to the student*

    c. *Access to patients*

    d. *Availability of teachers for supervision (staffing levels)*

    e. *The organisational structure of teaching and learning at the workplace*

2. Describe the preparations undergraduate medical students receive prior to their clinical placements?

    a. Orientation meetings

    b. Induction/overview lectures

    c. Meeting with all members of the dept

3. How can teaching and learning at the workplace provide undergraduate medical students with satisfaction with their clinical experience?

    a. What would make undergraduate students welcome and wanted during your clinical placement?

    b. What would make them feel unwanted/unwelcome?

4. What do you perceive as the strengths/challenges/hindrances/weaknesses of the workplace at MNRTH in the instruction of undergraduate students on the learning of clinical skills?

   a. *Access to patients; patient numbers, case mix, student patient ratios, inter-professional learning opportunities.*

   b. *Continuity of learning experiences; all clinical placements within the hospital*

   c. *Interaction with high quality clinical staff for orientation/induction, ongoing support, feedback*

   d. *Opportunities for reflection, work independently and receiving and giving feedback.*

   e. *Supportive relationship between the workplace and the medical school in terms of exchange of expertise and experience, useable resources, electronic educational resources like ICT,*

   f. *Effective communication processes with clarity about when, who and how to communicate, acting on comments received.*

   g. *Availability and access to resources and facilities; workspaces, ICT, social facilities (kitchen, toilets and common room),*

5. What is your comment on information flow between the administrators, lecturers and students? What areas need to be improved?

6. What do you perceive as the impact of the clinical care offered to patients in view of the need to provide learners with the most useful learning experience?

   a. *Patients' inconvenience*

   b. *Compromise of patient privacy and confidentiality*

   c. *Evidence based care for patients and use of guidelines and protocols*

7. What students' interest would be served by teaching and learning at the workplace and what do you perceive as your role? Does the T&L environment have a bearing on:

   a. *Whether the individual will complete his/her training? (completion rate)*

   b. *How the student works after the training (client safety & satisfaction)*

   c. *Where the individual works after the training (career choice/path)*
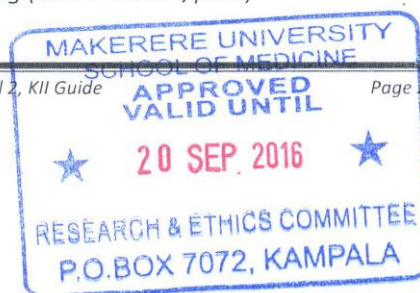
8. How is teaching and learning at the workplace taken care of during the planning phase in terms of staff recruitment, staff development, resources, space, supervision and time

9. From your experience, what influence have clinical lecturers made on the knowledge, skills and attitudes of the undergraduate medical students during their clinical placements at MNRTH?

10. How do students utilize spare moments on the ward? What advice would you give to students on how to utilize these spare moments?

    a. Between teachings, when there is no lecturer.

    b. Beyond scheduled study hours

11. What is your overall impression of the workplace as a learning environment at Mulago National Referral and Teaching Hospital?

    a. *The needs of the workplace vs the needs of the training institution.*

12. What three recommendations would you make in order to improve teaching and learning at the workplace?

PRELIMINARY FGD GUIDE

The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda

Data Collection Tool 4; Preliminary Focus Group Guide for Medical Students

1. What were your expectations prior to going to the workplace for learning?

2. Describe your preparations prior to your clinical placement at the workplace for learning. How would you have wanted to be prepared for the clinical placement? *Did you have any of these? (probes)*

   a. *Orientation meetings*

   b. *Induction/overview lectures*

   c. *Meeting with all members of the dept*

3. How far were your expectations met during your clinical placement? What more needed to be done for you to meet your expectations?

4. Describe your experience during your clinical placement in this dept. *(probes)*

   a. *What and who made you feel welcome and wanted during your clinical placement?*

   b. *What and who made you feel unwanted/unwelcome?*

5. What were your most positive or negative learning experiences during your clinical placement?

6. What is your comment on information flow between the administrators, lecturers and students? What areas need to be improved?

7. How would you compare your experience of teaching and learning in the classroom and at the workplace at MNRTH? *(probes)*

   a. *Availability, access and quality of facilities such as offices and toilets*

   b. *Availability and access to resources for learning, space, ICT*

   c. *Access to patients*

   d. *Availability of teachers for supervision/lecturer-student interaction/feedback*

   e. *The organisational structure of teaching and learning at the workplace*

8. What learning opportunities (promoters) did you find at the workplace during your clinical placement in this department? What more would you have wished for?

The workplace as a Teaching & Learning Environment; Data Collection Tool 4, FGD Guide
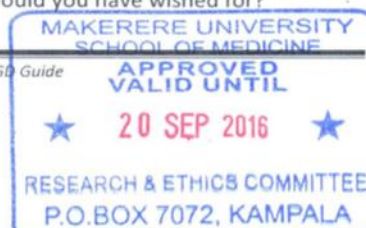
9. What challenges (hindrances) did you find during teaching and learning at the workplace?

10. What assistance did you get from the lecturers to address these challenges during your clinical placement? *(probes)*

    a. *Would you have wished for more support? In which way?*

11. In general, what support did you receive from the lecturers during your clinical placement?

12. How do you utilize your spare moments on the ward? Did you receive any advice on how to utilize the spare moments on the wards? *(probes)*

    a. *Between teachings,*

    b. *When there is no lecturer.*

    c. *Beyond scheduled study hours*

13. What recommendations would you make for improvement of teaching and learning at the workplace?

ETHICAL APPROVAL FROM MAKCHS

MAKERERE UNIVERSITY

P.O. Box 7072 Kampala, Uganda
E-mail: rresearch9@gmail.com

Phone: 256 414 533541
Fax: 256 414 541036/0414 532204

COLLEGE OF HEALTH SCIENCES
SCHOOL OF MEDICINE

RESEARCH ETHICS COMMITTEE

September 21, 2015

Dr. Kagawa Mike Nantamu
Department of Obstetrics and Gynaecology

Category of review
[X] Initial review
[ ] Continuing review
[ ] Amendment
[ ] Termination of study
[ ] SAEs

Dear Dr. Nantamu,

Re: Approval of proposal #REC REF 2015-125

"The Workplace as a teaching and learning environment for undergraduate medical students in Uganda"

Thank you for submitting an application for approval of the above – referenced concept paper.
The committee reviewed it and granted approval for one year, effective September 21", 2015.
Approval will expire on September 20th, 2016.

Continuing Review
In order to continue work on this study (including data analysis) beyond the expiration date, the School of Medicine Research and Ethics Committee must reapprove the protocol after conducting a substantive, meaningful, continuing review. This means that you must submit a continuing report form as a request for continuing review. To best avoid a lapse, you should submit the request six (6) to eight (8) weeks before the lapse date. Please use the forms supplied by our office.

Amendments
During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek School of Medicine Research and Ethics Committee approval before implementing it.

Please summarize the proposed change and the rationale for it in a letter to the School of Medicine Research and Ethics Committee. In addition, submit three (3) copies of an updated version of your original protocol application- one showing all proposed changes in bold or 'track changes,' and the other without bold or track changes.

Reporting
Other events which must be reported promptly in writing to the School of Medicine Research and Ethics Committee include:
Suspension or termination of the protocol by you or the grantor
Unexpected problems involving risk to participants or others

Adverse events, including unanticipated or anticipated but severe physical harm to participants.

Do not hesitate to contact us if you have any questions. Thank you for your cooperation and commitment to the protection of human subjects in research.

Final approval is to be granted by Uganda National Council for Science and Technology.

Documents approved for use along with protocol:
- English informed consent document
- Data collection tool

Yours sincerely,

MAKERERE UNIVERSITY
SCHOOL OF MEDICINE
APPROVED
VALID UNTIL
★ 20 SEP 2016 ★
RESEARCH & ETHICS COMMITTEE
P.O.BOX 7072, KAMPALA

Prof. James Tumwine
Chairperson School of Medicine Research and Ethics Committee

ADMINISTRATIVE CLEARANCE FROM MNRTH

TELEPHONE: +256-41554008/1
FAX: +256-414-5325591
E-mail: admin@mulago.or.ug
Website: www.mulago.or.ug

MULAGO NATIONAL REFERRAL HOSPITAL
P.O. Box 7051
KAMPALA, UGANDA

IN ANY CORRESPONDENCE ON THIS
SUBJECT PLEASE QUOTES NO…

THE REPUBLIC OF UGANDA

23rd Sept, 2015.

Dr. Mike N.Kagawa
Principal Investigator
Dept of Obs & Gyn
Makerere University

Dear Kagawa,

Re: Administrative Clearance MREC: 868: "The Workplace as a Teaching and learning Environment for Undergraduate Medical Education in Uganda."

The Mulago Research and Ethics Committee considered your request and hereby grant you permission to carry out the above study up to 20th Sept, 2016.

You are reminded to comply with the provisions of the approved protocol and to follow the guidelines of Uganda National Council for Science and Technology in carrying out this research study.

You will be required to submit reports of serious adverse events and protocol violations whenever they occur.

The study is subject to monitoring by the Mulago research and ethics committee at any time.

That you will include Mulago Hospital in your acknowledgements in all your publications.

Please submit end of study report upon completion of the study.

Yours sincerely;

APPROVED
APPROVAL DATE   EXPIRY DATE
23 SEP 2015   20 SEP 2016
MULAGO RESEARCH ETHICS COMMITTEE
IRC

DR. NAKWAGALA FREDERICK NELSON
CHAIRMAN- MULAGO RESEARCH & ETHICS COMMITTEE.

Vision: "To be the leading centre of Health Care Services"

ETHICAL APPROVAL FROM THE UNCST

Uganda National Council for Science and Technology
(Established by Act of Parliament of the Republic of Uganda)

UNCST

Our Ref: SS 3935   16ᵗʰ November 2015

Dr. Kagawa Mike Nantamu
Makerere University
Kampala

Re: Research Approval: The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda

I am pleased to inform you that on **29/09/2015**, the Uganda National Council for Science and Technology (UNCST) approved the above referenced research project. The Approval of the research project is for the period **29/09/2015** to **29/09/2017**.

Your research registration number with the UNCST is **SS 3935**. Please, cite this number in all your future correspondences with UNCST in respect of the above research project.

As Principal Investigator of the research project, you are responsible for fulfilling the following requirements of approval:
1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the research protocol or the consent form (where applicable) must be submitted to the designated Research Ethics Committee (REC) or Lead Agency for re-review and approval **prior** to the activation of the changes. UNCST must be notified of the approved changes within five working days.
3. For clinical trials, all serious adverse events must be reported promptly to the designated local REC for review with copies to the National Drug Authority.
4. Unexpected events involving risks to research subjects/participants must be reported promptly to the UNCST. New information that becomes available which alters the risk/benefit ratio must be submitted promptly for UNCST review.
5. Only approved study procedures are to be implemented. The UNCST may conduct impromptu audits of all study records.
6. A progress report must be submitted electronically to UNCST within four weeks after every 12 months. Failure to do so may result in termination of the research project.

Below is a list of documents approved with this application:

	Document Title	Language	Version	Version Date
1.	Research proposal	English	N/A	N/A
2.	Informed Consents	English	N/A	N/A
3.	Data Collection Tools	English	N/A	N/A

Yours sincerely,

Hellen. N.Opolot
for: Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

cc. Chair, College of Health Sciences, School of Medicine, Research Ethics Committee

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LOCATION/CORRESPONDENCE   *COMMUNICATION*

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KAMPALA, UGANDA   EMAIL: info@uncst.go.ug
                                                                WEBSITE: http://www.uncst.go.ug

ETHICAL APPROVAL FROM UFS

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA

UFS·UV
HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE

IRB nr 00006240
REC Reference nr 230408-011
IORG0005187
FWA00012784

27 January 2016

DR KAGAWA [DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY, MAKERE UV]
C/O DR MP JAMA
DIVISION OF HEALTH SCIENCES EDUCATION
FACULTY OF HEALTH SCIENCES
UFS

Dear Dr Kagawa

ECUFS NR 174/2015
DR KAGAWA
DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY, MAKERE UV
PROJECT TITLE: THE WORKPLACE AS A TEACHING AND LEARNING ENVIRONMENT FOR UNDERGRADUATE MEDICAL EDUCATION IN UGANDA

1. You are hereby kindly informed that, at the meeting held on 26 January 2016, the Health Sciences Research Ethics Committee (HSREC) approved the following project after all conditions have been met when the signed permission letter from Uganda National Council for Science and Technology was submitted.

    ***Prof Steinberg recused himself from the meeting for the duration of this discussion and decision.*

2. The Committee must be informed of any serious adverse event and/or termination of the study.

3. Any amendment, extension or other modifications to the protocol must be submitted to the HSREC for approval.

4. A progress report should be submitted within one year of approval of long term studies and a final report at completion of both short term and long term studies.

5. Kindly use the ECUFS NR as reference in correspondence to the HSREC Secretariat.

6. The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

Yours faithfully

PROF G JOUBERT
ACTING CHAIR: HEALTH SCIENCES RESEARCH ETHICS COMMITTEE

Cc: Dr MP Jama

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BLOOM'S TAXONOMY LEVELS AND SAMPLE VERBS FOR OPERATIONALISING LEARNING OBJECTIVES

Bloom's taxonomy level	Sample verbs
Knowledge/remember	Define, list, recall, recognise, state, repeat, arrange, match, order, reproduce, replicate
Comprehension/understand	Discuss, describe, explain, translate, restate, report, recognise, distinguish, estimate, indicate, select, sort
Application/apply	Demonstrate, illustrate, perform, interpret, apply, employ, use, practice, prepare, modify, predict, extrapolate, manage, solve, choose
Analysis/analyse	Distinguish, differentiate, calculate, compare, contrast, categorise, appraise, relate, solve, examine, outline
Evaluation/evaluate	Evaluate, assess, justify, appraise, argue, decide, criticise, defend, judge, predict, value
Synthesis/create	Make, propose, design, hypothesise, construct, invent, generate, synthesise, formulate, plan, compose

(Austin, Z. 2016: online)

ADAPTED DREEM QUESTIONNAIRE

The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda

Data Collection Tool 3; Clinical Learning Environment Assessment Tool (Learners)
(Adapted from the *D*undee *R*eady *E*ducation *E*nvironment *M*easure –DREEM)

Please indicate by marking the appropriate box with an **X** whether you; Strongly Agree, Agree, are Uncertain, Disagree or Strongly Disagree with the statements below

Question	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree
Perceptions of Learning					
1. I am encouraged to participate during clinical learning sessions					
2. The clinical teaching is often stimulating					
3. The teaching is interactive between teacher & learner					
4. The teaching helps me to develop my skills					
5. The teaching is well focused					
6. The teaching helps me to develop my confidence					
7. The clinic time is put to good use					
8. The teaching over-emphasizes factual learning					
9. I'm clear about the course learning objectives					
10. The teaching encourages me to participate					
11. Lifelong learning is emphasized over short term learning					
12. The teaching is too teacher-controlled					
Perceptions of Teachers					
13. The lecturers are knowledgeable					
14. The lecturers promote a patient-centered approach to consulting					
15. The lecturers ridicule (make fun of) the learners					
16. The lecturers are authoritarian					
17. The lecturers have good communication skills with patients					
18. The lecturers are good at providing feedback to students					
19. The lecturers provide constructive criticism					
20. The lecturers give good demonstrations					
21. The lecturers get angry during teaching sessions					
22. The lecturers are well-prepared for their classes.					
23. The learners appear to irritate the lecturers					
Academic Self-perception					

24. Learning strategies which worked for me before clinical placements still work for me now					
25. I am confident about my passing this course					
26. I feel I am being well prepared for my profession					
27. The pre-clinical teaching was good preparation for this year's clinical clerkship work					
28. I'm able to practice all I need on the ward					
29. I have learned a lot about empathy in my profession					
30. My problem-solving skills are being well-developed here.					
31. Much of what I have to learn seems relevant to a career in healthcare					
Perceptions of atmosphere					
32. The atmosphere is relaxed during ward teaching					
33. The course is well timetabled					
34. Cheating is a problem in MakCHS					
35. The atmosphere is relaxed during theatre practice					
36. There are opportunities for me to develop interpersonal skills					
37. I feel socially comfortable on the ward					
38. The ward atmosphere allows for return demonstrations					
39. I find the ward experience disappointing					
40. I'm able to concentrate on my skills well					
41. The enjoyment outweighs the stress of the work on the ward					
42. The atmosphere motivates me as a learner					
43. I feel able to ask questions I want					
Social Self-perceptions					
44. There is a good support system for learners on the ward; nurses, doctors & other staff					
45. I am too tired to enjoy the ward work					
46. I am rarely bored during this placement					
47. I have good friends on this ward placement					
48. The places of convenience on the ward are good					
49. I seldom feel lonely in the medical school					
50. The meals at Galloway Hostel are pleasant					

Please make three recommendations for improvement of teaching and learning at the workplace?

    I.   …….

    II.   …….

    III.   …….

THE DELPHI PANEL CHECKLIST

Introduction

- I'm planning to conduct a Delphi study about **the workplace as a teaching and learning environment at Mulago Hospital**. Below is a checklist for potential panelists.

- Kindly take a minute to complete this short checklist assessing your Suitability and Willingness to participate in the subsequent Delphi Study

- Please fill in the space provided or check with an **[X]** to indicate your response

1	Do you teach in a Medical School?	Yes		No				
2	If yes, please specify the name of the medical school and country							
3	Are you a clinical teacher/practicing clinician?	Yes		No				
4	How many years have you been teaching undergraduates?	<5 yrs		>5 yrs				
5	Are you proficient in English (reading and writing)?	Yes		No				
6	What are your academic qualifications?	PhD		M.Med		MBChB		Other, specify	
7	Have you got any training in medical education leading to an award?	Yes		No				
8	If yes in question 7, please indicate your qualification	PhD		Masters		Bachelors		Other, Specify	
9	Are you willing to participate in the survey / answer the questionnaire	Yes		No				
10	Please provide any additional information about your expertise in teaching undergraduate medical students							

DELPHI QUESTIONNAIRE ROUND 1

Study title: THE WORKPLACE AS A TEACHING AND LEARNING ENVIRONMENT FOR UNDERGRADUATE MEDICAL EDUCATION IN UGANDA

<u>Delphi Questionnaire'</u> This Delphi questionnaire is anonymous. You are kindly requested to answer all questions and complete the comment section as best as you can. Please enter your response in the square brackets as indicated [X] or according to the guidance given.

Part A: Demographics   **Participant Initials. _____**

Age (**Please print**)				
Sex/Gender (**please tick**)		Male	Female	
Name of employer/employment e.g. Makerere University				
Name of workplace e.g. **Mulago hospital**				
Duration of employment as a University lecturer – in years (all participating Universities)				
*Duration of employment in a teaching hospital (if applicable) – in years				
Please indicate your qualifications				

*For respondents involved in teaching undergraduates but employed by a teaching hospital and not the university

Part B: Recommendations for improvement of teaching and learning at the workplace

In the table below are recommendations developed from literature, data analysis and suggestions by students, teachers and administrators for improvement of teaching and learning of undergraduates at the workplace. The recommendations have been divided into five (4) broad categories; **bedside teaching and curriculum implementation**, **teaching platforms/workplace learning/clinical placement, faculty development/motivation** and **planning/collaboration/budgeting/procurement**

Definitions:

- **Clinical exposure:** The practice of sending undergraduate medical students during their basic sciences training period (year 1, 2 & 3) to the clinical workplace for orientation and exposure to clinical concepts related to what they have learnt in the basic sciences classes

- **Clinical placement;** one of several rotations at the workplace where the student is allocated for learning clinical skills.

- **Elective sub-specialty placements;** where students can choose between certain sub-specialties to rotate and leave out others during undergraduate training.

- **Blended learning;** integrated teaching and learning at the workplace; wards, clinics, theatre, laboratory, the skills labs, grand rounds, mini rounds with ICT as the backbone.

- **Dual appointments;** Lecturers from the University appointed as honorary consultants and hospital specialists as honorary lecturers

- **Benchmarking;** setting criteria for M&E based on best practices from other teaching and learning environments

- **Unit head;** this is the head/specialist in charge of the unit where the student has been allocated for clinical placement

- **Opportunities for certification;** where students obtain a signature/certificate for participation in learning activities

- **Workplace;** this can be any of the following: **wards, outpatient clinics, the clinical lab, theatre.**

- **SHO;** Senior House Officers/graduate students/Residents

Please enter your response in the square brackets as indicated [X] and add comments in the comment section.

No.	Recommendation	Must have/essential	Good to have/Useful	Unnecessary	Comments
A	**Bedside Teaching and curriculum implementation (18)**				
1	A list of clinical learning activities expected to be covered over the semester should be available to the students.				
2	Certificates of completion of all expected learning activities at each placement should be issued to each student by the **Unit head**				
3	A list of available clinical learning opportunities should be generated by each department/unit/placement				
4	Clinical learning objectives should be aligned with available learning opportunities in form of cases at the clinical placement				
5	**Opportunities for certification** of attendance/signature for clinical learning should be part of scheduled bedside teaching and learning				
6	The skills labs should be used by undergraduates before clinical placements after which skills development should be at the bedside				
7	Students in their final year should be allowed to clerk, write and make treatment recommendations in the patients' files				
8	Senior teachers/researchers /professors should provide patient care services at the workplace as good role models				
9	The minimum number of procedures supervised by specialist before continued learning from SHOs & other preceptors should be stated				
10	Several clinicians should take on small numbers of students on the ward round and meet at some point for a joint discussion				
11	**MOST** bedside sessions during clinical placement should be condition/system specific rather than opportunistic teaching sessions				

12	Whenever there is more than one specialist at the workplace, one of them should be dedicated to opportunistic bedside teaching sessions				
13	Teaching ward rounds should be separated from major ward rounds in order to ensure adequate teaching and adequate patient care				
14	Availability of non-academic medical officers at the workplace would ease on the workload for specialists to concentrate on teaching of students				
15	Classroom sessions during clinical years should be limited to a few overview lectures with more time allowed for bedside teaching				
16	Teaching of undergraduates by graduate students (SHO) should be made mandatory with log entries for the SHO after each teaching session				
17	There should be management protocols for all common conditions in order to standardize teaching for the undergraduate students				
18	There should be an evaluation mechanism of teachers by the students during clinical placements				
B	**Teaching platforms/workplace learning/clinical placement (15)**				
19	**Clinical exposure** starting in year-one is a good concept that should be strengthened by designating a dept. coordinator & orienting all teachers				
20	Clinical exposure sessions should match with the concepts being taught at that moment in the basic sciences				
21	Basic science teachers with clinical backgrounds should participate in the clinical exposure sessions at the clinical workplace				
22	Students' duty rooms should be provided on wards for undergraduates to participate in night duties during their clinical placements				
23	Student clinical placements should be full time in each department (avoid timetabling that requires students in more than one place)				
24	**Elective sub-specialty placements** should be encouraged to create more time to be spent in each of the selected sub-specialty.				
25	Clinical exposure should include orientation to department-specific skills in history taking, physical examinations, procedures and investigations.				
26	The University should establish a University Teaching Hospital where everything would be dedicated to teaching and learning				

27	Teaching sites (satellite hospitals/general hospitals) for undergraduates should be established outside super-specialised hospitals				
28	More time should be spent teaching undergraduates from out-patients' departments (OPD); Medical OPD, Surgical OPD, ANC, Gyn OPD, etc.				
29	Parts of a super-specialised hospital should be designated into general wards (not specialised) for optimal undergraduate learning				
30	Wards should have dedicated side rooms for discussion of critical cases/details (risk factors, prognosis, differentials) for deeper learning.				
31	There should be an accreditation system for all teaching and learning environments (teaching hospitals) for medical education				
32	There is need to design new criteria for admission to medical school such as pre-entry exams to improve on the quality of undergraduate students				
33	University admissions should be commensurate, in the long term, with the facilities for workplace learning during clinical placement				
C	**Faculty Development/Motivation (9)**				
34	To harmonise expectations and commitment, teaching staff from the university and the teaching hospital should have **dual appointments.**				
35	All clinical teachers should be oriented on how to balance the needs of the learner, the patient, the teacher and the clinical workplace.				
36	Regular monitoring and evaluation of the teaching and learning environment should be done through **benchmarking**				
37	Regular meetings on how to improve workplace learning should be held between specialists', lecturers & administrators from the two institutions.				
38	Opportunities for lecturers to train in super specialized areas should be provided by the University for a better workplace teaching of students				
39	Professional and ethical conduct as well as how to give feedback should form part of faculty development sessions				
40	To support learning, all hospital staff should be oriented on the importance of students' participation in ward activities				
41	Clinical teaching should contribute significantly to the requirements for promotion and career development for clinical teachers				

42	There is need to establish a Medical Education/Student Support Centre to promote / coordinate excellence in teaching & learning				
D	**Planning/collaboration Budgeting/Procurement (8)**				
43	The University needs to play a bigger role in providing learning aids on the wards for clinical training of undergraduates				
44	The contribution made by the University towards workplace learning should be in form of equipment and not consumables				
45	The hospital should function as a teaching hospital by procuring materials and equipment that add value to teaching and learning				
46	Students should purchase their own learning aids such as stethoscope, patellar hammers, fetoscopes, as a requirement for clinical placement.				
47	There should be equipment and supplies provided by the University on the different wards designated exclusively for students' use.				
48	Collaborative teams should be established between the University and the hospital to identify and drive research agenda				
49	Staff appraisals should include an evaluation of the dual responsibility of patient care and student learning regardless of employer				
50	Joint meetings should be arranged to discuss how to share resources on locally generated funds such as research grants and private patients				

Thank you for your time and commitment to completing this questionnaire. We value your time and look forward to sharing with you the results of this survey for further refinement of the suggestions for improvement of teaching and learning at the workplace.

Dr Mike N. Kagawa

For and on behalf of the research team

CONSENT INFORMATION FOR THE DELPHI QUESTIONNAIRE

Information Document and Consent Form for the Delphi Study

Dear Colleague/Respondent

I'm currently conducting a research on the suitability of the workplace at Mulago National Referral and Teaching Hospital as a Teaching and Learning Environment and whether it fulfills the requirements of the curriculum for undergraduate medical students of Makerere University College of Health Sciences. The title of the study is **"The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda."**

As part of the study one of my objectives is to develop recommendations for efficient teaching and learning at the workplace for undergraduate students in health sciences education using a Delphi study. Because of your experience in teaching and learning at the workplace in your institution, you have been identified as an expert in medical education and a resourceful person who can provide valuable information in this area. Your input in the study is valuable to us as your responses may help us improve teaching and learning at the workplace for undergraduate medical students and I appreciate your willingness and time to assist with this research.

You are therefore kindly requested to participate in this research study using the Delphi technique. You will receive the first round questionnaire for the Delphi process by email. The questionnaire was developed after conducting key informant interviews with administrators and lecturers as well as focus group discussions with undergraduate students of Makerere University College of Health Sciences and Mulago National Referral and Teaching Hospital. From these, several recommendations were made and listed under various subheadings in the Delphi questionnaire. These recommendations are envisaged to form the basis of a model for improvement of teaching and learning at the workplace. The statements in the questionnaire provide you with an opportunity to offer an opinion on their relative importance.

Procedure of the Delphi Process

Your opinion as a participant is sought on the relative importance of each recommendation listed in the survey. All information provided and opinions offered will be treated as strictly confidential. Please note that no respondent will know the identity of any other respondent. Only the researcher and his supervisors will have this knowledge. Please ensure that you keep all information pertaining to this research and questionnaire strictly confidential, both in this and subsequent rounds of the Delphi process, as the research process may be thus contaminated. After each round feedback will be provided to the participants. Please note that by completing the questionnaire, you are voluntarily agreeing to participate in the research study.

Please answer all questions in all sections; Please complete the questionnaire as follows

Each statement must be evaluated in respect of its importance as a recommendation that must be included in a model for the workplace as a teaching and learning environment.

Please indicate your opinion on the three-point Likert scale provided.

These points are as follows:

1 = **Must have** (This recommendation must **DEFINITELY BE INCLUDED** in the model)

2 = **Good to have** (This recommendation **CAN BE INCLUDED** in the model)

3 = **Unnecessary** (This recommendation must **DEFINITELY BE EXCLUDED** from the model)

If possible, please complete the questionnaire in its electronic form. If, however, you prefer to print it out and complete it in paper format, please feel free to do so. In both cases please answer all the points by placing an **X (in black ink)** over or next to the specific number of your choice in the scale provided with each statement. Space is also provided for additional suggestions and comments.
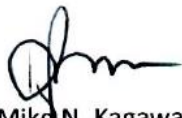
The questionnaire in this round should take approximately 30 - 45 minutes of your time. Please contact me if you have any questions or uncertainties on Tel. +256 77 2449613, Email; kagawanm@yahoo.com

Please return the filled-out questionnaires within 10 days. Because we appreciate your busy schedule, you will be sent kind reminders every three days so as not to forget. The analysis can only be done once all questionnaires are received back, so your cooperation with regards to the deadline is greatly appreciated. You may withdraw from the study at any given moment during the completion of the questionnaire although you are kindly requested to complete it. The results may be published.

You may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, University of the Free State on Telephone number +27 51 4052812 or the Chairperson, Makerere University College of Health Sciences Higher Degrees Research and Ethics Committee, Assoc. Prof Ponsiano Ocama on Tel. +256772421190, email ponsiano.ocama@gmail.com

Thank you in anticipation

Yours sincerely

Dr Mike N. Kagawa

MAKERERE UNIVERSITY
SCHOOL OF MEDICINE
APPROVED
VALID UNTIL
★ **2 0 SEP 2017** ★
RESEARCH & ETHICS COMMITTEE
P.O.BOX 7072, KAMPALA

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Co-Promoter 2

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Dept of Paediatrics & CH

College of Health Sciences

Makerere University

DELPHI ROUND ONE - LETTER OF FEEDBACK

FEEDBACK FOR DELPHI ROUND ONE: RECOMMENDATIONS FOR IMPROVEMENT OF TEACHING AND LEARNING AT THE WORKPLACE AT MAKERERE UNIVERSITY COLLEGE OF HEALTH SCIENCES

Dear colleagues,

I want to take this opportunity to thank you for having taken time to complete the Delphi survey that I sent you. I'm sharing with you the results of the first round of the Delphi survey and the purpose of this feedback is to provide you with the results and information regarding the first round. **You do not need to do anything with the results I'm sharing now.** A second round will be sent to you shortly.

Various studies have put consensus in Delphi studies at anywhere between 51% to 80% (Avella, 2016:305, Giannarou, 2014:65; Penciner R. et al., 2013:24). For purposes of this study, consensus was put at 70% for round one, meaning that if $\geq$ 70% of all participants agreed that a particular recommendation was a **Must have/Essential**, consensus was deemed to have been achieved and this would be suggested as a recommendation for adoption in attempting to improve the workplace as a teaching and learning environment.

In this Delphi survey, out of 50 recommendations that were part of round one, consensus was reached on 24. These 24 will be removed from round two, and only the remaining statements will be left for your consideration in the next round.

In the feedback questionnaire which I'm sharing with you now and which you are **NOT** expected to complete, you will notice that all the recommendations where consensus was reached have been highlighted with light grey. Some comments from the other participants have also been included.

Because of the degree of consensus reached so far, round two, which will reach you shortly will be much shorter.

Kind regards

Mike N. Kagawa

Dr. Mike N. Kagawa

MBChB (Mak), MMed-Obs

PhD student

DELPHI ROUND 1, FEEDBACK WITH COMMENTS FROM PARTICIPANTS

<u>Study title:</u> **THE WORKPLACE AS A TEACHING AND LEARNING ENVIRONMENT FOR UNDERGRADUATE MEDICAL EDUCATION IN UGANDA**

<u>Delphi Questionnaire:</u> This Delphi questionnaire is anonymous and you are requested not to discuss your responses with anyone. Participant anonymity is one of the strengths of the Delphi technique. Below are some of the comments from the rest of the panellists.

NB: No part of this questionnaire may be copied, stored in a retrievable format for re-use or used without consent from the author.

Part A: Demographics

Part B: Recommendations for improvement of teaching and learning at the workplace

> The recommendations have been divided into four (4) broad categories; **bedside teaching and curriculum implementation**, **teaching platforms/workplace learning/clinical placement, faculty development/motivation** and **planning/collaboration/budgeting/procurement**
> Definitions:
> - **Clinical exposure:** The practice of sending undergraduate medical students during their basic sciences training period (year 1, 2 & 3) to the clinical workplace for orientation and exposure to clinical concepts related to what they have learnt in the basic sciences classes
> - **Clinical placement;** one of several rotations at the workplace where the student is allocated for learning clinical skills.
> - **Elective sub-specialty placements;** where students can choose between certain sub-specialties to rotate and leave out others during undergraduate training.
> - **Blended learning;** integrated teaching and learning at the workplace; wards, clinics, theatre, laboratory, the skills labs, grand rounds, mini rounds with ICT as the backbone.
> - **Dual appointments;** Lecturers from the University appointed as honorary consultants and hospital specialists as honorary lecturers
> - **Benchmarking;** setting criteria for M&E based on best practices from other teaching and learning environments
> - **Unit head;** this is the head/specialist in charge of the unit where the student has been allocated for clinical placement
> - **Opportunities for certification;** where students obtain a signature/certificate for participation in learning activities
> - **Workplace;** this can be any of the following: **wards, outpatient clinics, the clinical lab, theatre.**
> - **SHO;** Senior House Officers/graduate students/Residents
>
> Please enter your response in the square brackets as indicated [X] and add comments in the comment section.

No.	Recommendation	Must have/essential	Good to have/Useful	Unnecessary	Comments
A	**Bedside Teaching and curriculum implementation (18)**				
1	A list of clinical learning activities expected to be covered over the semester should be available to the students.				This is good for standardizing learning and ensuring key areas are covered
2	Certificates of completion of all expected learning activities at each placement should be issued to each student by the **Unit head**				Some respondents questioned if there still is a role for logbooks as students tend to forge them. And who should keep the logs; teacher or student. Should the certificates be a pre-requisite for sitting exams?
3	A list of available clinical learning opportunities should be generated by each department/unit/placement				This list would ideally take into account case variety / load / severity
4	Clinical learning objectives should be aligned with available learning opportunities in form of cases at the clinical placement				In a specialised hospital, the challenge is that undergraduates may see only complex cases
5	**Opportunities for certification** of attendance/signature for clinical learning should be part of scheduled bedside teaching and learning				This should take into account the expected competence level; observer/assistant/participant
6	The skills labs should be used by undergraduates before clinical placements after which skills development should be at the bedside				Skills labs help students practice in a safe environment to minimise risk to patients but some believe students should be

					exposed to real life situations since there are enough patients to learn from
7	Students in their final year should be allowed to clerk, write and make treatment recommendations in the patients' files				The major concern was whether they should write prescriptions /treatment in the file and the medico-legal implications
8	Senior teachers/researchers /professors should provide patient care services at the workplace as good role models				This is good for motivation and role modeling for students and junior colleagues
9	The minimum number of procedures supervised by specialist before continued learning from SHOs & other preceptors should be stated				This is good for standardizing learning
10	Several clinicians should take on small numbers of students on the ward round and meet at some point for a joint discussion				This would encourage individual appraisal but interferes with teamwork which is hallmark of clinical care
11	**MOST** bedside sessions during clinical placement should be condition/system specific rather than opportunistic teaching sessions				Encourages teacher & learner preparation but the teaching of common conditions that occur commonly may be curtailed
12	Whenever there is more than one specialist at the workplace, one of them should be dedicated to opportunistic bedside teaching sessions				Maybe the dedicated teacher would do scheduled teaching and minimise opportunistic learning
13	Teaching ward rounds should be separated from major ward rounds in order to ensure adequate teaching and adequate patient care				This requires increased staff but may discourage the spirit of teamwork
14	Availability of non-academic medical officers at the workplace would ease on the workload for specialists to concentrate on teaching of students				Non-academic medical officers meant that they are not involved in teaching but clinical care. Other panelists felt that this cadre is irrelevant in a teaching hospital
15	Classroom sessions during clinical years should be limited to a few overview lectures with more time allowed for bedside teaching				Classroom sessions may be necessary to teach difficult clinical concepts and rare clinical conditions

16	Teaching of undergraduates by graduate students (SHO) should be made mandatory with log entries for the SHO after each teaching session				This may help the residents (SHOs) to consolidate their knowledge
17	There should be management protocols for all common conditions in order to standardize teaching for the undergraduate students				While it may standardize practice, it may be restrictive in a teaching & research institution where students should be taught to be reflective thinkers
18	There should be an evaluation mechanisms of teachers by the students during clinical placements				This may need to be anonymous. Learning objectives should be clear and comments should be discussed between the teacher and a senior colleague
B	**Teaching platforms/workplace learning/clinical placement (15)**				
19	**Clinical exposure** starting in year-one is a good concept that should be strengthened by designating a dept. coordinator & orienting all teachers				There should be some form of assessment attached **to Clinical exposure** sessions to encourage participation; assessment drives learning
20	Clinical exposure sessions should match with the concepts being taught at that moment in the basic sciences				Promotes learning in context at an early stage
21	Basic science teachers with clinical backgrounds should participate in the clinical exposure sessions at the clinical workplace				Would it be easier to have more clinicians teaching basic sciences and then have the students at their clinical workplace
22	Students' duty rooms should be provided on wards for undergraduates to participate in night duties during their clinical placements				The students' hostel (Galloway) should be returned to its original purpose
23	Student clinical placements should be full time in each department (avoid timetabling that requires students in more than one place)				It has been quite destabilizing as students did not seem to be focused in their learning
24	**Elective sub-specialty placements** should be encouraged to create more time to be spent in each of the selected sub-specialty.				This may require lengthening the course duration
25	Clinical exposure should include orientation to department-specific skills in history taking, physical examinations, procedures and investigations.				This is a basic concept for any clinical discipline

26	The University should establish a University Teaching Hospital where everything would be dedicated to teaching and learning				University hospitals usually offer cutting edge care backed by research but is it sustainable?
27	Teaching sites (satellite hospitals/general hospitals) for undergraduates should be established outside super-specialised hospitals				Some think that although it is a good idea, this could pose medico-legal challenges
28	More time should be spent teaching undergraduates from out-patients' departments (OPD); Medical OPD, Surgical OPD, ANC, Gyn OPD, etc.				This would improve their diagnostic acumen but would depend on where they are likely to practice after training; hospitals of PHC facilities
29	Parts of a super-specialised hospital should be designated into general wards (not specialised) for optimal undergraduate learning				This would also require that teachers are not highly specialised too, is it feasible
30	Wards should have dedicated side rooms for discussion of critical cases/details (risk factors, prognosis, differentials) for deeper learning.				This is good for patient confidentiality and is a good bridge between the ward and the classroom
31	There should be an accreditation system for all teaching and learning environments (teaching hospitals) for medical education				It is very good for quality assurance of the graduates from all training institutions and should be at regular intervals
32	There is need to design new criteria for admission to medical school such as pre-entry exams to improve on the quality of undergraduate students				Pre-entry exams may still favor a select few but may be entry to medical school should be after another science degree-the American way
33	University admissions should be commensurate, in the long term, with the facilities for workplace learning during clinical placement				Helps to ensure adequate clinical exposure. Discussions about this harmonization should be held at the highest level – Ministerial meetings'
C	**Faculty Development/Motivation (9)**				
34	To harmonise expectations and commitment, teaching staff from the university and the teaching hospital should have **dual appointments.**				Roles, expectations and benefits should be clearly laid down

35	All clinical teachers should be oriented on how to balance the needs of the learner, the patient, the teacher and the clinical workplace.				Should be part of faculty development sessions
36	Regular monitoring and evaluation of the teaching and learning environment should be done through **benchmarking**				Can this be a source of demotivation if targets are set too high?
37	Regular meetings on how to improve workplace learning should be held between specialists', lecturers & administrators from the two institutions.				This is commonplace but the administrators are missing from the meetings
38	Opportunities for lecturers to train in super specialized areas should be provided by the University for a better workplace teaching of students				Either institution can support staff from the other but isn't this happening?
39	Professional and ethical conduct as well as how to give feedback should form part of faculty development sessions				There is need for faculty development in many medical education areas
40	To support learning, all hospital staff should be oriented on the importance of students' participation in ward activities				Makes students feel welcome and ready to participate in all learning activities
41	Clinical teaching should contribute significantly to the requirements for promotion and career development for clinical teachers				Prioritising research at the expense of clinical teaching is not good for undergraduate learning
42	There is need to establish a Medical Education/Student Support Centre to promote / coordinate excellence in teaching & learning				Could also provide social support & counseling
D	**Planning/collaboration Budgeting/Procurement (8)**				
43	The University needs to play a bigger role in providing learning aids on the wards for clinical training of undergraduates				There is urgent need for learning aides at the workplace
44	The contribution made by the University towards workplace learning should be in form of equipment and not consumables				Could be done through dialogue and make an in-kind contribution or monetary contribution and let the hospital decide
45	The hospital should function as a teaching hospital by procuring materials and equipment that add value to teaching and learning				Hopefully the MOU is explicit on contribution from each side

46	Students should purchase their own learning aids such as stethoscope, patellar hammers, fetoscopes, as a requirement for clinical placement.				It may encourage students to be responsible and would own them after training.
47	There should be equipment and supplies provided by the University on the different wards designated exclusively for students' use.				It is good but it may be difficult to draw the line between teaching and patient care
48	Collaborative teams should be established between the University and the hospital to identify and drive research agenda				Research should be driven by clinical service goals and not external demands
49	Staff appraisals should include an evaluation of the dual responsibility of patient care and student learning regardless of employer				There is need for clarity of expectations by all employees and supervisors
50	Joint meetings should be arranged to discuss how to share resources on locally generated funds such as research grants and private patients				More issues to be discussed should include other issues such as teaching, assessment

Thank you for your time and commitment to completing this questionnaire.

Dr. Mike N. Kagawa

For and on behalf of the research team

FEEDBACK FOR DELPHI ROUND TWO: RECOMMENDATIONS FOR IMPROVEMENT OF TEACHING AND LEARNING AT THE WORKPLACE AT MAKERERE UNIVERSITY COLLEGE OF HEALTH SCIENCES

Dear colleagues,

Thank you once again for having spared your precious time to complete the second round of the Delphi survey that I sent you. I'm sharing with you the results of round 2 of the Delphi survey to provide you with information. **You do not need to do anything with the questionnaire and results I'm sharing now except read and internalise.**

As previously stated, various studies have put consensus in Delphi studies at anywhere between 51% to 80% (Avella, 2016:305, Giannarou, 2014:65; Penciner R. et al., 2013:24). For purposes of this study, consensus was put at 70% for round one. This has been maintained for round two. What it means is that when $\geq$ 70% of all respondents agree that a particular item in the questionnaire is a **Must have/Essential**, consensus is deemed to have been achieved. We can then suggest that as a recommendation for adoption in order to improve teaching and learning at the workplace.

In this second round, out of the items that remained from the first round, consensus was reached on 2 statements and these will be removed from the next round. The statements where consensus was reached have been highlighted with light blue in the accompanying document. Some Comments from the other respondents have also been included for your perusal. The statements where there is no consensus yet, will remain for your consideration in the third and last round. I'm kindly requesting you to read and internalize the comments from this round (round 2) so that you take a final position in the final round.

The feedback questionnaire which I'm sharing with you now is for information purposes only and you are **NOT** expected to complete it.

The third and final round will be much shorter and I beg your indulgence to complete it on time when it comes.

Kind regards

Mike N. Kagawa

Dr. Mike N. Kagawa

MBChB (Mak), MMed-Obs

PhD student (Health Professions Education), University of the Free State, RSA

DELPHI ROUND 2, FEEDBACK WITH COMMENTS FROM PARTICIPANTS

<u>**Study title:**</u> **The workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda**

<u>**Delphi Questionnaire'**</u> Below are comments from some respondents who participated in **round 2** of the Delphi questionnaire (**the last column on the extreme right**). I'm sharing the comments with all the respondents so that you read the views of the other respondents. Some of you maintained your position as stated in **round 1** and that was fine. Others changed their minds and that is also fine. After all, the purpose of this exercise is **consensus building** on what will be best for teaching and learning at the workplace. The sections highlighted in light blue indicate statements where consensus was achieved on this second round (over 69% of all respondents agree that it is a must have/essential recommendation).

I'm sharing these results with you for purposes of information sharing and you are not expected to do anything except read and internalize. I will be sending you the third and final round shortly (**round 3**). Please use the information shared here when completing the final round that will definitely be **much much** shorter. I'm begging your indulgence to complete round 3, on time, for me when it comes.

Part B: Recommendations for improvement of teaching and learning at the workplace

No.	Recommendation	Must have/essential	Good to have/Useful	Unnecessary	Comments from respondents
A	**Bedside Teaching and curriculum implementation (14)**				
2	Certificates of completion of all expected learning activities at each placement should be issued to each student by the **Unit head**				It is good for quality assurance to ensure coverage of content Ideally this should be a requirement before summative assessment. It is known as a Certificate of due Performance (CODP) This could be in form of a summary of the logbooks to minimise bulk of paper. But it may give the impression that the learning process has ended which is dangerous. It may also overburden the unit heads
3	A list of available clinical learning opportunities should be generated by each department/unit/placement				This is an important list that clearly states what to expect but should be comprehensive with all levels of complexity; classical, typical and atypical. IT should be availed to all teachers and learners so as to exploit these opportunities to the maximum. Helps to monitor coverage by the teachers and feedback from the learners
4	Clinical learning objectives should be aligned with available learning opportunities in form of cases at the clinical placement				This is the ideal and helps to know if the learning objectives will be met but not always the case. There may be conditions that are unavailable but students need to learn them. May limit creativity
5	**Opportunities for certification** of attendance /signature for clinical learning should be part of scheduled bedside teaching and learning				A good idea but sometimes the focus shifts more to signatures and less on learning. Should be accompanied by assessment and proper

					feedback aimed at improvement. It helps to keep track of students' progress Other methods of motivation other than policing should be adopted. It is documentation that learning has taken place
6	The skills labs should be used by undergraduates before clinical placements after which skills development should be at the bedside				A mixed model approach would be better but the preceptors in the skills labs should be seasoned clinicians. But why the models when we have enough clinical material; models and dummies are an influence from the West where the culture is different The skills lab provides a safe learning environment where if mistakes are made (and they will always be made) by the learner, the consequences (like death of a baby after failed resuscitation) are not very traumatic to the learner
7	Students in their final year should be allowed to clerk, write and make treatment recommendations in the patients' files				Builds confidence and a sense of responsibility but there will need to be counter-signatures by seniors because this is a medicolegal document, and the nurses need to be sensitized about it. Some feel strongly that the student should have his/her clerkship notebook which can be evaluated by the teachers but if they are to clerk in the patients' files, they should indicate clearly their names and year of study
9	The minimum number of procedures supervised by specialist before continued learning from SHOs & other preceptors should be stated				May be the clinician should be the last to see the student after the juniors and in a way, assesses the juniors also
10	Several clinicians should take on small numbers of students on the ward round and meet at some point for a joint discussion				Having one teacher for the whole group standardises the skills but there is need for balance with clinical care. In case of subdivisions, there should be a joint conference after the round with all the teachers and students. The ward is primarily for patient care by a TEAM of health professionals. Small numbers of

					students can be taught on a specially organized teaching activity
11	**MOST** bedside sessions during clinical placement should be condition/system specific rather than opportunistic teaching sessions				It ensures that key areas are covered. As long as it is based on available pts and how they present but some conditions appear very rarely. There is need for flexibility to allow teachers to innovate during teaching. Opportunistic enables appreciation of complexity
12	Whenever there is more than one specialist at the workplace, one of them should be dedicated to opportunistic bedside teaching sessions				Ensures students interest are covered but should be on a rotational basis. Opportunistic teaching means there may be no objectives and evaluation of learning becomes problematic
13	Teaching ward rounds should be separated from major ward rounds in order to ensure adequate teaching and adequate patient care				There should be a difference between a MAJOR ward round and a teaching ward round and both need to be planned for. Use a hybrid model so students can also attend clinical ward round otherwise it breaks down the fraternity between clinicians and lecturers. The emphasis for students should however be on learning. Teaching and clinical care should be integrated
14	Availability of non-academic medical officers at the workplace would ease on the workload for specialists to concentrate on teaching of students				They would deal with pts that do not require specialist attention. The specialist should perform patient care and teaching and not divorce the two It is very difficult to talk of non-teaching in a teaching hospital; everybody should teach. MO become redundant in the presence of SHOs
15	Classroom sessions during clinical years should be limited to a few overview lectures with more time allowed for bedside teaching				Medicine has clinical theory component, laboratory component and community components which may have to be taught away from the bedside to create better grounding. The theory could however be taught using online resources
16	Teaching of undergraduates by graduate students (SHO) should be made mandatory with log entries for the SHO after each teaching session				This is part of their preparation for future practice as teachers and the teachers getting ready to exit but should be within limits; at least 2-3 sessions a week that are moderated by a senior and then the teachers take the rest. Assessment of efforts and feedback by teachers should be included

B	Teaching platforms/workplace learning/clinical placement (9)				
19	**Clinical exposure** starting in year-one is a good concept that should be strengthened by designating a dept. coordinator & orienting all teachers				Helps the young students to appreciate the calling they have entered but teacher acceptance is necessary. Could be started in year 2 but should be part of medical training. Requires input from basic science teachers and clinicians
19a	There should be assessment attached to clinical exposure sessions to encourage learning				Lack of assessment has led to complacency on both sides; teachers and learners. Assessment will make the students realise its importance. Assessment drives learning Added by Kagawa NM
20	Clinical exposure sessions should match with the concepts being taught at that moment in the basic sciences				
21	Basic science teachers with clinical backgrounds should participate in the clinical exposure sessions at the clinical workplace				The numbers may not be adequate to do all this but clinicians can participate in teaching basic sciences and then receive the students on the wards
22	Students' duty rooms should be provided on wards for undergraduates to participate in night duties during their clinical placements				Students should be on the wards and not in the duty rooms as they encourage laziness. They may not have to stay the whole night but till late and then go to prepare for the next day. But there is a hostel-Galloway- which was for that purpose. It should revert to it's role
24	**Elective sub-specialty placements** should be encouraged to create more time to be spent in each of the selected sub-specialty.				Not very appropriate for undergraduates and time may not allow, better for graduate students
26	The University should establish a University Teaching Hospital where everything would be dedicated to teaching and learning				There may still be management challenges and may create an artificial atmosphere not applicable after qualification leading to academicians at the expense of clinicians It would also provide cutting edge clinical care, and many other health services such as preventive, promotive, palliative and research, so no one loses
27	Teaching sites (satellite hospitals/general hospitals) for undergraduates should be established outside super-specialised hospitals				This is very important for learning primary health care as these are the majority of the cases they will meet when they qualify. The current setting is creating baby specialists

28	More time should be spent teaching undergraduates from out-patients' departments (OPD); Medical OPD, Surgical OPD, ANC, Gyn OPD, etc.				Students should learn from both In and Out patients as they will encounter them during their practice as medical officers and patient care is a continuum but OPD helps improve diagnostic skills as they see patients as they come in
29	Parts of a super-specialised hospital should be designated into general wards (not specialised) for optimal undergraduate learning				There may be space constraints. Students should have general hospital rotations outside the specialised hospital
C	**Faculty Development/Motivation (1)**				
38	Opportunities for lecturers to train in super specialized areas should be provided by the University for a better workplace teaching of students				Very important. Fellowships and PhD opportunities for both institutions. But teachers of undergraduates don't have to be highly specilaised
D	**Planning /budgeting /procurement/collaboration (2)**				
44	The contribution made by the University towards workplace learning should be in form of equipment and not consumables				There may be need for MOH & MOES to agree on terms but consumables are better off from the hospital. The university needs to participate in all ways possible; equipment and supplies and plan together. The important thing is to ensure a conducive learning environment There is need for a good MOU
46	Students should purchase their own learning aids such as stethoscope, patellar hammers, fetoscopes, as a requirement for clinical placement.				This is the way to go as they will own their equipment but these items should be standardised. But some students can hardly afford a meal and yet some equipment are expensive. The university should procure such equipment as fetoscopes, ophthalmoscopes, auroscopes etc

Thank you for your time and commitment to completing this questionnaire. We value your time and look forward to sharing with you the results of this survey as we seek to improve of teaching and learning at the workplace.

Dr Mike N. Kagawa, For and on behalf of the research team

DELPHI ROUND 3, CONSENSUS STATEMENTS WITH COMMENTS

Study title: **The workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda**
Delphi Questionnaire This is the **THIRD** and **FINAL** round of this Delphi questionnaire.
The statements where consensus was achieved are highlighted in light blue and the aggregated comments from the respondents are indicated in the comment section.

Part B: Recommendations for improvement of teaching and learning at the workplace

No.	Recommendation	Must have/essential	Good to have/Useful	Unnecessary	Comments
A	**Bedside Teaching and curriculum implementation (12)**				
2	Certificates of completion of all expected learning activities at each placement should be issued to each student by the **Unit head**	[ ]	[X]	[ ]	Important for M&E as accountability Not necessary, and not immune to forgery. May just be additional paperwork for nothing
3	A list of available clinical learning opportunities should be generated by each department/unit/placement	[X]	[ ]	[ ]	Should also include faculty responsible and learners distributed properly. Improves learner efficiency as they have targets
4	Clinical learning objectives should be aligned with available learning opportunities in form of cases at the clinical placement	[ ]	[ ]	[ ]	True as common things occur commonly but overall learning objectives should be based on the curriculum and learning opportunities sought from other learning platforms so as not to be so restrictive
6	The skills labs should be used by undergraduates before clinical placements after which skills development should be at the bedside	[ ]	[ ]	[ ]	Slabs allow students to practice in a safe environment but clinicians should participate and assessment done. No need for skills labs as we have enough pts. Skills lab is a western culture with no suitable willing pts and not all medical schools have SLabs
9	The minimum number of procedures supervised by specialist before continued learning from SHOs & other preceptors should be stated	[ ]	[ ]	[ ]	No need for minimum but seniors should be available at all times to supervise after giving the theoretical concepts. The challenge may be access to cases
10	Several clinicians should take on small numbers of students on the ward round and meet at some point for a joint discussion	[ ]	[ ]	[ ]	Students should attend ward rounds with all specialists and have variety of skills as even teachers teach one another. Special sessions by one lecturer can be arranged.

11	**MOST** bedside sessions during clinical placement should be condition/system specific rather than opportunistic teaching sessions	[ ]	[X]	[ ]	Not always possible especially for rare diseases. Opportunistic teaching still has a role.
12	Whenever there is more than one specialist at the workplace, one of them should be dedicated to opportunistic bedside teaching sessions	[ ]	[ ]	[ ]	Opportunistic teaching should be minimised but dedicating faculty will ensure adequate coverage of content
13	Teaching ward rounds should be separated from major ward rounds in order to ensure adequate teaching and adequate patient care	[ ]	[ ]	[ ]	The true major ward round has a lot to offer to learners as the whole group of caregivers are present to discuss and manage the patient. All ward rounds should be used for teaching. Medical education and clinical service should occur in the same setting
14	Availability of non-academic medical officers at the workplace would ease on the workload for specialists to concentrate on teaching of students	[ ]	[ ]	[ ]	No, everybody working in the 'garage' should assist the apprentice to learn on the job. Specialists are not for teaching only and medical officers may not be as committed or diligent
15	Classroom sessions during clinical years should be limited to a few overview lectures with more time allowed for bedside teaching	[ ]	[ ]	[ ]	They cannot be done away with completely, there is need for balancing
16	Teaching of undergraduates by graduate students (SHO) should be made mandatory with log entries for the SHO after each teaching session	[X]	[ ]	[ ]	No need for logs, they are prone to forgery. All doctors should be teachers and it is good for peer learning with all its benefits. But they should be mentored well in order for them to teach undergrads and allowed time to read too. Helps them to learn
B	**Teaching platforms/workplace learning/clinical placement (9)**				
19	**Clinical exposure** starting in year-one is a good concept that should be strengthened by designating a dept. coordinator & orienting all teachers	[ ]	[ ]	[ ]	So that students can see real pts instead of cadavers. It makes interpretation /application of concepts easier. Clarity on expectations is needed
19a	There should be assessment attached to clinical exposure sessions to encourage learning	[ ]	[ ]	[ ]	Assessment drives learning but may take away the excitement. May be attendance register Added by Kagawa NM
20	Clinical exposure sessions should match with the concepts being taught at that moment in the basic sciences	[ ]	[ ]	[ ]	This is context-based learning but can be challenging to this integration
21	Basic science teachers with clinical backgrounds should participate in the clinical exposure sessions at the clinical workplace	[ ]	[ ]	[ ]	Most clinicians can handle the clinical exposure sessions

22	Students' duty rooms should be provided on wards for undergraduates to participate in night duties during their clinical placements	[ ]	[ ]	[ ]	Yes, for clinical students. But there could be a dedicated hostel for clinical students near the hospital
24	**Elective sub-specialty placements** should be encouraged to create more time to be spent in each of the selected sub-specialty.	[ ]	[ ]	[ ]	Let's look at the E in the SPICES model and encourage electives
26	The University should establish a University Teaching Hospital where everything would be dedicated to teaching and learning	[ ]	[ ]	[ ]	This may be the way to go to produce cutting edge health care, research and collaboration locally and regionally but may require a public-private partnership
27	Teaching sites (satellite hospitals/general hospitals) for undergraduates should be established outside super-specialised hospitals	[X]	[ ]	[ ]	May be the equivalent of a University Teaching Hospital but provides opportunity for greater and respectful exposure to patients.
28	More time should be spent teaching undergraduates from out-patients' departments (OPD); Medical OPD, Surgical OPD, ANC, Gyn OPD, etc.	[ ]	[ ]	[ ]	Balance time spent at each learning point. Could be done as part of community exposure at HCIVs
29	Parts of a super-specialised hospital should be designated into general wards (not specialised) for optimal undergraduate learning	[ ]	[ ]	[ ]	May be challenging to manage as with other health services and it ceases to be super-specialised
C	**Faculty Development/Motivation (1)**				
38	Opportunities for lecturers to train in super specialized areas should be provided by the University for a better workplace teaching of students	[X]	[ ]	[ ]	Teachers of undergraduates should be taught how to teach before thinking of super-specialisation
D	**Planning /budgeting /procurement/collaboration (2)**				
44	The contribution made by the University towards workplace learning should be in form of equipment and not consumables	[ ]	[ ]	[ ]	The important thing is to work out the unit cost of training a medical student and then have all line ministries come together and procure things together
46	Students should purchase their own learning aids such as stethoscope, patellar hammers, fetoscopes, as a requirement for clinical placement.	[ ]	[ ]	[ ]	Most students are poor but they could purchase some personal equipment esp if they are stated as a requirement at admission to the course

Thank you for your time and commitment to completing this questionnaire. We value your time and look forward to sharing with you the results of this survey for further refinement of the suggestions for improvement of teaching and learning at the workplace.

Dr Mike N. Kagawa
For and on behalf of the research team

DETAILS OF THE CONSENSUS SCORES FOR EACH STATEMENT AND DELPHI ROUND (GREEN = ≥70% CONSENSUS)

Statement		Round (R) score								
		Must have / Essential			Good to have / Useful			Unnecessary		
A	**Bedside Teaching and curriculum implementation (18)**	R1	R2	R3	R1	R2	R3	R1	R2	R3
1	A list of clinical learning activities expected to be covered over the semester should be available to the students.	100								
2	Certificates of completion of all expected learning activities at each placement should be issued to each student by the **Unit head**	53.3	40.0	60.0	40.0	40.0	26.7	6.7	20.0	13.3
3	A list of available clinical learning opportunities should be generated by each department/unit/placement	66.7	66.7	80.0	33.3	33.3	20.0	0.0	0.0	0.0
4	Clinical learning objectives should be aligned with available learning opportunities in form of cases at the clinical placement	66.7	53.3	66.7	33.3	33.3	33.3	0.0	13.3	0.0
5	**Opportunities for certification** of attendance/signature for clinical learning should be part of scheduled bedside teaching and learning	66.7	73.3		20.0	13.3		13.3	13.3	
6	The skills labs should be used by undergraduates before clinical placements after which skills development should be at the bedside	40.0	60.0	53.3	40.0	33.3	46.7	20.0	6.7	0.0
7	Students in their final year should be allowed to clerk, write and make treatment recommendations in the patients' files	66.7	73.3		13.3	13.3		20.0	13.3	
8	Senior teachers/researchers /professors should provide patient care services at the workplace as good role models	93.3			6.7			0.0		
9	The minimum number of procedures supervised by specialist before continued learning from SHOs & other preceptors should be stated	57.1	53.3	53.3	35.7	26.7	40.0	7.1	20	6.7
10	Several clinicians should take on small numbers of students on the ward round and meet at some point for a joint discussion	66.7	46.7	53.3	20.0	40.0	46.7	13.3	13.3	0.0
11	**MOST** bedside sessions during clinical placement should be condition/system specific rather than opportunistic teaching sessions	33.3	46.7	26.7	46.7	26.7	60.0	20.0	26.7	13.3
12	Whenever there is more than one specialist at the workplace, one of them should be dedicated to opportunistic bedside teaching sessions	46.7	40.0	46.7	40.0	33.3	46.7	13.3	26.7	6.7
13	Teaching ward rounds should be separated from major ward rounds	46.7	46.7	53.3	40.0	40.0	33.3	13.3	13.3	13.3

#	Statement									
	in order to ensure adequate teaching and adequate patient care									
14	Availability of non-academic medical officers at the workplace would ease on the workload for specialists to concentrate on teaching of students	40.0	33.3	40.0	26.7	26.7	40.0	33.3	40.0	20.0
15	Classroom sessions during clinical years should be limited to a few overview lectures with more time allowed for bedside teaching	53.3	66.7	66.7	46.7	26.7	26.7	0.0	6.7	6.7
16	Teaching of undergraduates by graduate students (SHO) should be made mandatory with log entries for the SHO after each teaching session	66.7	66.7	73.3	33.3	33.3	20.0	0.0	0.0	6.7
17	There should be management protocols for all common conditions in order to standardize teaching for the undergraduate students	73.3			26.7			0.0		
18	There should be an evaluation mechanism of teachers by the students during clinical placements	73.3			20.0			6.7		
B	**Teaching platforms/workplace learning/clinical placement (15)**									
19	**Clinical exposure** starting in year-one is a good concept that should be strengthened by designating a dept. coordinator & orienting all teachers	53.3	46.7	46.7	40.0	33.3	33.3	6.7	20.0	20.0
19b	There should be assessment attached to clinical exposure sessions to encourage learning *(added after Round 1 by researcher)*		60.0	60.0		26.7	26.7		13.3	13.3
20	Clinical exposure sessions should match with the concepts being taught at that moment in the basic sciences	60.0	46.7	46.7	40.0	33.3	40.0	0.0	20.0	13.3
21	Basic science teachers with clinical backgrounds should participate in the clinical exposure sessions at the clinical workplace	66.7	57.1	40.0	26.7	7.1	46.7	6.7	35.7	13.3
22	Students' duty rooms should be provided on wards for undergraduates to participate in night duties during their clinical placements	66.7	53.3	60.0	20.0	26.7	33.3	13.3	20.0	6.7
23	Student clinical placements should be full time in each department (avoid timetabling that requires students in more than one place)	80.0			20.0			0.0		
24	**Elective sub-specialty placements** should be encouraged to create more time to be spent in each of the selected sub-specialty.	53.3	60.0	33.3	40.0	26.7	60.0	6.7	13.3	6.7
25	Clinical exposure should include orientation to department-specific skills in history taking, physical examinations, procedures and investigations.	73.3			20.0			6.7		
26	The University should establish a University Teaching Hospital where everything would be dedicated to teaching and learning	60.0	53.3	53.3	40.0	40.0	40.0	0.0	6.7	6.7
27	Teaching sites (satellite hospitals/general hospitals) for undergraduates should be	60.0	66.7	86.7	26.7	33.3	13.3	13.3	0.0	0.0

#	Statement									
	established outside super-specialised hospitals									
28	More time should be spent teaching undergraduates from out-patients' departments (OPD); Medical OPD, Surgical OPD, ANC, Gyn OPD, etc.	46.7	40.0	26.7	46.7	13.3	60.0	6.7	46.7	13.3
29	Parts of a super-specialised hospital should be designated into general wards (not specialised) for optimal undergraduate learning	60	66.7	46.7	26.7	13.3	33.3	13.3	20.0	20.0
30	Wards should have dedicated side rooms for discussion of critical cases/details (risk factors, prognosis, differentials) for deeper learning.	86.7			13.3			0.0		
31	There should be an accreditation system for all teaching and learning environments (teaching hospitals) for medical education	93.3			6.7			0.0		
32	There is need to design new criteria for admission to medical school such as pre-entry exams to improve on the quality of undergraduate students	80.0			13.3			6.7		
33	University admissions should be commensurate, in the long term, with the facilities for workplace learning during clinical placement	93.3			6.7			0.0		
C	**Faculty Development/Motivation (9)**									
34	To harmonise expectations and commitment, teaching staff from the university and the teaching hospital should have **dual appointments.**	73.3			20.0			6.7		
35	All clinical teachers should be oriented on how to balance the needs of the learner, the patient, the teacher and the clinical workplace.	100			0.0			0.0		
36	Regular monitoring and evaluation of the teaching and learning environment should be done through **benchmarking**	86.7			13.3			0.0		
37	Regular meetings on how to improve workplace learning should be held between specialists', lecturers & administrators from the two institutions.	86.7			13.3			0.0		
38	Opportunities for lecturers to train in super specialized areas should be provided by the University for a better workplace teaching of students	66.7	60.0	73.3	33.3	33.3	26.7	0.0	6.7	0.0
39	Professional and ethical conduct as well as how to give feedback should form part of faculty development sessions	93.3			6.7			0.0		
40	To support learning, all hospital staff should be oriented on the importance of students' participation in ward activities	93.3			6.7			0.0		
41	Clinical teaching should contribute significantly to the requirements for promotion and career development for clinical teachers	80.0			20.0			0.0		

#									
42	There is need to establish a Medical Education/Student Support Centre to promote / coordinate excellence in teaching & learning	80.0			7.1			7.1		
D	**Planning/collaboration Budgeting/Procurement (8)**									
43	The University needs to play a bigger role in providing learning aids on the wards for clinical training of undergraduates	93.3			6.7			0.0		
44	The contribution made by the University towards workplace learning should be in form of equipment and not consumables	66.7	26.7	40.0	33.3	60.0	53.3	0.0	13.3	6.7
45	The hospital should function as a teaching hospital by procuring materials and equipment that add value to teaching and learning	73.3			26.7			0.0		
46	Students should purchase their own learning aids such as stethoscope, patellar hammers, fetoscopes, as a requirement for clinical placement.	66.7	53.3	66.7	20.0	33.3	26.7	13.3	13.3	6.7
47	There should be equipment and supplies provided by the University on the different wards designated exclusively for students' use.	73.3			20.0			6.7		
48	Collaborative teams should be established between the University and the hospital to identify and drive research agenda	85.7			14.3			0.0		
49	Staff appraisals should include an evaluation of the dual responsibility of patient care and student learning regardless of employer	86.7			13.3			0.0		
50	Joint meetings should be arranged to discuss how to share resources on locally generated funds such as research grants and private patients	80.0			20.0			0.0		

Declaration

25 January 2018

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1   PhD Thesis: The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda

I confirm that I edited this thesis and checked the references. The student accepted or rejected recommendations for changes.

HS Human

Hettie Human
WRITER | EDITOR | TRANSLATOR | INTERPRETER

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30 January 2018

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Yours sincerely

Dr MP Jama
Promoter
Head: Division Student Learning and Development
University of the Free State

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YUNIVESITHI YA FREISTATA

The Workplace as a Teaching and Learning Environment for Undergraduate Medical Education in Uganda

by

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Student number 2014130567

Thesis Submitted in Fulfillment of the requirements for the award of the Degree of

Philosophiae Doctor in Health Professions Education (Ph.D. HPE)

In the

Division Health Sciences Education,

Faculty of Health Sciences

at the University of the Free Sate

Jan 2018

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